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LLOYD & CO

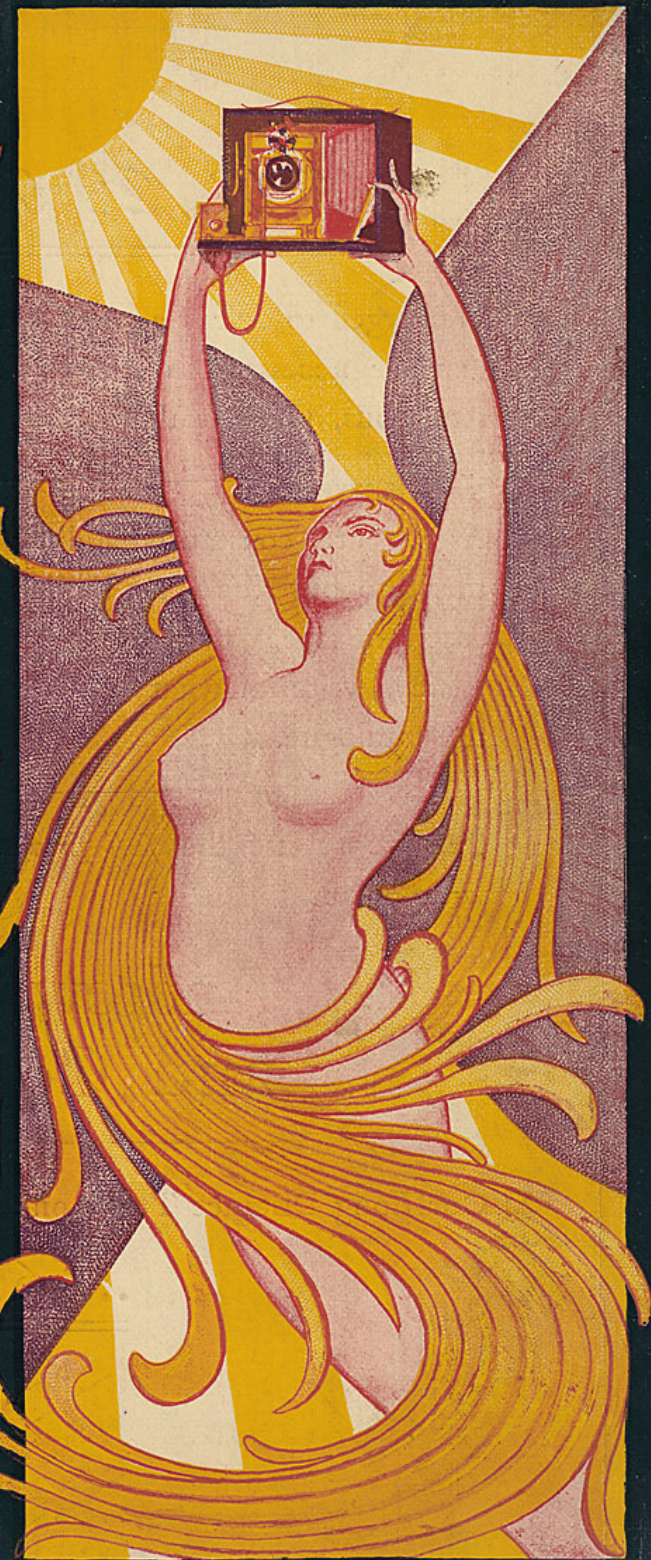


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1

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State how goods are to be sent, by mail, express, or freight.

If by mail, add enough to catalogue prices to pay for postage.

If no instructions are given, we will ship according to our best judgment.

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PHOTOGRAPHIC LENSES.

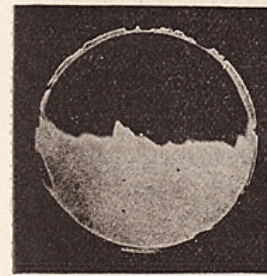
In selecting a lens or any other optical apparatus, the construction and working value cannot be competently judged except by an expert. Practically, a purchaser's only safeguard is confidence that the dealer is competent to judge and to criticize properly the manufacturer's work, and that the dealer's reputation is of more value to him than the sale of a lens. Many serious defects may exist in a lens, impossible to detect by visual test alone.

In order to demonstrate more fully the helplessness of the average purchaser in respect to the detection of errors in lenses from a casual examination, we reproduce some photographs of lenses in which these various errors exist, and which are not visible to the naked eye, but which are painfully apparent to the scrutinizing eye of the camera. The glass from which the Bausch & Lomb lenses are made is obtained from the best glass makers of the world, German, French, English, the justly famous Jena glass preponderating. The rough glass is tested in every instance before any work is done upon it, so that the foundation may be perfect in the beginning. The first step in the making of a lens consists in roughly outlining the dimensions of the lens from a piece of glass which has first been fastened to a suitable tool to enable the workman to hold it. These partly formed lenses are then given to the skilled grinder, who forms the surface to the exact curvature required by the optical formula from which he works, testing the work at each step with a steel gauge, to insure its accuracy. The system of testing at every stage of the work, and the delicate tests which are rigidly applied, are the chief elements in maintaining the uniformly high grade of photographic lenses. The lens, having been given the correct form and thickness, is ready for polishing, the final process, in which the highest skill and care are required, and which determines whether the finished objective shall give brilliant pictures or flat ones; whether it shall be slower than its ratio of focus to aperture indicates it should be, or have its normal speed; and whether it will retain its speed and brilliancy, or gradually lose them. The accuracy of the polished surface is determined by means of the test-glass, which is a plate of hard glass, one surface of which has an absolutely perfect curvature corresponding to that required in the optical formula of the lens. The surface of the finished lens is fitted into this test plate, and, if perfectly true, a uniform color will appear over the entire surface. A variation of $\frac{1}{500,000}$ of an inch is instantly detected by this test, and a variation of more than $\frac{1}{500,000}$ in the curvature is not permitted. The tests for thickness, freedom from

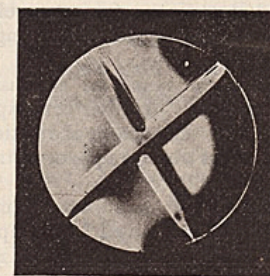
scratches, striae, etc., are equally severe; and the testing is not omitted during any process, but is continued until the lenses have been cemented together to form systems, and the systems have been placed in the mounts.

The finished objectives are allowed to season for a time, and are then retested, to determine whether any strains have been introduced, or changes have taken place in the cement or mounting of the lens. The necessity of this critical testing at every stage is demonstrated by the fact that a variation of $\frac{1}{1,000}$ of an inch in the thickness of some lenses greatly impairs the definition of the objective in which it is used, and that the slightest variation in the thickness of the film of cement between the lenses, the slightest decentring or too tight mounting in the cell, will produce the same results; and yet such an objective might readily be imposed upon an unsuspecting purchaser, only to be glaringly apparent later.

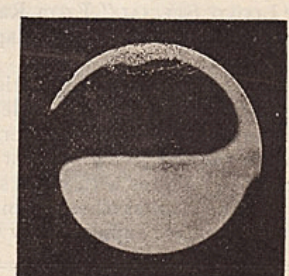
The above describes the system of manufacture and of test employed by the Bausch & Lomb Optical Company, whose lenses we believe to be the best that can be obtained. The fact that we are constantly in communication with parties desiring lenses for all sorts of purposes, and that we have a long list of satisfied purchasers, is abundant evidence not only of the merits of the lenses themselves, but of the value of our expert acquaintance with them.



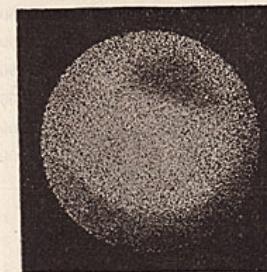
Effect of strain in cement. Undetectable except by special test.



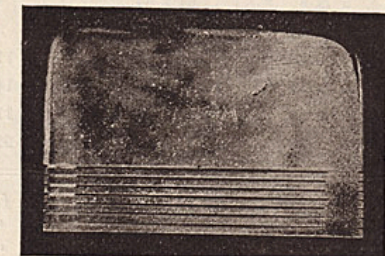
Cross striation, from defective polishing. Not visible to the unaided eye.



Effect of minute crack in cement, such as would escape ordinary examination.

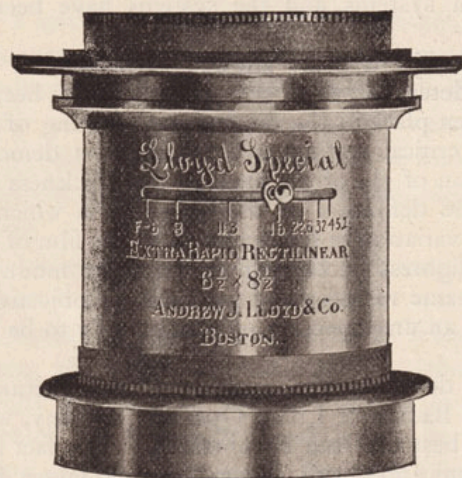


Pit marks in defectively polished lens. Not visible to unaided eye.



Slab of optical glass partly sawed into strips from which lenses are cut.

Lloyd "Special"



Extra Rapid Rectilinear Lens.

The growing demand for our "LLOYD SPECIAL LENS" proves the superior quality of lenses constructed on our formulæ. As we are anxious to meet the full requirements of the professional and amateur photographer, we introduced the "LLOYD SPECIAL" Extra Rapid Rectilinear, for extremely rapid work in the studio and field, and especially adapted for groups and standing figures where distance is limited.

The lenses of this series are the result of exhaustive calculations, and are constructed of carefully selected glass. Are perfectly aplanatic. Their peculiarly accurate correction for spherical and chromatic aberration permits the use of large stops, thereby giving brilliant portraits and groups, or obtaining fully exposed instantaneous pictures with rapid shutters.

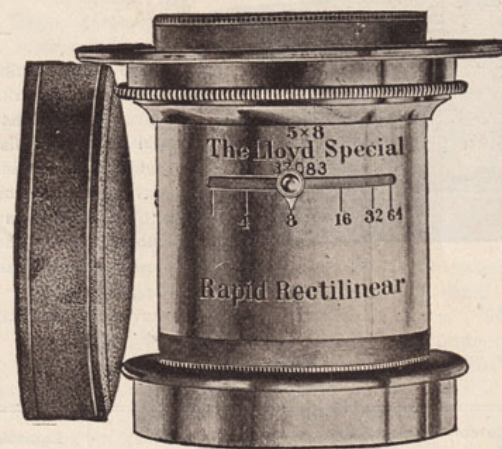
The smaller sizes are invaluable for use in hand camera work. They are supplied only with our Improved Iris Diaphragm.

No.	Size Plate, Portrait Group.	Size Plate, Landscape.	Equivalent Focus.	Back Focus.	Price.
A	4 x 5 in.	5 x 7 in.	6 1/4 in.	5 1/4 in.	\$17.50
B	5 x 8 "	6 1/2 x 8 1/2 "	8 "	7 "	22.50
C	6 1/2 x 8 1/2 "	8 x 10 "	9 1/8 "	8 1/4 "	28.50
D	8 x 10 "	10 x 12 "	11 "	9 3/4 "	38.50
E	10 x 12 "	11 x 14 "	14 "	12 1/4 "	52.00
F	12 x 15 "	14 x 17 "	17 "	15 1/4 "	70.00
G	16 x 20 "	18 x 22 "	22 "	19 1/4 "	90.00

C.	Approximate required distance for standing cabinet figure,	13 ft.
D.	" " " " " " " "	16 "
E.	" " " " " " " "	20 "

For vignette only half of these distances required.

The "Lloyd Special" Rapid Rectilinear



For Instantaneous Outdoor Work, Groups, and Standing Figures in the Studio.

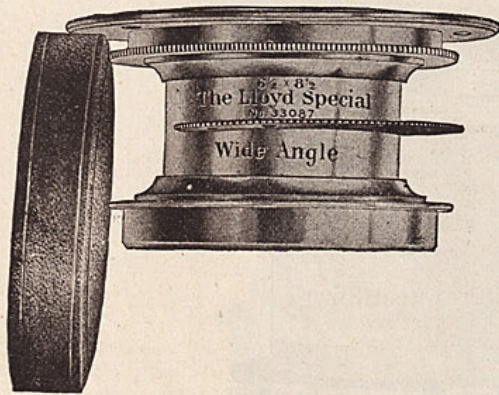
These lenses are of the rapid rectilinear symmetrical type. They have unusual crispness of definition, great covering capacity, and depth. The speed will be found ample for all ordinary lighted studios and for instantaneous outdoor work. Nos. C and D will be found valuable lenses for cabinets and small groups.

No.	Diameter of Lens.	Size of Plate for Portraits and Groups.	Size of Plate for Views with Small Stop.	Equivalent Focus.	Price with Iris Diaphragms.
A	1 in.	4 x 5 in.	5 x 7 in.	6 in.	\$12.50
B	1 1/8 "	5 x 8 "	6 1/2 x 8 1/2 "	9 "	17.50
C	1 1/4 "	6 1/2 x 8 1/2 "	8 x 10 "	11 "	22.00
D	2 "	8 x 10 "	10 x 12 "	13 1/4 "	27.50
E	2 1/8 "	10 x 12 "	11 x 14 "	17 "	37.00
F	2 1/2 "	12 x 15 "	14 x 17 "	19 1/4 "	53.00
G	3 1/4 "	16 x 20 "	18 x 22 "	24 "	70.00
H	3 3/4 "	18 x 22 "	20 x 24 "	31 "	90.00

B.	Approximate required distance for standing cabinet figure,	13 ft.
C.	" " " " " " " "	16 "
D.	" " " " " " " "	21 "

For vignette only half of these distances required.

The "Lloyd Special" Wide Angle Lenses



Give fine results in interior and architectural work. The larger stops give an abundance of time to allow their use with flash light exposures and outdoor instantaneous work under favorable conditions.

We quote them working with large stops, and in another column with small stops, in each case giving the angular aperture which the lenses have on each specified plate.

No.	Size of Plate covered with Large Stop. Angle 90°.	Size of Plate covered with Small Stop. Angle 100°.	Back Focus.	Equivalent Focus.	Price.
A	4 x 5 in.	5 x 7 in.	3 $\frac{1}{4}$ in.	3 $\frac{1}{2}$ in.	\$9.50
B	5 x 8 "	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	14.00
C	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$ "	8 x 10 "	6 $\frac{1}{5}$ "	6 $\frac{1}{2}$ "	17.00
D	8 x 10 "	10 x 12 "	7 $\frac{1}{2}$ "	8 "	21.00
E	11 x 14 "	14 x 17 "	9 $\frac{1}{5}$ "	10 $\frac{1}{4}$ "	26.00
F	14 x 17 "	16 x 18 "	13 $\frac{1}{3}$ "	14 "	33.00
G	16 x 20 "	18 x 22 "	16 "	17 "	42.00
H	20 x 24 "	24 x 24 "	20 $\frac{1}{4}$ "	22 "	55.00

Lloyd's Single Achromatic Lenses.

These lenses are carefully made up of a positive crown and negative flint glass lens. They give the best possible spherical correction of this construction, and make the photographic image coincident with the ground glass.

They are also supplied in neat brass mountings, nicely finished and lacquered, which are provided with revolving diaphragms and morocco cap.

No.	Size of Plate.	Diameter of Lens.	Focus.	Price Unmounted.	Telegraphic Code.	Price Mounted.	Telegraphic Code.
1	3 $\frac{1}{4}$ x 4 $\frac{1}{2}$ in.	1 $\frac{1}{8}$ in.	5 $\frac{1}{2}$ in.	\$1.20	Singe.	\$2.75	Simia.
2	4 x 5 "	1 $\frac{1}{4}$ "	6 $\frac{1}{4}$ "	1.50	Sinker.	3.00	Simil.
3	5 x 8 "	1 $\frac{1}{2}$ "	9 "	2.00	Sinter.	4.50	Simoon.
4	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	11 "	2.50	Sineus.	6.00	Simper.
5	8 x 10 "	1 $\frac{7}{8}$ "	13 "	2.50	Sinure.	7.00	Simu.

Zeiss Anastigmat Lenses.

Invention of Dr. P. Rudolph.

These lenses, invented by Dr. P. Rudolph of the firm of Carl Zeiss, Jena, from whom we have secured the exclusive right to manufacture them in America, under American patents, have marked an epoch in the construction of photographic lenses. Their optical advantages are so pronounced that they were immediately recognized, and are to-day generally accepted as the standard photographic lenses.

Imitations.

Like all meritorious articles, they were followed by imitations, but it is self-evident that the knowledge and ability which originated this type of lens must forge ahead of all imitators, no matter how strenuous their efforts. This truth is exemplified in the fact that "Zeiss Anastigmat" is the synonym for the "Best photographic lenses in existence."

Material and Specifications Direct from Zeiss.

The patentees have supplied us with the exact specifications for their construction, and keep us fully informed as to all improvements and the construction of new types. The high quality of these lenses exacts the most critical methods of workmanship in the various processes of manufacture and in the final tests. However, our long experience in the production of precise optical work, the painstaking care which is used, and the systematic control of work at each step of manufacture enable us to produce lenses possessing in the highest degree the superior optical properties appertaining to this improved construction.

Points of Superiority.

The advantages of the Zeiss Anastigmat Lenses are: *The perfect correction of astigmatism*, astigmatism being a defect inherent in all the older types of lenses and even in some "anastigmat" lenses

of other makers.

The proper correction of axial and marginal rays, and the *exact coincidence and equal magnitude of the visual and chemical images* giving sharply defined pictures over the entire plate, *reproducing straight lines* as such and *retaining the definition* with all stops, whichever may have been used to obtain the focus.

There is *no flare spot or ghost* to impair the brilliancy of the image, even when used under dazzling light.

The definition being perfect even with large apertures, as a result of the elimination of astigmatism and of curvature of the image, lenses of shorter focus for a given sized plate may be used, giving greater depth of focus, wide angle, and making the lens itself more compact.

Not Symmetrical.

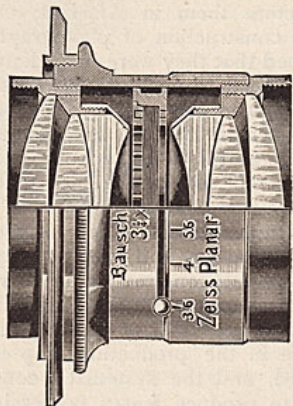
The Zeiss Anastigmats, except Series VIIa, are not symmetrical lenses in the sense that either of the combinations composing them may be used separately for photographic purposes, as it is impossible without the use of an additional set of elements to produce a single combination which will give satisfactory results.

If one will but give the claims made for lenses of symmetrical construction a moment's consideration, their fallacy will be recognized. Almost all lenses, except for studio and technical purposes, are at present used on folding hand cameras where compactness is the first consideration. In such cameras there is not sufficient bellows extension to permit the use of the rear combination of these lenses, as the focus is much longer than in the anastigmats covering the same plate. Furthermore, the results obtainable are far from satisfactory, as such single combinations not only require microscopic stops to secure definition, but are even then not at all rectilinear.

The Zeiss Anastigmat Lenses are the nearest approach to the ideal universal lens.

BAUSCH & LOMB-ZEISS PLANAR LENS, SERIES Ia.

SPEED f-3.6

Figure shows the $3\frac{1}{4} \times 4\frac{1}{4}$ Series Ia Lens actual size.

Description. These objectives are composed of two systems, the outer element of each being a single collective lens, and the inner composed of two dispersive lenses, having approximately the same refractive, but different dispersive power. On account of their extreme rapidity and the consequent large size of the lenses, the planars are somewhat heavier than the other anastigmats.

Optical Properties. These lenses reach the extreme limit of rapidity, the speed varying from f-3.6 in the smaller and medium sizes to f-5 in the larger sizes. The angle of the image circle is 72 degrees, of which 50 degrees are utilized on the small plates for which the lenses are rated. The Planars are superior in precision of defining power to any of the other anastigmats. In fact, the results obtainable are such as to leave nothing further to be desired.

Application. In this lens the photo-engraver will find that which he has looked in vain for in other lenses, viz., a lens which will give a reproduction equal to the copy, from same size down to the smallest reduction. They possess in

Photo-Engraving. addition great speed, making them time savers, not only in giving the best work, but with very short exposure.

For those difficult and peculiar classes of instantaneous photography where speed is the imperative quality, the Planar will be found a great improvement over the extra rapid lenses of other types heretofore used, as they have speed equal to that of the fastest portrait lenses, and at the same time a covering power which the others have not. For making kinemograph and other negatives for the projection of animated pictures, these lenses are particularly well adapted, the smaller sizes having the requisite depth of focus and speed.

Ultra Rapid Instantaneous Photography.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Planar Lenses.

SERIES Ia.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Largest Stop.* Inches.	Equivalent Focus. Inches.	Diameter of Lens. Inches.	Speed.	Angle. Deg.	Price. Lens Only.†
<i>Plagium</i>	9	2½ x 3½	4½	1½	f-3.6	70	\$ 53 00
<i>Plakoid</i>	10	3½ x 3½	5	1½	f-3.8	70	63 00
<i>Planeta</i>	11	3½ x 4½	6½	1¾	f-3.8	70	77 00
<i>Planum</i>	12	4½ x 6½	8	2	f-4.	65	109 00
<i>Plasma</i>	13	5 x 8	10	2½	f-4.	65	150 00
<i>Plastic</i>	14	6½ x 8½	12	2¾	f-4.2	62	192 00
<i>Plastron</i>	15	7 x 9	14½	3½	f-4.5	72	241 00
<i>Plata</i>	16	8 x 10	16½	3¾	f-4.5	72	300 00
<i>Platanno</i>	17	10 x 12	18½	3¾	f-5.	68	349 00
<i>Platinid</i>	18	12 x 16	24	4¾	f-5.	68	698 00

* The next larger plate is well covered with intermediate stop.

† Nos. 9, 10, 11, and 12 only can be fitted with Iris Diaphragm Shutter.

Sizes larger or smaller than listed above will be made to order if desired.

When ordering lenses fitted with shutter by telegraph, specify *Diaphragm* in addition to the code word for the size of the lens.

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES II.

SPEED f-6.3

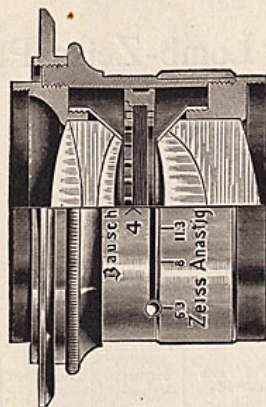


Figure shows 4 x 5 Series II Lens actual size.

Description. The front system of these objectives is composed of two and the back system of three lenses. As the systems are necessarily quite large, on account of the large aperture, the lens as a whole is somewhat heavy; the mounts, however, are reduced in weight in every practical way. The Iris Diaphragm shutter may be fitted to all sizes up to and including the $6\frac{1}{2} \times 8\frac{1}{2}$. The sizes larger than $6\frac{1}{2} \times 8\frac{1}{2}$ have an aperture greater than the largest opening of the shutter, hence, if fitted with a shutter, the speed would be reduced. Special shutters must therefore be used on these larger sizes.

Optical Properties. The speed of this series is f-6.3. Being one of the most rapid of the anastigmats, they are particularly adapted for the fastest instantaneous exposures, ordinarily rapid instantaneous work on cloudy days, in shaded situations, and in the studio.

The full angle of the field is 85 degrees, of which 46 degrees are utilized on the plates for which the respective sizes are rated. The anastigmatic and spherical corrections are of a very high order, especially considering the speed and angle.

Application. Where a lens is to be selected solely on account of great speed, and where the VIIa is too expensive, this lens will be found the best of all anastigmats.

They possess a further advantage, that they may be used for all ordinary purposes by reducing the speed (aperture), thus giving the same covering power and depth of focus which other lenses working under the same conditions have.

The Series II lenses are especially desirable for the studio on account of their great speed combined with optical qualities which enable the photographer to place sitters for groups in any desired position, and does not confine them to the usual semi-circular arrangement in order to secure equal definition and size of figures.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Anastigmat Lenses. SERIES II.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-9.* Inches.	Equivalent Focus. Inches.	Free Diameter of Largest Lens. Inches.	Price.	
					Lens Only.	When Fitted with Diaphragm Shutter.
<i>Zaffer</i>	1	$2\frac{1}{4} \times 3\frac{1}{4}$	$3\frac{1}{8}$	$\frac{3}{8}$	\$ 30 00	\$ 45 00
<i>Zany</i>	2	$3\frac{1}{4} \times 4\frac{1}{4}$	$4\frac{1}{8}$	$\frac{3}{4}$	33 50	48 50
<i>Zealous</i>	3	4×5	$5\frac{1}{8}$	1	40 50	55 50
<i>Zedoary</i>	4	$4\frac{1}{4} \times 6\frac{1}{4}$	$6\frac{1}{8}$	$1\frac{1}{8}$	51 00	66 00
<i>Zephyr</i>	5	5×7	$8\frac{1}{8}$	$1\frac{1}{4}$	64 50	80 50
<i>Zigzag</i>	6	5×8	$9\frac{1}{8}$	$1\frac{3}{8}$	78 50	96 00
<i>Zinc</i>	7	$6\frac{1}{2} \times 8\frac{1}{2}$	$11\frac{1}{8}$	2	108 50	126 00
<i>Zincky</i>	8	8×10	$14\frac{1}{8}$	$2\frac{3}{8}$	150 00	
<i>Zodiac</i>	9	10×12	$16\frac{1}{8}$	$2\frac{1}{2}$	192 00	
<i>Zone</i>	10	11×14	$20\frac{1}{8}$	$3\frac{1}{8}$	240 50	
<i>Zoology</i>	11	12×15	$23\frac{1}{8}$	$3\frac{1}{4}$	300 00	

* The next larger plate is well covered with small stop.

Price for matching two lenses for stereoscopic work, \$3.00.

For sizes of flanges, see page 66.

Special sizes of Series II lenses, either larger or smaller than listed above, are made to order only. Prices on application.

When ordering shutters fitted to lenses, by telegraph, specify *Diaphragm* in addition to the code word for the size of lens.

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES IIa.

SPEED f-8

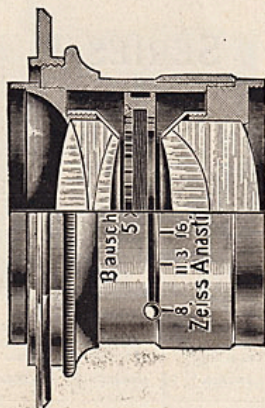


Figure shows the 5 x 7 Series IIa Lens actual size.

Description. The front system of these objectives is composed of two and the back system of three lenses, special Jena glass being used. The two systems have a greater separation than in the other anastigmat lenses, and therefore admit the application of the Iris Diaphragm shutter, as well as the Unicum and other shutters which operate between the lenses, to the smaller sizes. The mountings are extremely neat and compact.

Optical Properties. These lenses have a speed of f-8 and give ample illumination under unfavorable circumstances. The anastigmatic and spherical corrections are not equaled in any other lens, except the Series VIIa. They have therefore unequalled covering power, reproducing the minutest detail without the necessity of reducing the aperture, and rendering straight lines at all angles and in all parts of the field as such. They have an angular field of 75 degrees, 60 degrees of which are utilized on the plates for which the various sizes are rated. The focus of each lens of the series is shorter for the plate for which it is rated, than can be employed with other lenses, thus giving greater depth of focus and angle.

Application. On account of their superior optical qualities, short focus, the compactness of the mounting, and the applicability of shutters to them, the smaller numbers are better suited for use with hand cameras than any other lenses, excepting only the Series VIIa. This is also true regarding all the sizes when used for tripod cameras. In fact, they are the best of all the Zeiss Anastigmats where one lens only is to serve for all kinds of work.

In a well lighted studio they are suited for portraits of heads and full figures on account of their depth of focus and for groups, as they do not require the proverbial semi-circular arrangement in order to secure definition and equal size of all figures.

Severe and practical tests have shown the Series IIa lenses to be well suited for copying, on account of faultless reproduction of detail, flatness of the field, and the capacity to copy straight lines at all angles. They are in everyday use by a large number of photo-engravers.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Anastigmat Lenses. SERIES IIa.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-8.* Inches.	Equivalent Focus. Inches.	Free Diameter of Largest Lens. Inches.	Price.	
					Lens Only.	When Fitted with Diaphragm Shutter.
<i>Zaba</i>	1	4 x 5	4 $\frac{3}{8}$	$\frac{3}{8}$	\$ 30 00	\$ 45 00
<i>Zaccho</i>	2	4 $\frac{1}{2}$ x 6 $\frac{1}{2}$	5 $\frac{3}{8}$	$\frac{3}{4}$	33 50	48 50
<i>Zapha</i>	3	5 x 8	6 $\frac{1}{2}$	1	44 00	59 00
<i>Zamia</i>	4	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$	8	1 $\frac{3}{8}$	54 50	69 50
<i>Zapote</i>	5	8 x 10	9 $\frac{3}{8}$	1 $\frac{7}{8}$	64 50	80 50
<i>Zarmich</i>	6	10 x 12	11 $\frac{3}{8}$	1 $\frac{3}{4}$	85 50	103 00
<i>Zax</i>	7	11 x 14	13 $\frac{3}{8}$	2	125 50	143 00
<i>Zayah</i>	8	14 x 17	17	2 $\frac{3}{8}$	160 50	

* The next larger plate is well covered with small stop.

Price for matching two lenses for stereoscopic work, \$3.00.

See page 66 for sizes of flanges.

Special sizes of the Series IIa lenses, either larger or smaller than listed above, will be made to order only. Prices on application.

When ordering shutters fitted to lenses, by telegraph, specify *Diaphragm* in addition to the code word for the size of lens.

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES III.

SPEED f-7.2

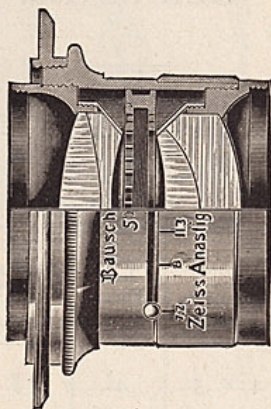


Figure represents the 5 x 7 Series III Lens actual size.

Description. The front system of these objectives is composed of two and the back system of two lenses, not, however, of symmetrical construction. This is the original type of the anastigmat lenses, and embodies the principles of correction on which the anastigmats are founded. They are of simpler construction than the Series II and IIa.

Optical Properties. The speed of this series is f-7.2. The anastigmatic corrections are not quite equal to the Series IIa and IIIa, but the speed being greater, it meets the requirements for a lens between the Series II and the IIa and IIIa.

The field embraces an angle of 85 degrees, about 50 degrees of which are intercepted by the plate for which the special sizes are rated.

Application. The Series III lenses being less in price than the Series II and IIa, and still spherically and anastigmatically well corrected, are often preferred to the latter, as they are sufficiently rapid for nearly all **General Photography.** instantaneous work.

They are particularly adapted for portraiture and for photographing **Studio.** groups, as they do not require the proverbial semi-circular arrangement, and for single figures give roundness with excellent definition.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Anastigmat Lenses.

SERIES III.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-7.2.* Inches.	Equivalent Focus. Inches.	Free Diameter of Largest Lens. Inches.	Price.	
					Lens Only.	When Fitted with Diaphragm Shutter.
<i>Zumic</i>	1	3½ x 4½	3½	⅝	\$ 24 50	\$ 39 50
<i>Zurbite</i>	2	4 x 5	4½	¾	28 00	43 00
<i>Zoonic</i>	3	4½ x 6½	5½	1	31 50	46 50
<i>Zoolite</i>	4	5 x 7	7½	1½	42 00	57 00
<i>Zomar</i>	5	5 x 8	8½	1⅞	52 50	68 50
<i>Zode</i>	6	6½ x 8½	9½	1¾	63 00	80 50
<i>Zizel</i>	7	8 x 10	12⅞	2	84 00	101 50
<i>Zorcon</i>	8	10 x 12	17½	2½	132 50	
<i>Zincode</i>	9	12 x 15	23⅞	3½	188 50	

* The next larger plate is well covered with small stop.

Price for matching two lenses for stereoscopic work, \$3.00.

See page 66 for sizes of flanges.

Special sizes of Series III lenses, either larger or smaller than listed above, are made only to order. Prices on application.

When ordering shutters fitted to lenses, by telegraph, specify *Diaphragm* in addition to the code word for the size of lens.

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES IIIa.

SPEED f-9

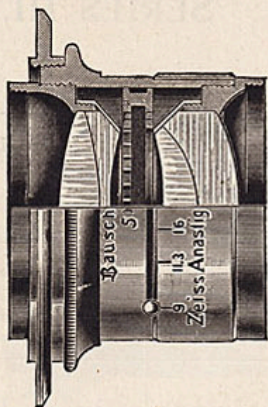


Figure represents the 5 x 7 Series IIIa Lens actual size.

Description. The objectives of this series are composed of four lenses, somewhat less in diameter than the preceding series, therefore lighter and more compact.

Optical Properties. Having a speed of f-9, they are suitable for all ordinary instantaneous work. The anastigmatic corrections are perfect beyond the size of plate for which they are rated. The field embraces an angle of 97 degrees, and about 55 degrees are included by the plates for which the various numbers are scheduled. It is therefore practical to use them as medium wide-angle lenses on larger plates than those for which they are rated, giving perfect definition to the margin, an advantage not possessed by any lens of any other make.

Application. Where a cheaper though somewhat slower lens than series IIa is desired for hand camera work, the IIIa is recommended.

Hand Cameras.

For general photography, they are good outdoor lenses and cheaper than Series IIa, and may be used as medium wide angle objectives on larger sized plates than those for which they are rated.

General Photography.

Stereoscopic Work.

The small sizes have the proper angle for stereoscopic work with great depth of focus.

PRICE-LIST OF Bausch & Lomb-Zeiss Anastigmat Lenses. SERIES IIIa.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-9.* Inches.	Equivalent Focus. Inches.	Free Diameter of Largest Lens. Inches.	Price.	
					Lens Only.	When Fitted with Diaphragm Shutter.
Zas	0	2½ x 3½	3	1⅞	\$ 21 00	\$ 36 00
Zif	00	3½ x 4½	3½	½	21 00	36 00
Zinn	1	4 x 5	4½	⅝	23 00	38 00
Zihn	2	4½ x 6½	5½	¾	26 50	41 50
Zeguel	3	5 x 7	6½	⅞	31 50	46 50
Zaddora	4	5 x 8	7½	1	35 00	50 00
Zerial	5	6½ x 8½	9⅞	1¼	45 50	60 50
Zerious	6	7 x 9	10½	1⅞	56 00	72 00
Zerf	7	8 x 10	12½	1⅝	70 00	86 00
Zerge	8	10 x 12	16	2	105 00	122 50
Zet	9	11 x 14	19⅞	2⅞	139 50	
Zeton	10	12 x 15	23⅞	2⅞	174.50	
Zetto	11	14 x 17	27⅞	3½	227 00	
Zeven	12	16 x 20	32½	3½	279 00	

* Next larger plate is well covered with smaller stop.

Price for matching two lenses for stereoscopic work, \$3.00.

For size of flanges see page 66.

Special sizes of Series IIIa lenses, either larger or smaller than listed above, are made to order only. Prices on application.

In using the telegraphic code specify *Diaphragm* if diaphragm shutter is desired, in addition to the code word for the size of lens.

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES IV.

SPEED f-12.5

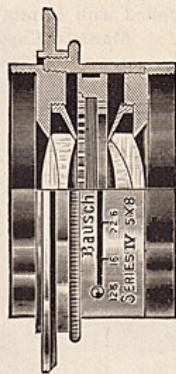


Figure shows 5 x 8 Series IV Lens actual size.

Description. These are very compact objectives, each system being composed of two lenses. The two systems are not, however, of the same focus, hence not usable as single lenses. The improved Jena glass is used in this as in the other anastigmats.

The mountings are all fitted with Iris Diaphragm, except the two smaller sizes, in which the systems are so close together that the revolving diaphragm only can be used.

Optical Properties. The speed is f-12.5, which is fast enough for outdoor instantaneous work under favorable circumstances. The field of the first six numbers embraces an angle of over 100 degrees. They give an angle of 68 degrees on the long side of the plates for which they are rated. The full angle of the larger numbers is 85 degrees, of which 44 degrees are utilized on the plates for which they are listed.

Application. For rapid wide-angle work or where architectural or other subjects are to be photographed instantly, and where the distance from the camera is such as to require a wide-angle lens, the first six numbers are recommended.

Flash-light Interiors. Interior photography, where a rapid lens is desired, as for flash-light work, and still a wide angle required.

Either enlarging or reducing. The five larger sizes are designed especially for copying, and are of less aperture than the smaller numbers of the series.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Anastigmat Lenses.

SERIES IV.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-1.5.* Inches.	Equivalent Focus. Inches.	Free Diameter of Largest Lens. Inches.	Price. Lens Only.
<i>Zibet</i>	1	3½ x 4½	2⅞	¼	\$ 17 50
<i>Zeud</i>	2	4 x 5	3½	⅜	17 50
<i>Zoffer</i>	3	4½ x 6½	4½	½	21 00
<i>Zein</i>	4	5 x 8	6⅞	⅝	24 50
<i>Zircon</i>	5	8 x 10	7½	1½	31 50
<i>Zoril</i>	6	10 x 12	10½	1	47 00
<i>Zennir</i>	7	12 x 15	15⅞	1⅞	71 50
<i>Zofil</i>	8	16 x 20	23½	2	125 50
<i>Zodic</i>	9	20 x 24	35½	2½	282 50
<i>Zunn</i>	10	24 x 30	48½	3½	631 00

* The next larger plate is well covered with smaller stop.

For sizes of flanges, see page 66.

In using the telegraphic code specify *Diaphragm* if the Iris Diaphragm shutter is desired fitted to the lens, in addition to the code word for the size of lens.

~~\$~~ 20.00

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES V.

SPEED f-18

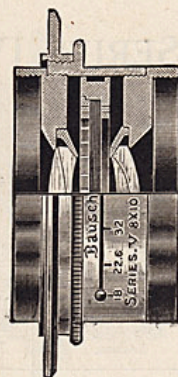


Figure shows 8 x 10 Series V Lens actual size.

Description. The two dissymmetrical systems are composed of two lenses each. Being small and very close together, the objectives are the most compact possible to construct. The mountings are fitted with the Iris Diaphragm, except in the two smaller sizes, where the systems are so close together that the revolving diaphragm only can be used.

Optical Properties. The speed of the lenses of this series is f-18. The field embraces an angle of 110 degrees in the sizes up to and including No. 7a. The full angle of the lenses above No. 7a is 90 degrees. On the plate for which the smaller numbers are rated, the angle is 75 degrees, but the full angle may be obtained by using them on larger plates with smaller stops. The larger sizes have an angle of about 40 degrees on the plates for which they are listed. The anastigmatic and spherical corrections are the most perfect yet obtained in a wide-angle lens, and the images are entirely free from distortion to the margin of the plate even with the most extreme angle.

Application. The lenses of this series are without question the most desirable extreme wide-angle lenses made, and should be selected wherever an extreme wide angle is required. They have greater speed and covering power and greater effective angle than any other extreme wide-angle lens, and are at the same time much more compact.

Copying. The larger sizes were designed especially for copying, and for that purpose cannot be equaled in the quality of work which they will do. They are, however, not quite rapid enough for some kinds of photo-engraving.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Anastigmat Lenses.

SERIES V.

All Lenses are supplied with Improved Iris Diaphragm
and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-18.* Inches.	Equivalent Foc. Inches.	Free Diameter of Largest Lens. Inches.	Price.	
					Lens Only.	When Fitted with Diaphragm Shutter.
<i>Zambo</i>	1	4½ x 6½	3¾	¾	\$ 22 50	
<i>Zanite</i>	2	5 x 7	4¾	¾	22 50	
<i>Zeal</i>	3.	6½ x 8½	5½	½	28 00	\$ 43 00
<i>Zebra</i>	4	8 x 10	7½	½	35 00	50 00
<i>Zebu</i>	5	10 x 12	8¾	½	44 00	59 00
<i>Zealot</i>	6	11 x 14	10½	½	54 50	69 50
<i>Zenith</i>	7	12 x 15	12½	½	64 50	79 50
<i>Zet</i>	7a	16 x 18	15¾	1	75 00	90 00
<i>Zulo</i>	8	12 x 15	18½	1	85 50	100 50
<i>Zero</i>	9	16 x 18	24¾	1½	125 50	141 50
<i>Zest</i>	10	20 x 25	37½	2½	247 50	

* The next larger plate is covered with small stop.

Special sizes of Series V lenses, either larger or smaller than listed above, will be made to order only. Prices on application.

See page 66 for sizes of flanges.

When ordering shutter fitted to lenses, by telegraph, specify *Diaphragm* if the Iris Diaphragm shutter is desired, in addition to the code word for the size of lens.

BAUSCH & LOMB-ZEISS ANASTIGMAT LENS, SERIES VII.

SINGLE ANASTIGMATS.

SPEED $f-12.5$

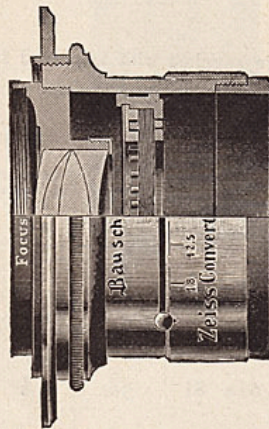


Figure shows No. 1, Series VII Lens actual size.

Description. The single anastigmatic system is composed of four elementary lenses (two pairs) cemented together. The lens system is mounted in a separate adapter of standard size, which fits either end of the tube of the mount. This construction has been adopted to carry out the original design of the inventor of this remarkable lens, viz.: the combination of two systems of the same or different foci, each of which is in itself a perfect anastigmat, to form a doublet of extreme speed and angle. A Series VII single anastigmat consists of one lens system in an adapter as described above, and a mounting into which the lens system fits (see figure). The mounting is provided with Iris Diaphragm. The diaphragm apertures (stop numbers) are engraved in U. S. numbers on a movable ring, which may bear numbers for two or more single anastigmats of different foci, and also for their combined focus. Each system has a serial number and the focal length engraved upon it for reference.

Optical Properties. The history of lenses shows the invention, trial, and decadence of a large number of "all purpose" lenses, i. e., doublets in which it was sought to produce single systems of sufficient covering power to be usable separately, and which, when combined, would produce a good doublet

of greater speed and angle. Some of these lenses are still offered, but they will be found unsatisfactory for the reason that the astigmatism and spherical distortion inherent in all single systems of the symmetrical type of lens, are impossible of elimination except by the method devised by **Correction.** Dr. Rudolph for the single anastigmats, viz., the anastigmatic correction of the single systems according to the same principles employed in the correction of the preceding systems of doublets. The increase in the number of lenses and the development of suitable glass has made it



FIG. 1.

Made with a 7-in. Focus Convertible Anastigmat Lens.

possible to apply these principles in the single anastigmats with much more satisfactory results than is possible where a less number is employed.

Speed. The speed of the single anastigmats is $f-12.5$.

Angle. The field has an angle of 85 degrees, of which from 35 to 48 degrees are utilized on the plates for which each size is listed.

The images given are anastigmatic, very flat, and with almost no distortion, the little which does exist being detectable only in that portion of the image circle outside of the area included by the plate for which each size is listed.

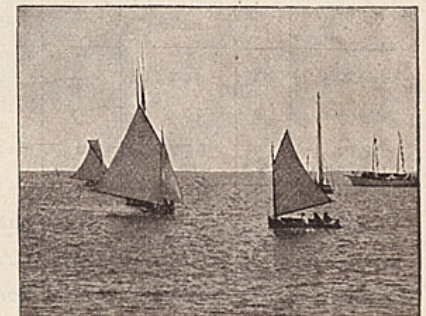


FIG. 2.

Made with Back Combination of 7-in. Convertible Anastigmat Lens, from same position as Fig. 1.

Application. While it is not intended that the single anastigmats shall take the place of the more rapid and wider angle doublets, they form the basis for the Series VIIa Convertible Landscape Anastigmats, and have in addition a distinct field of their own, in that, when used singly, they give the most excellent results as landscape lenses, the ratio of focus to diagonal of plate for each number being considerably greater than that of the doublet lenses commonly used for all around work.

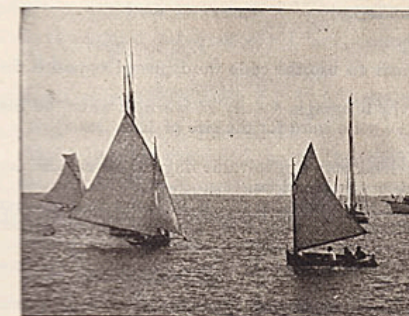


FIG. 3.

Made with Front Combination of 7-in. Convertible Anastigmat Lens, from same position as Fig. 1.

as landscape lenses, the ratio of focus to diagonal of plate for each number being considerably greater than that of the doublet lenses commonly used for all around work.

The speed is sufficient for instantaneous exposures under favorable circumstances.

Group Work. For outside group work they are also excellent, giving negatives of great brilliancy and beautiful definition, with agreeable perspective.

PRICE-LIST

OF

Bausch & Lomb-Zeiss Single Anastigmat
Lenses.

SERIES VII.

All Lenses are Supplied with Improved Iris Diaphragm and
Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop <i>f</i> -12.5.* Inches.	Equivalent Focus. Inches.	Back Focus. Inches.	Diameter of Front Lens. Inches.	Diam. of Image. Inches.	Price.	
							Lens Only.	When Fitted with Diaphragm Shutter.
<i>Acacia</i>	1	4½ x 6½	7½	8	⅞	11	\$ 26 50	\$41 50
<i>Acarina</i>	2	5 x 7	9	9½	¾	13½	30 00	45 00
<i>Aceton</i>	3	6½ x 8½	11½	12½	1	17½	35 00	50 00
<i>Achilles</i>	4	8 x 10	14	15½	1¼	21½	42 00	57 00
<i>Acidalia</i>	5	10 x 12	16½	18½	1½	25	54 50	70 50
<i>Aconitum</i>	6	11 x 14	19½	21½	1¾	29	75 00	92 50
<i>Adinol</i>	7	12 x 16	23½	26½	2	35½	96 00	
<i>Aeneas</i>	8	13 x 16	27½	30½	2¼	41½	125 50	
<i>Aeolus</i>	9	16 x 18	30½	34	2¾	47½	174 50	
<i>Aequator</i>	10	16 x 20	34	37½	3½	52	227 00	
<i>Aether</i>	11	18 x 22	39½	43½	3¾	60	296 50	

*The next larger plate is well covered with small stop.

When ordering by telegraph it is sufficient to use the code word placed opposite the number.

When ordering shutters fitted to lenses, by telegraph, specify *Diaphragm* when the Iris Diaphragm shutter is desired, in addition to the code word for the size of lens.

For sizes of flanges, see page 66.

The mountings of these lenses are provided with a revolvable ring, engraved with the *F* value of each of the Single and of the Doublet combinations.

If an additional combination is purchased, the graduated ring is exchanged for another engraved with scales for all of the combinations. A stop fixes the scale in the proper position.

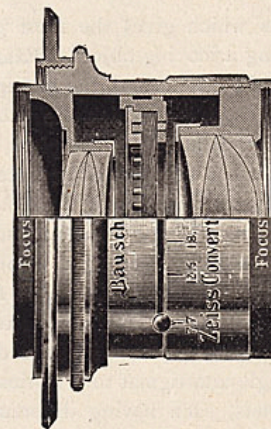
When ordering an additional Single combination, give the serial number of the lens with which it is to be used.

When the Single combination is desired without mounting, an allowance of \$1.50 will be made on numbers 1-5, and \$3.00 for numbers 6-10.

Nos. 1, 2, and 3 fit the same mount, and each larger size requires a succeedingly larger mount; all sizes below any given size can, however, be fitted for that mount if desired.

BAUSCH & LOMB-ZEISS
CONVERTIBLE ANASTIGMAT LENS
SERIES VIIa.

QUADRUPLE ANASTIGMATS.

SPEED *f*-6.3

Description. The Convertible Anastigmats are doublet lenses composed of two of the single anastigmats, Series VII. They contain eight elementary lenses arranged in pairs, two pairs in each system. They may therefore be properly termed quadruple anastigmats. Such a lens is convertible into three lenses of different foci and angle where the two single anastigmats are of different foci, or into two where they are of the same foci.

The most practical combinations of single anastigmats are indicated in the appended table of Series VIIa lenses.

Optical Properties. The speed when composed of two single anastigmats of the same foci is *f*-6.3. When the single anastigmats are of different foci, the speed is *f*-7 or *f*-7.7, according to the relative foci employed.

The full angle of the image circle is 80 degrees. The average angle utilized on the size plate for which the numbers are commonly used is about 55 degrees.

As might be expected from the excellence of the single anastigmats, the Convertible Anastigmats formed by combining two of them are simply perfection in all the qualities which are desired in a photographic lens. The covering and defining power is faultless. All parts of the image circle are equally well corrected. It is possible, therefore, to use, and still retain the large aperture, lenses of much shorter foci than where the optical properties are of a lower order, hence the great depth of focus and angle which the members of this series possess.

Astigmatism is entirely eliminated, and as an example of the mathematical perfection of the image, we cite the fact that the Series VIIa lenses are now used in the delicate work of copying bank check, certificate, and bond engravings, the lines of which are very fine and run at every conceivable angle. Such perfection not only yields excellent results in ordinary photography under adverse circumstances, but adds that much desired brilliancy to all the work of the lens.

Application. The photographer who essays all classes of subjects with one lens only, whatever the focus of that lens may be, will surely be disappointed in many ways.

The long-focus lens which gives the most pleasing landscapes will fail utterly for photographing a moving object. Examples of this kind might be cited indefinitely. On the other hand, the multiplicity of lenses, front boards, flanges, shutters, cases, caps, etc., which the photographer is forced to carry about with him in order to have a "complete equipment" in the ordinary sense of the word, is almost equally unfortunate. The problem is solved by the Convertible Anastigmat, as each of its systems may be used singly for

work requiring a long or medium long focus, low or medium angle and medium speed, while the combined systems give an extra rapid lens of wide angle suitable for the fastest instantaneous exposures, the most difficult architectural subjects, and for any situation where speed, angle, covering power, depth of focus, and brilliancy are required. By the addition of one single anastigmat to a Series VIIa lens, six lenses, three single and three doublets, each having different angle, focus, and covering power, may be obtained.

The addition of two single anastigmats to a Series VIIa lens, gives ten different lenses, four single and six doublets.

The advantages of the convertible features of the Series VIIa lenses may be summed up as follows:

Every doublet is in reality three lenses, each perfectly adapted for a separate kind of work.

The addition of one system adds three lenses, making six in all.

The addition of two systems adds seven lenses, making ten in all.

The greatest possible compactness is secured.

The least weight.

The fewest parts to lose or wear out.

For hand cameras these lenses stand at the head of the list both in optical qualities and in their adaptability to the limited space allowed for the lens. In selecting the lens see that the *back focus* of no combination selected is longer than the greatest extension of which the bellows is capable.

The Series VIIa Anastigmats in which the two systems are of the same foci, and especially the larger sizes, are well adapted for process work and copying of all kinds. The fact that they are now in use by many prominent photo-engravers, and give universal satisfaction, is the best evidence of their excellence.

**Hand
Cameras.**

**Photo-
Engraving.**

PRICE-LIST

OF

Convertible Anastigmat Lenses.

SERIES VIIa.

Telegraphic Code.	No.	Size in Inches of Plate Covered with Full Aperture.*	Combinations of Single Anastigmats.		Combined Equivalent Focus. Inches.	Speed.	Diameter of Image Inches.	Price.	
			Focus.					Lens Only.	When Fitted with Diaphragm Shutter.
			Front Lens.	Back Lens.					
<i>Agonic</i>	1	3½ x 3½	7½	7½	4½	f-6.3	6¾	\$ 51 00	\$ 66 00
<i>Alabaster</i>	2	5¼ x 4¼	9	7½	4½	f-7	7½	54 50	69 50
<i>Alauda</i>	3	4 x 5	11½	7½	5	f-7.7	8½	59 50	74 50
<i>Albatros</i>	4	4 x 5	9	9	5	f-6.3	8½	58 00	73 00
<i>Alizarin</i>	5	4¼ x 6½	11½	9	5¾	f-7	9½	63 00	78 00
<i>Alkalioid</i>	6	4¼ x 6½	14	9	6¼	f-7.7	10½	70 00	85 00
<i>Alkohol</i>	7	4½ x 7½	11½	11½	6½	f-6.3	10¾	68 00	83 00
<i>Amidon</i>	8	5 x 7½	14	11½	7	f-7	12	75 00	90 00
<i>Amagas</i>	9	5 x 8½	16½	11½	7½	f-7.7	12¾	87 50	103 50
<i>Anchovis</i>	10	5 x 8½	14	14	8	f-6.3	13½	82 00	97 00
<i>Anilin</i>	11	6½ x 8½	16½	14	8½	f-7	14½	94 50	110 50
<i>Anthracit</i>	12	6½ x 8½	19½	14	9½	f-7.7	15¼	115 50	133 00
<i>Antimon</i>	13	6½ x 8½	16½	16½	9½	f-6.3	15½	106 50	122 50
<i>Antipyrin</i>	14	7 x 9	19½	16½	10	f-7	16¾	127 50	145 00
<i>Apatat</i>	15	7 x 9	23½	16½	11	f-7.7	18¼	148 50	166 00
<i>Aristes</i>	16	7 x 9	19½	19½	11	f-6.3	18¼	146 50	164 00
<i>Absent</i>	17	8 x 10	23½	19½	12	f-7	20	167 50	185 00
<i>Albanc</i>	18	8 x 10	27½	19½	12¾	f-7.7	21½	197 00	214 50
<i>Atlas</i>	19	8 x 10	23½	23½	13½	f-6.3	22¼	188 50	206 00
<i>Arpion</i>	20	10 x 12	27½	23½	14½	f-7	24	218 00	
<i>Aurora</i>	22	10 x 12	27½	27½	15½	f-6.3	26	247 50	
<i>Autor</i>	25	10 x 12	30¾	30¾	18¾	f-6.3	26	345 50	
<i>Explosin</i>	28	11 x 14	34	34	20½	f-6.3	28½	450 00	
<i>Exuvia</i>	30	12 x 16	39½	39½	23½	f-6.3	31½	589 50	

*The next larger plate is covered with smaller stop.

The mountings of these lenses are provided with a revolvable ring, engraved with the *F* value of each of the Single and of the Doublet Combinations.

The correct stop for each of the lenses is thus always read from the scale, exactly as in the case of a simple lens.

If an additional combination is purchased, the graduated ring is exchanged for another, engraved with scales for all the combinations.

When ordering an additional Single Combination, give the number of the lens with which it is to be used.

Nos. 1, 2, 3, 4, 5, and 7, when desired for hand cameras, are mounted in special compact mountings, and the 4 x 5 Iris Diaphragm Shutter can then be fitted to them, in which case a reduction of \$1.00 is made from the listed price of the respective sizes fitted with Iris Diaphragm Shutter.

SETS OF BAUSCH & LOMB-ZEISS CONVERTIBLE ANASTIGMATS.

While a large number of doublet combinations are listed, having their uses for the same purposes as other doublet lenses, there are two sets of the Single Anastigmats which practically cover the entire field.

These sets are offered complete with the lenses mounted interchangeably, each set consisting of:

One lens mount with iris diaphragm, cap, and flange, as described under Series VII.

The Single Anastigmat Lenses (three or four as the case may be).

A neat and compact morocco case containing all the parts of the set.

C SET OF ANASTIGMATS.

Complete in case, \$103.00. Code word, *Alpha*.

C set of anastigmats fitted with Iris Diaphragm Shutter, \$118.00.

The six lenses which may be formed with the C set of anastigmats are shown in the accompanying table, together with their angles, covering power, and speeds.

SERIES.	No.	Size of Plate Covered with Largest Stop.* Inches.	Equivalent Focus of Lenses in Inches.			Speed.	Angle on 5 x 8 Plate. Degrees.
			Front Lens.	Back Lens.	Combined Focus.		
VII.	2	5 x 8		9		f-12.5	48
	3	6½ x 8½		11½		f-12.5	38
	4	8 x 10		14		f-12.5	32
VIIa.	5	4½ x 6½	11½	9	5½	f- 7.0	70
	6	5 x 7	14	9	6½	f- 7.7	65
	8	5 x 8	14	11½	7	f- 7.0	59

*The next larger plate is well covered with smaller stop.

D SET OF ANASTIGMATS.

Complete in case, \$200.00. Code word, *Alphabet*.

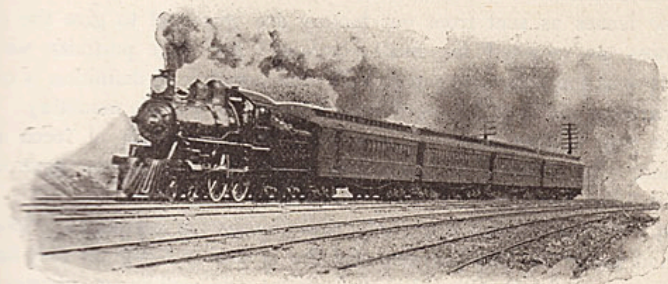
D set of anastigmats fitted with Iris Diaphragm Shutter, \$217.50.

The lenses of this set are the numbers 3, 4, 5, and 6 of Series VII.

The following table shows the ten lenses which may be formed with this set, together with their angles, covering power, and speed.

SERIES.	No.	Size of Plate Covered with Largest Stop.* Inches.	Equivalent Focus of Lenses in Inches.			Largest Stop.	Angle on 8 x 10 Plate. Degrees.
			Front Lens.	Back Lens.	Combined Focus.		
VII.	3	6½ x 8½		11½		f-12.5	47
	4	8 x 10		14		f-12.5	39
	5	10 x 12		16½		f-12.5	34
	6	11 x 14		19½		f-12.5	29
VIIa.	8	5 x 8	14	11½	7	f- 7.0	71
	9	5 x 8	16½	11½	7½	f 7.7	67
	9a	5 x 8	19½	11½	8	f- 7.7	64
	11	6½ x 8½	16½	14	8½	f- 7.0	61
	12	6½ x 8½	19½	14	9½	f- 7.7	57
	14	8 x 10	19½	16½	10	f- 7.0	53

*The next larger plate is well covered with small stop.



Made with Iris Diaphragm Shutter.

UNIVERSAL PORTRAIT LENS, SERIES A.

SPEED f-4

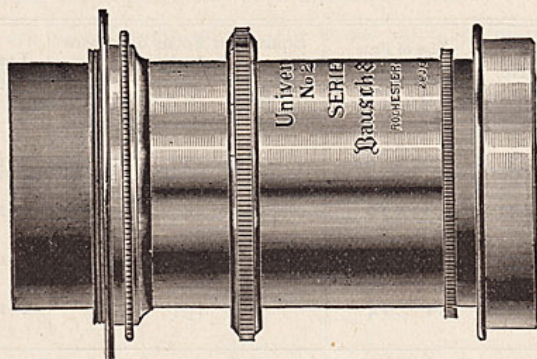


Figure shows the No. 2 Universal Portrait Lens one-fourth actual size.

Description. These lenses are composed of two systems, the elementary lenses of the front system being cemented together, while those of the back system are separated. The rear lens is mounted in an adjustable mounting, permitting correction of the lens by the operator.

All sizes are provided with improved iris diaphragm.

Optical Properties. The speed of these lenses being f-4, they are suited for the most rapid studio work. Optically they possess those special requisites which make a portrait lens, and which exist only to a very indifferent degree in lenses constructed for other work.

The lenses as sent from our factory are corrected to give the greatest sharpness, as required for small portraits. For large portraits, where the sitter is near the lens, a greater depth and equality of definition is obtained by separating the back lenses by means of the adjustable mounting. In this manner any desired softness, roundness, or distribution of focus may be obtained. In addition to the above qualities, these lenses have unusual freedom from distortion, and even illumination.

Application. For portrait work only, these lenses are unequaled. They were designed solely for this purpose, and the favorable reception they have had at the hands of the most expert and well-known photographers, proves that they meet the requirements.

The number three of this series is especially recommended for cabinet work.

Testimonials on application.

PRICE-LIST

OF

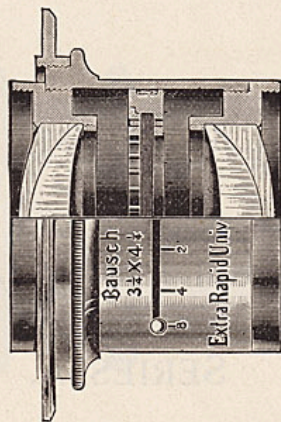
Universal Portrait Lenses.

SERIES A.

Telegraphic Code.	No.	Size. Inches.	Diameter of Lenses. Inches.	Back Focus. Inches.	Price.
<i>Uberty</i>	1	4 x 5	2 $\frac{1}{2}$	6 $\frac{1}{2}$	\$ 65 00
<i>Udal</i>	2	5 x 8	3 $\frac{1}{2}$	8 $\frac{1}{2}$	90 00
<i>Udaler</i>	3	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{2}$	135 00
<i>Udder</i>	4	8 x 10	4 $\frac{1}{2}$	13 $\frac{1}{2}$	190 00

EXTRA RAPID UNIVERSAL LENS, SERIES D.

SPEED f-6

Figure shows $3\frac{1}{4} \times 4\frac{1}{4}$ Series D Lens actual size.

Description. This is the extra rapid type of rectilinear lens, the front and back systems being each composed of two lenses cemented together.

The lenses are of large diameter, but, being quite thin, do not increase the weight of the lens appreciably. The mounting is very compact.

Optical Properties. The speed of the lens is f-6.

The image circle embraces an angle of 70 degrees.

This series represents the best of the rectilinear type of lenses, in speed, covering power, and depth of focus.

Application. Thousands of photographers in all branches are to-day using this excellent lens, and, while it does not equal the anastigmats in all respects, it is **General Work.** a good and serviceable lens for general work, has sufficient speed for the most rapid instantaneous work and a decided advantage in price.

The compactness, speed, depth of focus, and moderate price recommend the smaller sizes for hand cameras, while its speed is greater than necessary under ordinary conditions. Ample exposure is obtained on dark and misty days where other slower lenses would fail.

Studio. For studio work this lens will be found especially satisfactory, as the field and focus, especially in the larger sizes, are admirably suited for portraiture, and it has sufficient covering power for excellent group work.

The speed, f-6, is sufficient for all occasions, as the rapid plates now in general use do not require a more rapid lens in the studio. These lenses are now in use in many of the best known studios.

PRICE-LIST

OF

Extra Rapid Universal Lenses.

SERIES D.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate. Inches.	Diameter of Lenses. Inches.	Equivalent Focus. Inches.	Back Focus. Inches.	Price.	
						Lens Only.	Lens with Diaphragm Shutter.
<i>Ukase</i>	0	$3\frac{1}{4} \times 4\frac{1}{4}$	1	$4\frac{1}{2}$	$3\frac{1}{2}$	\$ 24 00	\$ 39 00
<i>Ulaus</i>	00	4 x 5	$1\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{1}{2}$	28 00	43 00
<i>Uler</i>	1	5 x 8	$1\frac{1}{2}$	8	7	36 00	51 00
<i>Ulema</i>	2	$6\frac{1}{2} \times 8\frac{1}{2}$	$1\frac{1}{2}$	$9\frac{1}{2}$	$8\frac{1}{2}$	46 00	62 00
<i>Ulnim</i>	3	8 x 10	$2\frac{1}{2}$	$11\frac{1}{2}$	$9\frac{1}{2}$	58 00	75 50
<i>Ulnage</i>	4	10 x 12	$2\frac{1}{2}$	$14\frac{1}{2}$	$12\frac{1}{2}$	75 00	
<i>Umbel</i>	5	12 x 15	$3\frac{1}{2}$	$17\frac{1}{2}$	$15\frac{1}{2}$	100 00	
<i>Uمبر</i>	6	16 x 20	$3\frac{1}{2}$	$22\frac{1}{2}$	$19\frac{1}{2}$	130 00	

When ordering lenses fitted with shutter, specify *Diaphragm*, in addition to the code word for the size of lens.

Testimonials from prominent photographers on application.

RAPID UNIVERSAL LENS.

SPEED f-8

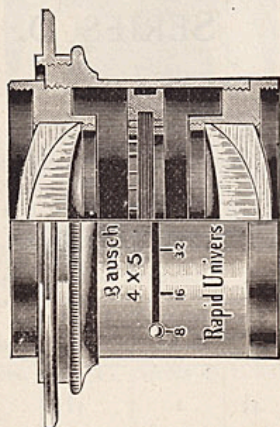


Figure shows the Rapid Universal Lens 4 x 5 actual size.

Description. This is our original rapid rectilinear type lens, the front and back systems being similar and composed of two lenses each. The mountings are now reduced in size and made as compact as possible in accordance with modern requirements.

Optical Properties. The speed of these lenses is f-8. The angle of the image circle is 70 degrees.

Application. This is the lens which a large majority of all amateur photographers have used up to 1896, and which a very large number are still buying and using. It has excellent covering power, and sufficient speed for all ordinary uses. The focus is such as to give a most agreeable perspective. The moderate price places a really good lens in the hands of those who cannot afford an anastigmat.

PRICE-LIST

OF

Rapid Universal Lenses.

All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Large Stop Covers.	Equivalent Focus. Inches.	Diameter of Image Circle. Inches.	Diameter of Lenses. Inches.	Back Focus. Inches.	Price.	
							Lens Only.	When Fitted with Diaphragm Shutter.
<i>Ucubis</i>	4½	3½ x 4½	5½	8	7/8	4½	\$ 18 00	\$33 00
<i>Umbria</i>	5	4 x 5	6½	9½	1 1/8	5½	22 00	37 00
<i>Unca</i>	8	5 x 8	8½	11	1 3/8	7½	26 00	41 00
<i>Unelli</i>	8½	6½ x 8½	11½	13½	1 5/8	10½	35 00	51 00
<i>Upis</i>	10	8 x 10	13½	15½	1 7/8	12½	48 00	65 50
<i>Uraca</i>	12	10 x 12	17	20	2 1/8	15	60 00	
<i>Uxantis</i>	15	12 x 15	20½	21½	2 5/8	18	75 00	
<i>Utica</i>	18	16 x 18	24½	27½	3 1/8	22½	95 00	
<i>Uzita</i>	22	20 x 22	31½	36	4 1/8	28	125 00	

When ordering lenses fitted with Iris Diaphragm Shutter by telegraph, specify *Diaphragm* in addition to the code word for size of lens.

ALVAN G. CLARK LENS.

SPEED f-8

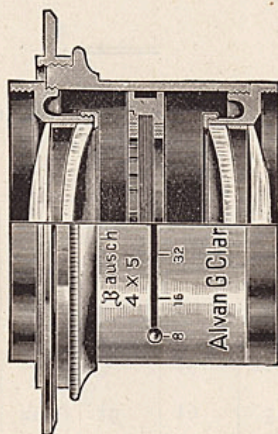


Figure shows the 4 x 5 Alvan G. Clark Lens actual size.

Description. These lenses are the invention of the late Alvan G. Clark, maker of the famous Clark telescopes, and differ from the rapid rectilinear type of lens, in that none of the lenses are cemented, and that the hardest glass is placed outermost; hence the lenses will never degenerate, or become slower, and are less liable to become scratched. The mountings are more compact than in the rectilinear lenses, as the systems are closer together.

Optical The speed is f-8.

Properties. The angle of the image circle is 100 degrees.

They are well corrected objectives, and have given satisfaction to a large number of photographers.

Application. They are applicable to all work for which the rectilinear type of lens is adapted, and possess the advantage over many in that they may be used for medium wide-angle work also.

PRICE-LIST

OF

Alvan G. Clark Lenses.

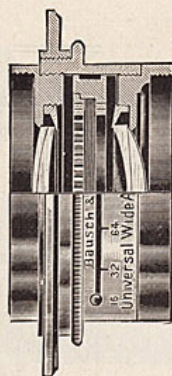
All Lenses are Supplied with Improved Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Largest Stop. Inches.	Equivalent Focus. Inches.	Diameter of Image Circle. Inches.	Diameter of Lenses. Inches.	Back Focus. Inches.	Price.	
							Lens Only.	When Fitted with Diaphragm Shutter.
<i>Abel</i>	4½	3½ x 4½	5½	8½	¾	4¾	\$ 20 00	\$ 35 00
<i>Abner</i>	5	4 x 5	6½	13	⅞	5¾	24 00	39 00
<i>Achan</i>	8	5 x 8	8½	16	1½	7¾	30 00	45 00
<i>Adam</i>	8½	6½ x 8½	11½	21½	1½	10½	38 00	54 00
<i>Agate</i>	10	8 x 10	13½	24½	1¾	12½	50 00	67 50
<i>Alema</i>	12	10 x 12	16	33	2½	15	64 00	
<i>Amasa</i>	15	12 x 15	19½	38	2¾	18	82 00	
<i>Arab</i>	18	16 x 18	23½	47	3	22	105 00	
<i>Arbah</i>	22	20 x 22	30	64	4½	28	145 00	

When ordering lens fitted with Iris Diaphragm Shutter, by telegraph, specify *Diaphragm* in addition to the code word for size of lens.

UNIVERSAL WIDE-ANGLE LENS.

SPEED f-16

Figure shows the $6\frac{1}{2} \times 8\frac{1}{2}$ Universal Wide-Angle Lens, actual size.

Description. These lenses represent the best of the symmetrical wide-angle lenses, the front and back systems each composed of two elementary lenses. They are extremely compact and portable. The substitution of the iris for the rotary diaphragm in this lens not only adds to the compactness of the mount, but gives a much greater variety of openings.

Optical The speed is f-16.

Properties. The image circle embraces an angle of over 100 degrees, of which 80 degrees are utilized on the plate for which the various sizes are rated. With smaller stops the full angle is obtained on smaller plates.

Application. The covering power and definition are excellent, and there is very little distortion of the image, even with the highest angles.

The speed of these lenses is sufficient to permit their use for interior flash-light and outdoor instantaneous photography. Their great aperture fits them for general wide-angle work, and while the images are not as perfect with extreme angles as in the anastigmats, they are most satisfactory lenses when anastigmat correction is not essential.

PRICE-LIST

OF

Universal Wide-Angle Lenses.

All Lenses are Furnished with Iris Diaphragm and Morocco Cap.

Telegraphic Code.	No.	Size of Plate Covered with Stop f-16.* Inches.	Equivalent Focus. Inches.	Back Focus. Inches.	Diameter of Lenses. Inches.	Diameter of Image Circle. Inches.	Price.
<i>Wade</i>	5	4 x 5	$3\frac{1}{2}$	$3\frac{1}{4}$	$\frac{3}{4}$	$8\frac{1}{4}$	\$16 00
<i>Wait</i>	8	5 x 8	$5\frac{1}{4}$	$4\frac{7}{8}$	$\frac{3}{4}$	13	20 00
<i>Walk</i>	$8\frac{1}{2}$	$6\frac{1}{2} \times 8\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{8}$	$\frac{7}{8}$	15	24 00
<i>Walrus</i>	10	8 x 10	8	$7\frac{1}{2}$	$1\frac{1}{8}$	18	28 00
<i>Water</i>	14	11 x 14	$10\frac{1}{2}$	$9\frac{7}{8}$	$1\frac{1}{2}$	$25\frac{1}{2}$	36 00
<i>Weaver</i>	17	14 x 17	14	$13\frac{1}{2}$	2	32	48 00
<i>Wale</i>	22	18 x 22	17	16	$2\frac{1}{4}$	37	60 00
<i>Whistle</i>	30	25 x 30	22	$20\frac{1}{4}$	$2\frac{1}{2}$	49	90 00

* The next size plate is well covered when using small stop, giving 95 degrees angle.

CHOICE OF LENSES FOR HAND CAMERAS.

In the subjoined tables we give a résumé of lenses suitable for hand cameras, from which a selection can be readily made. For additional information on the optical properties of lenses, reference may be made to the descriptions.

Hand cameras require the mountings of lenses to be as compact as it is possible to make them, in order to allow the camera to fold in a small space. We mount our lenses to meet this condition. Since hand camera work consists chiefly of instantaneous exposures, it is desirable to obtain speed, covering capacity, and depth of focus, with proper angular field; and the lenses recommended in the table combine these characteristics to the greatest possible extent. The equivalent focus of each is shorter than the diagonal of the plate and longer than its short side.

In all of these lenses the angle is sufficiently large so that they can be used on the next larger plate, thus giving a greater angular range, which is an immense advantage.

It is often desirable, and, in cases of interiors and confined situations, absolutely necessary, to use lenses having considerable angle, which can be obtained only by using a shorter focus, but in which, at the same time, covering power should be retained to the utmost possible extent. We therefore give also a table of such lenses (Table II.), which can be used under favorable conditions for instantaneous exposures.

An ideal outfit should comprise these two classes of lenses, which are made interchangeable in the shutter or barrel, and are optically of the greatest possible efficiency.

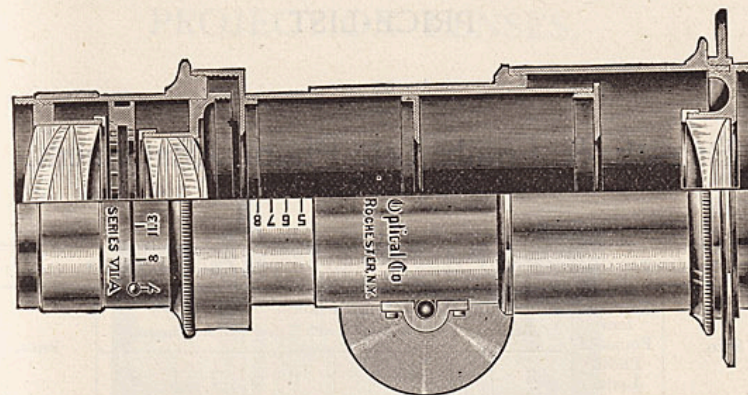
TABLE I. MEDIUM ANGLE LENSES.

SERIES.	3¼ x 4¼	4 x 5	5 x 7 5 x 8	6½ x 8½
Ia	No. 10	No. 11	No. 13	No. 14
II	No. 2	No. 3	{ No. 5 No. 6	No. 7
IIa	—	No. 1	No. 3	No. 4
III	No. 1	No. 2	{ No. 4 No. 5	No. 6
IIIa	No. 00	No. 1	{ No. 3 No. 4	No. 5
Ex. Rapid Universal .	No. 0	No. 00	No. 1	No. 2
Rapid Universal . .	No. 4¼	No. 5	No. 8	No. 8½
A. G. Clark	No. 4¼	No. 5	No. 8	No. 8½

TABLE II. WIDE ANGLE LENSES.

IV	No. 1	No. 2	No. 4	—
V	—	No. 1	No. 2	No. 3
Universal W. A. . .	—	No. 5	No. 8	No. 8½

**BAUSCH & LOMB
TELE-PHOTO ATTACHMENT.**



The Figure shows the Tele-Photo Attachment as applied to a Photographic Lens.

Description. The purpose of the Tele-Photo attachment is to produce larger pictures in connection with a photographic lens than can be obtained with the lens alone.

The Tele-Photo attachment is so designed that any ordinary photographic lens may be used with it. It possesses the advantage over a single long-focus lens that it does not require nearly as long a camera or extension of bellows to obtain the same magnification, and over the fixed tele-photo lens that it is easily applicable to lenses already in use, thus greatly reducing the cost and permitting a considerable variation in focus.

The attachment consists of an achromatic negative system mounted in a barrel with sliding tube, which is adjustable by rack and pinion.

The front of the barrel is threaded to receive the photographic lens, and the rear end is provided with a flange for attachment to the front board of the camera. The sliding-tube has scale indicating the exact amount of magnification.

Optical Properties. In the construction of this negative system, the greatest latitude has been allowed for variation in the lenses with which it is to be used, but it must always be borne in mind that any lack of sharpness in the image formed by the photographic lens will be exaggerated by the Tele-Photo attachment in direct proportion to the amount of enlargement, hence only lenses of the highest grade are suitable for tele-photo work.

Our Tele-Photo attachment permits a variation of magnifying power from three to eight diameters by simply adjusting the distance between the negative and positive lenses with the rack and pinion.

Application. There are many objects so situated that they cannot be satisfactorily photographed with an ordinary lens, but may be, readily, from a distance. In such cases a magnified (tele-photo) picture is required.

PRICE-LIST

OF

Bausch & Lomb Tele-Photo Attachment.

DISTANCE FROM THE FRONT BOARD TO THE GROUND GLASS.

Size.	Equiva- lent Focus of Photo Lens.	Magnification.						Price.
		Resulting Focus when used with Tele-Photo Attachment.						
Inches.	Inches.	3	4	5	6	7	8	
4 x 5	6½	6¾	9¾	12¾	16½	19¾	22¾	\$16 00
5 x 8	8¾	8½	13	17½	22	26½	31	18 00
6½ x 8½	11½	10½	16½	22½	28½	34½	40½	20 00
8 x 10	13½	13½	20½	27½	34½	41½	48½	24 00
Telegraphic Code.	Size. Inches.	Diameters of Image Circle.						
		When used with Tele-Photo Attachment.						
<i>Tab</i>	4 x 5	5½	7½	9½	12	15	17½	
<i>Tabby</i>	5 x 8	6½	9¾	12½	16½	19¾	22½	
<i>Tabid</i>	6½ x 8½	8	11	14½	18	22	26	
<i>Table</i>	8 x 10	9	12¾	16½	20¾	26	30	

N. B.—We do not advise the fitting of Tele-Photo Attachment to *any* except the *very best quality* lenses, as results will not be satisfactory.

Lenses should in all cases be sent us in order to secure correct adjustment and fitting.

The scale indicating magnification is computed for prevailing foci of photographic lenses, but special standardized scale will be made at an extra cost of 75 cents.

PROJECTION LENSES.

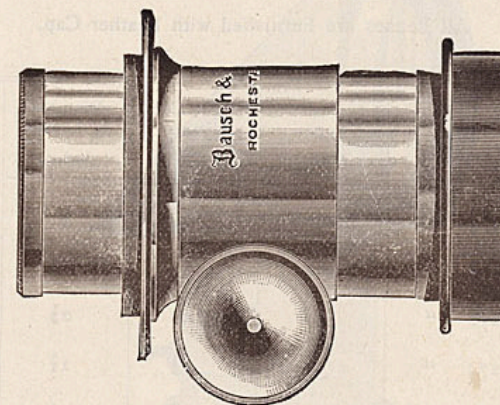


Figure shows the 1/4 Plate Objective two-thirds actual size.

Description. These lenses are designed for projecting magnified images of positive pictures on the screen, and are used in the stereopticon, magic lantern, etc. The lenses are mounted in a nicked tube, which is adjustable by rack and pinion for rapid and accurate focusing. Each lens also has a flange for attaching to camera board. The working parts are all constructed with great accuracy, and will be found to work much smoother than those of other lenses now on the market.

Optical Properties. These lenses are especially designed for projection purposes and utilize an exceptionally large amount of the light of the lantern, giving beautifully illuminated, sharp, clear pictures. Their extremely flat field gives a clear picture of equal sharpness over the entire screen. Optically, these lenses are greatly superior to the imported lenses which have been sold for projection work.

Application. For stereopticon, magic lantern, and all kinds of projection work, these lenses should be selected. Where a small picture is to be made to cover a large screen at a short distance, the special wide-angle objective No. 6 is recommended.

PRICE-LIST
OF
Projection Lenses.

All Lenses are Furnished with Leather Cap.

No.	Size.	Back Focus. Inches.	Equivalent Focus. Inches.	Diameter of Lenses. Inches.	Price.
1	4/4 Plate	10½	15	3	\$32 00
2	2/3 "	8½	12	2½	21 00
3	1/2 "	7	10	2¼	14 50
4	1/3 "	5½	7½	1¾	12 00
5	1/4 "	4½	6	1⅝	7 00
6*	1/4 "	3	5	1⅝	8 00

* Wide Angle.

TABLE SHOWING DISTANCE FROM OBJECT TO SCREEN, DIAMETER IN FEET OF PICTURE, AND FOCUS OF LENS WHICH MUST BE USED WHEN OBJECT IS THREE INCHES DIAMETER.

Equivalent Focus of Lens.	Distance from Object to Screen, in Feet.									
	10	20	30	40	50	60	70	80	90	100
15 in.			6	8	10	12	14	16	18	20
12 "			7½	10	12½	15	17½	20	22½	25
10 "		6	9	12	15	18	21	24		
7½ "	4	8	12	16	20	24				
6 "	5	10	15	20						
5 "	6	12	18	24						

PHOTOGRAPHIC PRISMS.

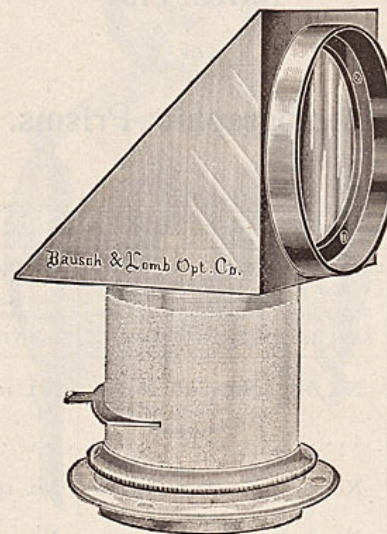


Figure shows the Prism and method of applying it to the lens.

Description. These prisms are mounted so as to be entirely protected by the metal case. They are attached to the hood of any photographic lens by a threaded adapter. The mountings are so arranged as to bring the surface of the prism as close as possible to the front of the lens, thus securing the greatest effective angle of the lens and the maximum illumination and speed. The glass is of the purest quality and greatest possible light transmitting properties.

Optical Properties. The three surfaces are optically plane and have the highest possible polish, thus giving the least loss of light. There is no interference whatever with the sharpness of the image produced by the lens.

Application. The prism is used to reverse the image formed by the lens, from left to right, thus making it unnecessary to strip and turn the films in process work.

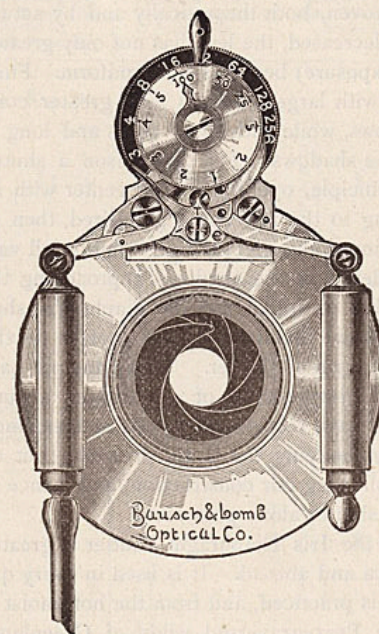
It effects a great saving in time and labor, and obviates the danger of stretching or damaging the film during manipulation.

PRICE-LIST
OF
Photographic Prisms.

Full Aperture of Prism. Inches.	Figures in the margin show correct size Prism for Lenses as below.					Price.	
	Bausch & Lomb Zeiss Planar.	Bausch & Lomb Zeiss Anastigmat.	Bausch & Lomb Zeiss Anastigmat.	Bausch & Lomb Zeiss Anastigmat.	Bausch & Lomb Zeiss Convertible Anastigmat.	When fitted to B & L-Zeiss Lens.	When fitted to Lenses of other make.
	Series Ia.	Series IIa.	Series IV.	Series V.	Series VIIa.		
2½	No. 12	No. 6	No. 7	No. 9	No. 16	\$ 45 00	\$ 47 00
2¾	No. 13	....	....	....	....	53 00	55 00
3	No. 14	No. 7	No. 8	No. 10	No. 19	65 00	67 00
3½	No. 15	No. 8	....	....	No. 22	78 00	80 00
4	No. 16	....	....	....	No. 25	90 00	93 00
4½	No. 17	....	No. 9	....	No. 28	140 00	145 00
5½	No. 18	....	No. 10	....	No. 30	180 00	185 00

In estimating the size of prism which is required for a particular lens, a size should be selected which is at least equal to the diameter of the hood. A size which is larger than this is preferable, but under no circumstances should a smaller one be selected, as, in the work in which these prisms are required, it is of great importance to utilize all the light which the lens can transmit.

THE IRIS DIAPHRAGM SHUTTER.



The construction of the Iris Diaphragm Shutter is based on a careful consideration of the optical principles involved, and it is without question the most scientifically correct shutter yet produced.

The following are some of its advantages :

It is placed between the systems of the lens, at the diaphragm point, thus acting as stop and shutter at once. No extra stops or iris diaphragm are needed.

It gives absolutely uniform illumination over the entire plate.

It gives brilliant high lights, and at the same time definition in the shadows.

It gives automatically any exposure from one one-hundredth of a second to three seconds. It gives time exposures of any duration.

It has setting device to give any size opening from pin-hole to the largest stop.

It is operated either by pneumatic bulb or finger release.

A simple turn of the setting lever makes it ready for exposure.

It cannot open, or expose the plate, while being set.

It does not jar the camera, even when working at the highest speed.

It can be applied to any lens, and always improves its covering power and depth of focus.

It can be arranged for use with two or more lenses.

It is especially adapted for hand camera lenses.

In devising the Iris Diaphragm Shutter we have succeeded in equalizing the distribution of light over the entire plate more perfectly than is possible with any other construction.

It can be easily proven, both theoretically and by actual experience, that as the size of stop is decreased, the lens has not only greater covering power, but the illumination (exposure) becomes more uniform. Furthermore, it is well known that exposures with large openings give greater contrast between the high lights and shadows, while with small stops and long exposures, greater detail is obtained in the shadows. For this reason a shutter constructed on the iris diaphragm principle, opening in the center with a minute aperture, and gradually enlarging to the full opening desired, then gradually reducing its opening to the closing point, gives the high lights full value and sharpness, depth of focus, and detail in the shadows approaching the results obtained with small stops, so that in actual use the diaphragm shutter gives greater covering power, more equal illumination, and greater depth of focus than is possible with any other form of shutter. This principle having been brought before the public by the introduction of our shutter, a number of prominent optical firms in Europe have recognized its advantages, and have endeavored to construct shutters embodying the same principle, but they are prevented by our patents from following our construction, and hence cannot obtain the advantages which our shutter alone possesses.

The popularity of the Iris Diaphragm Shutter is greater to-day than ever before, both in America and abroad. It is used in every quarter of the globe in which photography is practiced, and from the hot, moist atmosphere of the Indian jungles to the Peary-traversed wilds of Greenland, has proven its adaptability to every climate and every condition.

While the Iris Diaphragm Shutter meets all requirements for instantaneous work, we disclaim its suitability for ultra rapid photography, although surprising results, such as trains running sixty miles per hour, and trotting horses, show its capacity under suitable management.

For all except the ultra-rapid, it has no competitor.

Price-List of Iris Diaphragm Shutter.

SIZE.	When Fitted to Rapid Universal, Extra-rapid Universal, with Regular Barrel and Diaphragm.	When Fitted to Lenses of Other Manufacture, Leaving Barrel Intact.	Alvin G. Clark.	Bausch & Lomb-Zeiss Anastigmat Series II, IIa, and III.
4 x 5	\$14 00	\$14 50		
5 x 8	15 00	15 50	4½ } \$15 00	1 } \$15 00 2 } 3 } 4 }
6½ x 8½	16 00	16 50	8½ } 16 00	5 } 16 00
8 x 10	17 50	18 00	10 } 17 50	7 } 17 50

Price-List of Iris Diaphragm Shutter.—Continued.

SIZE.	Bausch & Lomb-Zeiss Anastigmat Series II and IIa. Special for Hand Cameras.	Bausch & Lomb-Zeiss Anastigmat Series IIIa.	Bausch & Lomb-Zeiss Anastigmat Series IV.	Bausch & Lomb-Zeiss Anastigmat Series V.
4 x 5	1† } \$14 00 2† } 3† }			
5 x 8	4 } 15 00 5 }	0 } 1 } \$15 00 2 } 3 } 4 } 5 }	3 } \$15 00 4 } 5 }	3 } \$15 50 4 } 5 } 6 } 7 } 8 }
6½ x 8½		6 } 16 00 7 }	7 } 16 00	9 } 16 00
8 x 10		8 } 17 50	8 } 17 50	

SIZE.	Bausch & Lomb-Zeiss Anastigmat Series VII.	Bausch & Lomb-Zeiss Anastigmat Series VIIa.	Bausch & Lomb-Zeiss Anastigmat Series VIIa. Special for Hand Cameras.	Telegraphic Code.
4 x 5			1† } \$14 00 2† } 3† } 4† } 5† } 7† }	<i>Dalphon</i>
5 x 8	1 } \$15 00 2 } 3 } 4 }	1 } 2 } 3 } \$15 00 4 } 5 } 6 } 7 } 8 } 10 }		<i>Danites</i>
6½ x 8½	5 } 16 00	9 } 16 00 11 } 13 }		<i>Dara</i>
8 x 10	6 } 17 50	12 } 17 50 14 } 16 } 15* } 17* } 18* }		<i>Darius</i>

* Gives effective aperture when lens is used as a doublet, but reduces speed of the single combination of lens and shutter.
† Owing to additional work involved when so adapted, no extra barrel is supplied.

To graduate disk to correspond with stops accompanying lens, extra, 50c.
Finger release attachment to shutters, 5 x 8 to 8 x 10 size, extra, \$1.00. (4 x 5 is regularly supplied with finger release at no additional cost.)
Telegraphic code refers to shutters in brass mounting; if desired in aluminum it should be so stated.

Size of Opening, in inches,	½	1½	1⅞	1¼
Size of Shutter { Over all, in height } { and width. }	2½ x 4	3½ x 4½	3½ x 5½	4½ x 5½

THE UNICUM SHUTTER.

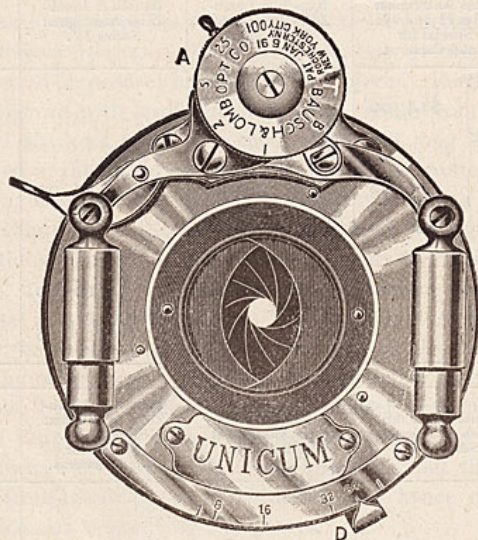


Figure shows the 4 x 5 Unicum Shutter actual size.

The Unicum Shutter is of the same general form as the Iris Diaphragm Shutter, and is intended to meet the demand for a cheaper, yet well made and durable shutter.

The case of the Unicum Shutter is of highly finished bronze metal, and the actuating mechanism is well protected from dust and injury.

The shutter blades are of thin rubber, so shaped as to give the most even illumination possible with two blades only, the aperture formed by them being at first elliptical, becoming circular.

Back of the shutter blades there is an iris diaphragm, operated by the index lever at the lower margin of the shutter, by which any desired size of stop can be obtained.

This shutter gives automatic exposures from one one-hundredth of a second to one second, and has, in addition, a "bulb exposure" so arranged that compression of the pneumatic bulb opens the shutter, and the blades remain open as long as the bulb is compressed, closing instantly when it is released. This is a very useful feature, as short exposures over one second can be made with sufficient accuracy, and in photographing children, animals, and other objects where their movements are uncertain, it is also possible to obtain a much longer exposure with the bulb than it would be safe to hazard with the automatic exposure.

The shutter also has regular time exposure, the blades being opened by pressure of the bulb, and remaining open until closed by again pressing the bulb.

Accuracy of exposure and freedom from jar are secured by our pneumatic retarding device.

The Unicum Shutter can be fitted between the combinations of all lenses except where they are extremely close together.

The tens of thousands of these shutters, which are now in daily use in all parts of the world, vouch for their correctness of construction and superior workmanship.



Price-List of Unicum Shutter

When fitted to lenses as specified.

SIZE.	Size of Opening. Inches.	Rapid Universal, A. G. Clark, and Extra-rapid Universal Lenses.	Bausch & Lomb-Zeiss Anastigmat Series II, IIa, and III.	Bausch & Lomb-Zeiss Anastigmat Series IIIa.	Bausch & Lomb-Zeiss Anastigmat Series VII.	Bausch & Lomb-Zeiss Anastigmat Series VIIa.
4 x 5	$\frac{1}{8}$	.....	.....	.....	.....	.....
5 x 8	$1\frac{1}{8}$	$3\frac{1}{4} \times 4\frac{1}{4}$ } 4×5 }	1 } 2 } 3 }	2 } 3 } 4 }	1 } 2 } 3 }	1 } 2 } 3 } 4 } 5 } 6 } 7 } 8 } 10 }
$6\frac{1}{2} \times 8\frac{1}{2}$	$1\frac{1}{8}$	5×8 } $6\frac{1}{2} \times 8\frac{1}{2}$ }	4 } 5 }	5 } 6 }	4 } 5 }	9 } 11 } 13 }

SIZE.	Price.		Price when Fitted to Other Lenses.	
	With Retarding Device.	Without Retarding Device.	With Retarding Device.	Without Retarding Device.
4 x 5	\$ 8 00	\$6 50	\$ 9 00	\$7 50
5 x 8	9 00	7 50	10 00	8 50
$6\frac{1}{2} \times 8\frac{1}{2}$	10 00	8 50	10 00	9 50

THE BAUSCH & LOMB STEREOSCOPIC SHUTTER.

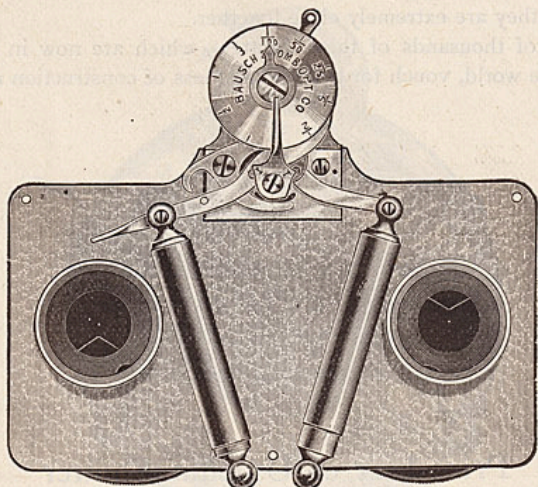


Figure shows Stereoscopic Shutter two-thirds actual size.

In designing this shutter we have applied the desirable features of the Iris Diaphragm Shutter, the actuating mechanism and pneumatic retarding device being the same. The exposure is made by two thin rubber blades opening vertically, the openings being diamond shaped. The opening and closing of the leaves is absolutely synchronous, thus making both pictures exactly alike.

The centers of the openings are $3\frac{1}{8}$ inches apart. The speed regulator gives all speeds from one one-hundredth of a second to three seconds. Time exposures of any desired duration over three seconds may be made with the pneumatic release or finger release, as desired.

Where extremely rapid exposures are required, the shutter blades will be made to open horizontally, with a rectangular opening across the entire aperture, becoming slightly wedge-shaped at full opening. This form is supplied only on special order.

The Stereoscopic Shutter is screwed directly to the front board of the camera.

We can assume no responsibility as to satisfactory fitting unless the lenses to be used with the shutter are sent here to be fitted.

Price \$18.00, fitted to lenses.

The Stereoscopic Shutter may be fitted to the following sizes of our lenses.

Extra-rapid Universal.	Rapid Universal.	A. G. Clark.	ZEISS ANASTIGMAT.			
			Series II.	Series IIa.	Series III.	Series IIIa.
No. 00	No. 5	No. 5	No. 2	Nos. 2 & 3	Nos. 2 & 3	Nos. 2 & 3

THE BICHROMATE OF POTASH RAY FILTER.

The Ray Filter is, as its name implies, a light filter for the purpose of absorbing, from the light which reaches the lens, certain rays the presence of which would render the making of a natural picture with true color values, clouds, and perspective impossible.

The Ray Filter prevents over-exposure of the sky, and gives not only the correct gradation of shading from zenith to horizon, but reproduces clouds and the detail in the clouds as well.

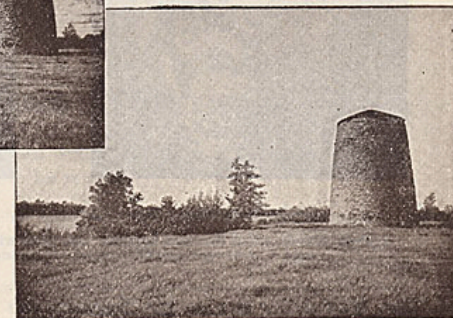
The Ray Filter gives the true color value of all objects in the picture. The artist, in drawing or painting, depends entirely on color values to individualize objects and develop their proper relative position. The photographer, in

order to overcome the tendency to flatness in his monochrome picture, must reproduce color values with the greatest possible accuracy.



A Rayfiltergraph.

The two views of the same scene, one made with the Ray Filter and the other an ordinary photograph, are introduced to demonstrate practically the value of the Bichromate of Potash Ray Filter in landscape work.



A Photograph.

The Ray Filter prevents halation by absorbing the rays which cause the halation, hence non-halation plates may be dispensed with when it is employed.

The Ray Filter improves the defining power of the lens by absorbing those rays for which the average lens is not well corrected.

The Ray Filter gives distinct pictures of distant objects, such as mountain peaks, which cannot be photographed at all without it, by absorbing the highly refractive rays which cause the blurry mist that fills up the distance in ordinary photographs of mountainous country.

In short, the Ray Filter is the equalizer which compensates for the super-sensitiveness of the photographic plate to ultra-violet, violet, and blue light, and its lack of sensitiveness to the red.

In Europe the Ray Filter has been known and used in a crude form for many years, and European as well as American photographers have not been slow to take advantage of the improved Bichromate of Potash Ray Filter.

Our Ray Filter consists of two thin pieces of optical glass, the surfaces of which have been ground perfectly plane and parallel. Between these plates is cemented a glass ring of uniform thickness throughout, thus forming a cell in which the Bichromate of Potash solution is contained. The glass part is mounted in a neat metal ring, which protects it.

The glass cell and mounting forms the basis for the most practical ray filter which can be made for the three-color photo-engraving process, as the cells may be filled with fluids of any desired color, and the shade can be varied easily and indefinitely by diluting or strengthening the solutions. Furthermore, the liquid color screen does not degenerate as film screens do. We have furnished a considerable number of cells for this purpose, and they give excellent satisfaction.



A Rayfiltergraph.



A Photograph.

Both pictures are of the same bouquet; one made with the Ray Filter, the other without, and demonstrate the effectiveness of reproducing color values correctly.

The Ray Filter fits on the front of the lens exactly as a cap does. It is therefore in the most convenient position in case it is desired to remove it for any purpose.

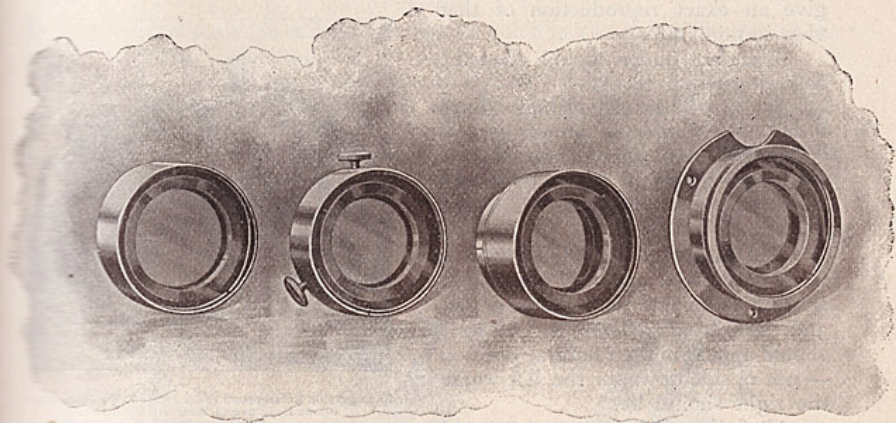
The Ray Filters are made in four forms: style "A," in which the portion of the mounting which fits upon the hood of the lens is lined with cork. This form must be fitted to the lens for which it is intended, and it is therefore necessary when ordering style "A" to send the exact measure of the circumference of the lens hood.

Style "B" is similar to style "A," except that, instead of a cork lining for holding the filter upon the lens hood, it has three binding screws so that it may be fitted to lenses varying in size from the diameter given in table to one-half inch smaller.

The No. "1 P" Ray Filter is like style "A," except that it is the proper size to fit the 4 x 5 or 5 x 8 Folding Kodak, Premo, Poco, Montauk, Sunart, and other camera lenses, '98 model, and is not lined with cork, and it is only necessary to specify the lens for which it is intended.

The No. "1 FF" is intended for box cameras with fixed focus lenses, in which the lens does not have a mounting projecting beyond the front of the

camera. The Ray Filter is mounted in a metal ring which slips into an extra flange. The flange has three screws by which it is fastened to the front of the camera. The Ray Filter may thus be used on the camera, and quickly removed when desired.



Style A.

Style B.

Style 1P.

Style 1FF.

Price-List of Bichromate of Potash Ray Filters.

Each filter is packed in a neat box, with a bottle of fluid, and pipette for refilling.

Number.	Inside Diameter in Inches.	Price.	Price of Morocco Cap.
1P	1 $\frac{3}{8}$	\$ 3 25	\$ 70
1FF	1 $\frac{3}{8}$	3 25	75
1	1 $\frac{3}{8}$	3 25	70
2	1 $\frac{3}{4}$	3 50	70
3	2 $\frac{1}{8}$	3 50	75
4	2 $\frac{1}{8}$	4 00	80
5	2 $\frac{1}{2}$	4 50	90
6	3 $\frac{3}{8}$	5 00	1 00
7	3 $\frac{1}{2}$	5 50	1 10
8	4 $\frac{1}{2}$	6 00	1 20
9	4 $\frac{3}{4}$	8 00	1 35
10	5 $\frac{1}{2}$	10 00	1 50

When ordering style "A" Ray Filter, send strip of good paper just reaching around the hood of the lens.

THE ICONOSCOPE.

Description. The purpose of a finder is to give a reduced image of that portion of the view of which a photograph is desired. It should, therefore, give an exact reproduction of that view in miniature.

A perfect finder should meet the following requirements:

What a Finder Should Be. The image should have the same proportions as the plate in the camera. The angle of view of the finder should be the same as that of the lens in the camera.

The image should be so bright as to be easily seen under all conditions, sharply defined to the extreme edges, and free from reflections. Objects should appear in their natural position—not upside down, or the left where the right should be.

All finders heretofore constructed

What Other Finders Are. have been lacking in several or all of the above respects, giving a very dim, poorly defined, reversed or inverted image, reflections interfering with the distinctness of the image, image projected vertically or horizontally so that the operator is forced to assume an unnatural and unsteady position in order to watch the image, a fatal defect for hand camera work.

Importance of a Finder. Since for the majority of work, and for all hand camera work, one is absolutely dependent upon what he sees in the finder, the existence of any of these defects should be sufficient to bar it out of the list of efficient photographic accessories.

Iconoscope, the Ideal Finder. The Iconoscope is an instrument of precision, constructed on correct optical principles, and possesses none of the defects mentioned above, even in the smallest degree. It is, therefore, the ideal finder.

Elegant Appearance. Particular care has been given to the mechanical construction. Accuracy, convenience, stability, and pleasing appearance have been so combined that the Iconoscope is a decided addition to the appearance as well as the effectiveness of any camera.

Brilliant Image. The image is even more brilliant than the actual objects appear to the eye, being formed by a concave lens which projects the picture through a solid glass prism direct to the eye. One sees with the Iconoscope all that is visible to the eye alone.

Sharply Defined and Rectilinear. The image is as sharp and clear as that formed by a good photographic lens, and is perfectly rectilinear, so that not only the objects as a whole may be clearly seen, but every detail, position, or expression as well.

Not Reversed or Inverted. The image is not reversed or inverted, hence objects appear in their natural position.

Convenience in Use. The adjustable hood prevents all reflections and permits the image to be viewed without shading the instrument. It is held in the proper position by a spring click. The image is projected at a convenient angle, so that the photographer stands in a natural position and easily glances from the image to the object without moving the head.



Photographic Enlargement of the Image in the Iconoscope Shows Definition to Margin of Field and Rectilinear Image.

Perfect Mounting. The mounting of the Iconoscope is extremely ingenious, and, being of metal throughout, forms a perfect protection for the glass parts without undue weight.

The mounting proper is attached to a small metal slide piece ("S" Fig. 3) by a spring hinge, so that, whether the camera is used for vertical or horizontal pictures, the Iconoscope is always vertical.

The slide works in a metal bed-plate which is attached by screws to the bed of the camera.

One Iconoscope for Several Cameras. The Iconoscope may thus be instantly detached if desired, or by having several bed-plates may be used on any number of cameras with equal facility.

The Iconoscope is made in three sizes, in each of which the proportions of the image are exactly the same, although varying in size. The larger sizes, therefore, give larger images, and permit a more precise judgment of a view. The smallest Iconoscope is applicable to and may be conveniently enclosed in the smallest folding hand cameras to which ordinary finders are fitted.

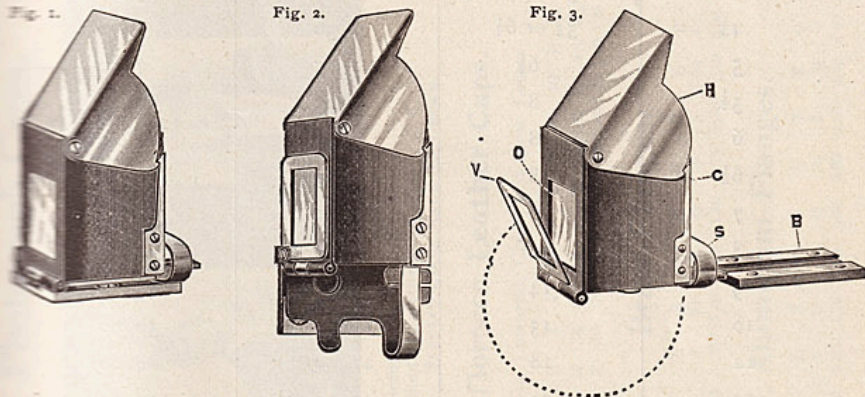


Fig. 1. Iconoscope as ordinarily used.

Fig. 2. Iconoscope in position for vertical view.

Fig. 3. Diagram showing the use of parts of the Iconoscope.

H. Hood. The hood may be folded down flat when the camera is closed.

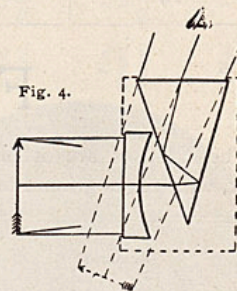
B. Bed-plate attached to the camera bed by screws.

S. Slide piece attached to the Iconoscope and sliding in the groove of B, so that the Iconoscope can be instantly removed from the camera if desired.

V. Vertical attachment consisting of a metal plate with oblong opening, and hinged to the base of the Iconoscope. The vertical attachment when swung up in front of the opening O gives vertical pictures (Fig. 2), and is folded under the Iconoscope out of the way when the full aperture of the instrument is desired as for horizontal pictures (Fig. 1).

C. Spring Click which holds the hood in position.

Fig. 4. Diagram showing path of a ray of light through the Iconoscope, and the angle and apparent position of the projected image.



PRICE-LIST OF ICONOSCOPES.

Each Iconoscope is furnished in a neat box.

Size A . . .	Height, 1 1/2 in. . .	Width, 1 1/2 in. . .	Depth, 1 1/2 in. . .	Each, \$5 00
Size B . . .	" 1 1/4 " . . .	" 1 1/4 " . . .	" 1 1/4 " . . .	" 5 50
Size C . . .	" 2 " . . .	" 1 1/4 " . . .	" 1 1/4 " . . .	" 6 00
Extra Bed-plates				" 75

Condensing Lenses.

The Condensing Lenses listed below are accurately ground and polished, and will be found much superior to the imported lenses commonly employed for this purpose. When condensers are wanted mounted, we supply them in our improved mounts, which are so constructed that there is the least possible danger of the lenses breaking when heated. The mountings are also very neat and compact.

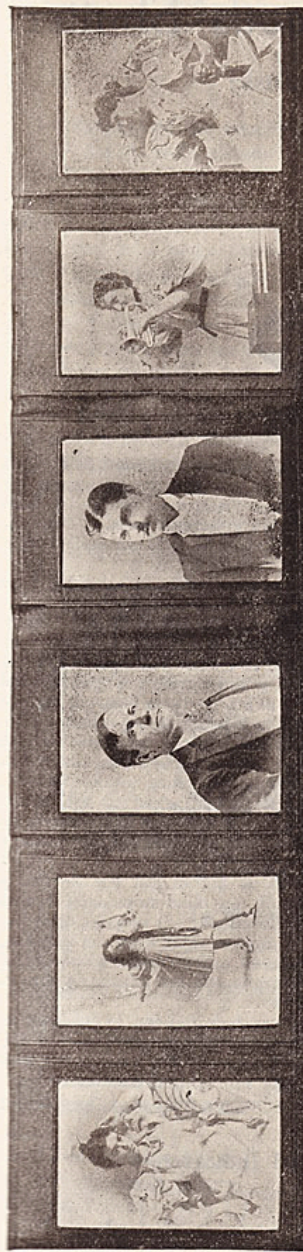
Diameter. Inches.	Focus. Inches.	One Lens. Unmounted.	Pair of Lenses. Mounted.
4	5½ or 6½	\$ 1 25	\$ 4 00
4½	5½ or 6½	1 35	5 00
4½	5½ or 6½	1 50	6 00
5	6½	1 75	7 50
5½	8	2 25	9 00
6	8	3 00	12 00
6½	8	4 00	18 00
7	9	5 75	24 00
8	12	7 50	32 00
9	14	10 00	40 00
10	15	13 50	50 00
12	18	27 00	80 00
14	21	40 00	120 00

Finder Lenses.

These lenses are of first quality, and are furnished either double or plano-convex, with edges ground or unground.

No.	Diameter.	Focus.	Price, with Edges Unground.	Price, with Edges Ground.	Telegraphic Code.
1	¼ in.	⅝ to 2 in.	\$0.40 each.	\$0.60 each.	Idnel.
2	⅜ "	¾ " 2 "	.40 "	.60 "	Igal.
3	½ "	1 " 2 "	.40 "	.60 "	Ivam.
4	⅝ "	1½ " 3 "	.40 "	.60 "	Ishod.
5	¾ "	1½ " 3 "	.50 "	.70 "	Ithai.
6	⅞ "	2 " 3½ "	.50 "	.70 "	Irah.
7	1 "	2 " 4 "	.50 "	.70 "	Isui.

Photograph Cases.



\$1.50
2.00

Cabinet, leather, to hold six pictures.
Cabinet, Mantel, leather, to hold six pictures.
SPECIAL SIZES MADE TO ORDER.

Morocco Leather Caps.

For Universal, Clark, and Zeiss Lenses.

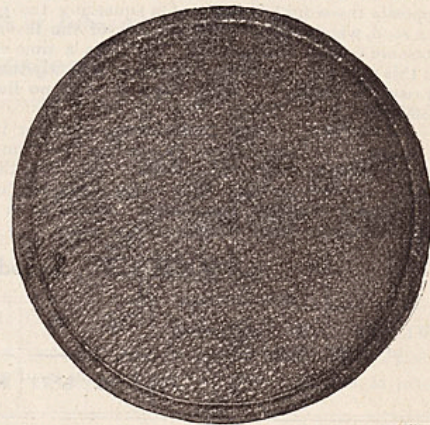
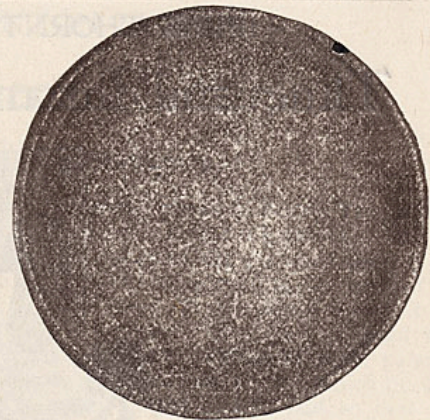
No.	1	2	3	4	5	6	7	8	9	10	11	12
Diam.,	1½	1¾	2	2½	2¾	3	3½	4	4½	5	5½	6
Price,	\$0.60	.65	.70	.75	.80	.90	1.00	1.10	1.20	1.25	1.50	1.75

Brass Flanges.

No.	1	2	3	4	5	6	7	8	9
Diam.,	1½	2	2½	3	3½	4	5	5½	6
Price,	\$0.50	.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00

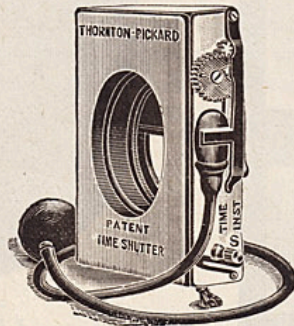
Aluminum Flanges.

No.	1	2	3	4	5	6	7	8	9
Diam.,	1½	2	2½	3	3½	4	5	5½	6
Price,	\$1.00	1.25	1.50	2.00	2.50	3.00	3.50	4.00	4.50



THE THORNTON-PICKARD

Time and Instantaneous Shutter.



Standard Pattern.

To fit on either the hood or tube of the lens. Particulars of the smallest size: speed, up to $\frac{1}{10}$ of a second; dimensions, $3\frac{3}{8} \times 2\frac{1}{4} \times \frac{7}{8}$ inches; weight, $4\frac{1}{2}$ ounces.

The above illustration shows the external appearance of the THORNTON-PICKARD Time and Instantaneous Shutter, which is the one recommended for general all-round work. The shutter is simplicity itself: there is no complicated mechanism to get out of order. It is a perfect substitute for the lens cap, and much more handy and reliable.

The same shutter may be used with any number of lenses, of different sizes, by the use of our Patent Adapters (price from 30 cents each).

For an Instantaneous Exposure place the lever opposite the word "INST." The cord is then pulled out as far as it will come by means of the tassel, which causes the wheel to revolve until the second stud catches in the notch of the lever, making two clicks. The pulling of the cord winds up the blind on the top roller, so that the opaque bottom end covers the opening, and consequently the lens. If now the pneumatic ball is pressed, it will lift the lever clear of the stud and release the wheel, allowing the blind to rapidly rewind upon the bottom spring roller. The aperture in the blind therefore passes rapidly across the opening in the shutter case, which is instantly covered again by the opaque end of the blind. The exposure thus given is an instantaneous one.

The Duration of the Exposure can be ascertained by reference to the SPEED INDICATOR. This consists of a dial, marked in fractions of a second, attached to the side of the shutter, and a pointer on the end of the spring-roller spindle. The speed is indicated on the dial in fractions of a second by the pointer, which can be set to the speed desired by means of the knob.

For Time Exposures the cord is pulled to its limit as before, but the lever is placed opposite the word "TIME." On squeezing the pneumatic ball, the blind stops open by means of the stud, which catches in the notch of the lever, as before described. It remains open until the pressure on the ball is released. Thus a time exposure of any required duration may be given. In this case the exposure commences instantly the ball is squeezed, and terminates immediately the pressure is released. Beyond this there is no limit to the duration of the exposures that may be obtained.

For Very Long Exposures, such, for instance, as are required for INTERIORS, there is no necessity to hold the ball all the time. Without first setting the shutter pull the cord *half-way*, that is, until the first click is heard. This sets the shutter full open; and it may be left so for the desired time of exposure, after which it can be closed by simply squeezing the ball.

For Focusing, the shutter remains open in the same manner, that is, if the cord is pulled only half-way,—until the first click is heard.

PRICE LIST, including Speed Indicator.

To fit on a lens hood or tube up to inches diameter:	1½	1⅝	2	2½	3	3½	4	4½	5
	\$7.50	\$7.75	\$8.00	\$9.50	\$11.00	\$13.00	\$15.00	\$17.50	\$19.00

THE THORNTON-PICKARD

Behind Lens Shutter,

Time and Instantaneous.

Particulars of the smallest size: price, including speed indicator, \$10; speed, up to $\frac{1}{10}$ of a second; dimensions, $3\frac{3}{8} \times 2\frac{1}{4} \times \frac{7}{8}$ inches; weight, $4\frac{1}{2}$ ounces.

This shutter is of exactly the same construction as the standard pattern described in the preceding pages, but is arranged to be screwed to the panel of the camera front, practically acting as an inside shutter. It then forms a part of the camera, and is always firmly attached and in position. The back is fitted with velvet, which insures a light-tight joint when the shutter is screwed to the panel of the camera front. The lens flange is screwed to a detachable panel, which fits into the front of the shutter. Extra panels for other flanges may be had, so that any number of lenses may be used with the same shutter, and any one instantly dropped into its place ready for immediate use.

The shutter should be attached to the camera front panel by four ordinary small screws passed through from the back of the panel into the velvet-covered back of the shutter. Care should be taken that these screws are not too long, so as to injure the blind.

PRICE LIST, including Speed Indicator.

	1½	1⅝	2	2½	3	3½	4	4½	5
Behind Lens.	\$8.25	\$8.52	\$8.80	\$10.45	\$12.10	\$14.30	\$16.50	\$19.25	\$20.90

THE THORNTON-PICKARD

Stereoscopic Shutter,

Time and Instantaneous.

To fit on the Hoods or Tubes of Lenses.

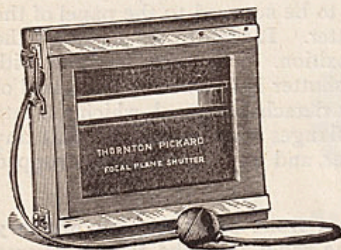
STEREOSCOPIC.

	1½	1⅝	2	2½					
Time and Instantaneous, . . .	\$12.50	\$12.50	\$13.50	\$15.00	—	—	—	—	—
Time and Instantaneous Behind Lens,	14.00	14.00	15.00	16.50	—	—	—	—	—
Time and Instantaneous Behind Lens, with adjustable centres (adjustment from 2¼ to 3½ in.),	16.50	16.50	17.50	19.00	—	—	—	—	—

These prices are for stereoscopic shutters up to 3½ inch centres. If 3½ inch centres, \$1 extra; 4 inch centres, \$2 extra.

THE THORNTON-PICKARD Focal Plane Shutter,

With Patent Adjustable Slit. Fits at the Back
of the Camera.



Particulars of the smallest size: price, including speed indicator, \$19.50; speed (all sizes), $\frac{1}{10}$ up to $\frac{1}{1000}$ of a second; dimensions, $6\frac{1}{2} \times 7\frac{1}{4} \times 1\frac{3}{8}$ inches (not including adapters); weight, 12 ounces.

For those who desire to obtain instantaneous photographs of subjects having an extremely rapid movement, such as flying birds, animals and men leaping, jumping, etc., this is the best shutter. It gives a short exposure, and passes a larger percentage of light than any other form.

The Focal Plane Shutter is made upon the roller-blind principle, like all the Thornton-Pickard shutters. It fits at the back of the camera, and the dark slide fits into the back of the shutter. The shutter blind, therefore, works just in front of the plate, and has a narrow slit in it the full width of the plate, which gives the exposure as it passes rapidly across.

The speed is regulated by means of a small knob that winds up the driving spring, and also by altering the width of the adjustable slit. The speed indicator is always fitted to this shutter.

The winding indicator is an arrangement which automatically prevents the blind being wound up too far when setting the shutter, and will be found on the opposite side of shutter from the winding knob. When it is required to focus, wind the blind up as far as it will go, then press the spring lever over the winding indicator with the finger of the other hand, and continue the winding.

For prolonged exposures the shutter is wound up to the top as when focusing, and a cap or a time shutter may be used in the ordinary way without removing the Focal Plane Shutter from the camera.

THE NEW PATENT ADJUSTABLE SLIT is fitted to all Focal Plane Shutters, in addition to the adjustable spring roller, without extra charge. This improvement adds greatly to the range of speed of the shutter, extending from $\frac{1}{25}$ of a second to $\frac{1}{1000}$ of a second in all sizes of shutters, and allowing not only for the fastest instantaneous work possible, but also for all ordinary instantaneous work down to the slowest. This simple and ingenious invention is the only practical and perfect method which has yet been devised for varying the width of the slit in a Focal Plane Shutter. It is done by means of a chain at each end of the slit, which can be lengthened and shortened at will, making the sides of the slit perfectly parallel without any skill in manipulation.

DIRECTIONS FOR ALTERING THE WIDTH OF SLIT. After removing the focusing screen take hold of the two struts which form the parallel sides of the slit in the blind, and turn them askew, at the same time drawing them forward out of the shutter. The chains at the ends of the slit can then be manipulated. It will be observed that one end of the chain is fixed permanently to one strut, while the other part of the chain is linked on to the extreme end of the other strut, the end of it passing inwards along the length of the strut. This part may be pulled out and linked on to the end of the strut to make the slit wider, or allowed to spring back into the strut, which makes the slit narrower. All that is necessary is to see that the same number of links are used at each end of the slit.

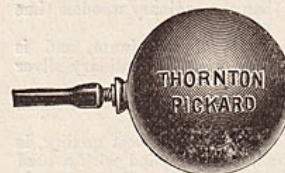
THE SPEED OF THE SHUTTER is found by DIVIDING THE SPEED GIVEN ON THE INDICATOR BY THE NUMBER OF LINKS IN USE at each end. That is to say, with only one whole link the speed is that given on the indicator; with ten links (which is the extremity), it is one-tenth of the same.

PRICE LIST.

4 x 5 in.	4 $\frac{1}{2}$ x 6 $\frac{1}{2}$ in.	5 x 7 in.	5 x 8 in.	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$ in.	8 x 10 in.	10 x 12 in.	11 x 14 in.
\$18 00	\$20.00	\$20.00	\$23.00	\$25.00	\$28.00	\$33.15	\$35.00

Other sizes made to order.

THE THORNTON-PICKARD Pneumatic Balls and Tubes.



The rubber of which these goods are made is the best that can be obtained for the purpose, and, although no rubber goods will last indefinitely, these balls and tubes will last a long time with ordinary care.

The balls and tubes supplied by us are all specially made for our shutters, and make the shutters work very easily. They are much better than anything obtainable from other sources.

The ball is joined to the tube by an air-tight screw connection, so that should the ball ever become deflated it can be unscrewed. The ball will then instantly refill with air, and after screwing up tight again is ready for use. The end of the rubber tube overlaps the metal connection so as to be squeezed between the two parts of the connection when screwed up, therefore making its own air-tight joint, as shown in the above illustration.

PRICES.

Ordinary pattern, as supplied with every Thornton-Pickard Shutter, 2 feet of tubing, and not joined up air-tight, **75 cents** each.

Extra teats, 12 cents each. Screw connections, 12 cents per pair (these can be used for joining two short lengths of tubing together).

Note.—When ordered we supply the long tubing with a screw connection, so that it may be attached to the short length already on the shutter by simply unscrewing the small ball. Thus either the long or short lengths are readily interchangeable.

THE THORNTON-PICKARD Rubber Moulding and Adapters,

For fitting Shutters to Lenses and for adapting One
Shutter to Two or More Lenses.

Made in seven different thicknesses. Price, 30 cents per foot.

No.	1	2	3	4	5	6	7
	$\frac{1}{16}$ "	$\frac{3}{32}$ "	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{1}{2}$ "	$\frac{7}{16}$ "	$\frac{1}{4}$ " thick.

Fitting.—It should be cut to the required length with a sharp knife, and sprung into the aperture with the rib or flange on the inside.

Adjustment.—The screw in the side of shutter will give the exact adjustment by turning with a screw-driver. An accurate fit upon the lens hood is thus insured.

Any thickness may be rubbed down on the back with a piece of sandpaper when too thick, or in case of emergency a piece of cardboard may be used as packing behind the moulding when it is not thick enough.

ADAPTERS.

When it is desired to fit two or more lenses to the same shutter, a second piece of moulding may be used inside the first one, so as to form an adapter which can be put in or taken out as required. **Price, 30 cents each.**

In case a very large shutter has to be adapted to a very small lens, a wooden adapter is necessary. **Price, 75 cents** up to 2 $\frac{1}{4}$ inches diameter, and \$1.00 if larger.

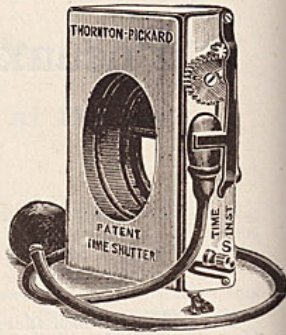
The Thornton-Pickard Aluminum Shutter.

The above has been introduced to meet the requirements of those who wish a cheaper shutter than the ordinary wooden time and instantaneous pattern.

The case of the shutter is made of aluminum, and is consequently very light. It is supplied with the ordinary silver or with black finish.

N.B.—All orders are executed with the ordinary silver finish unless otherwise specified.

The pneumatic ball and tube, of our special best quality, is fitted to the shutter; but, if desired, it is supplied with a cord release instead. This is sometimes preferred when the shutter is required for fitting into a hand camera.



Prices of the Thornton-Pickard Aluminum Shutter.

Time and Instantaneous, silver finish, with pneumatic ball and tube release,	1½ in.	1¾ in.	2 in.	2½ in.
	\$7.50	\$7.75	\$8.00	\$9.50

For hand cameras these shutters are specially made to order, at the same prices, but with black finish instead of silver finish, and mechanical instead of pneumatic release. The ordinary pattern and finish only kept in stock.

When ordering, please say whether the ordinary silver or the black finish is required, also whether the shutter is to be fitted with speed indicator. Please send a strip of paper that just meets round the hood or tube of the lens upon which the shutter is required to fit.

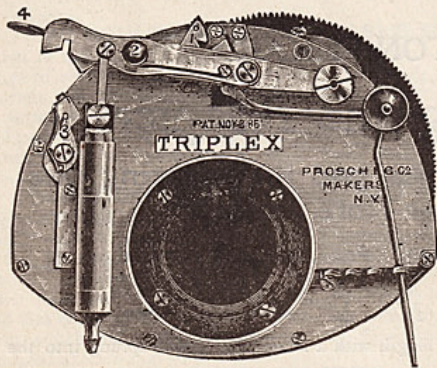
For those requiring a cheap article there is nothing in the market to equal this new metal shutter; but where beautiful finish and appearance are desired, such as can only be obtained with a French polished mahogany case, we strongly recommend our standard patterns, which give such universal pleasure and satisfaction.

The Triplex Improved Shutter.

The Triplex Improved being fitted between the combinations of the lens, each shutter also contains an entirely new lens tube, the original lens tube or barrel not being cut in any way, unless specially ordered, but returned intact.

Rotary stops are fitted to all shutters, when possible. Shutters may also be adapted for use with Waterhouse or plain stops, same price.

We prefer, under all circumstances, to have lens tube, and do not guarantee fit unless we have complete lens.



PRICE LIST OF TRIPLEX IMPROVED SHUTTERS.

Size,	00	0	0A	1	1A	2	2A	3	3A
Aperture, in.,	1/16	1/8	1/4	1/2	3/4	1	1 1/4	1 1/2	2
Price,	\$12.50	\$13.00	\$13.50	\$14.00	\$15.00	\$15.50	\$16.00	\$17.00	\$18.00
Extra for aluminum,	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00
	4	5	6	7	8				
	2 1/4	2 1/2	3	3 1/2	4				
	\$20.00	\$22.00	\$26.00	\$30.00	\$35.00				

N. B.—When the lens combinations come so close together that it is necessary to fit stop *inside of shutter case*, an extra charge of \$1.00 is made.

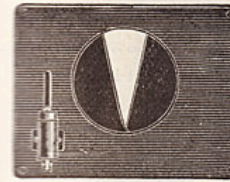
Triplex Stereoscopic Shutter.

It is simply a double Triplex Shutter in one frame, operated by one lever bar.

Prices: No. 1, \$20.00 No. 2, \$22.00 No. 3, \$23.50 No. 4, \$25.00

Low Shutter, No. 3.

Price, \$4.00 each.



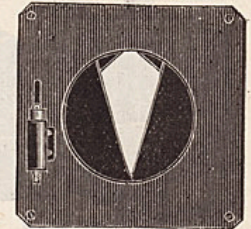
1½ in. opening	by 2 7/8 in. wide	by 3 3/8 in. long.
1 1/4 " "	" 3 1/8 " "	" 4 1/4 " "
2 " "	" 3 1/2 " "	" 4 1/2 " "
2 1/4 " "	" 4 3/8 " "	" 5 1/8 " "
3 1/4 " "	" 5 3/8 " "	" 7 1/4 " "
3 1/2 " "	" 6 1/2 " "	" 7 3/4 " "
4 " "	" 7 1/2 " "	" 9 " "

The Low Shutter, No. 3, is designed to be attached to the front board on the *inside* of camera.

It opens so as to light the drapery and foreground most. Will balance open while focusing.

Low Shutter, No. 5.

1½ in. opening, 3 in. square,	\$4.00
1 1/4 " " 3 1/2 " "	4.00
2 " " 4 " "	4.50
2 1/4 " " 4 3/4 " "	4.50
3 " " 5 1/2 " "	5.00
3 1/4 " " 6 3/4 " "	5.50
4 " " 7 1/4 " "	6.00
4 1/2 " " 8 1/4 " "	6.50
5 " " 9 " "	7.00

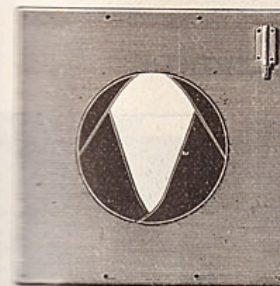


The Low Shutter, No. 5, is a very simple, well made, and nicely finished shutter, having the special advantage of a very large opening in a small shutter.

Packard Time Shutter.

This shutter has four wings, and has the advantage of a **very large opening** in connection with very small outside dimensions. It is intended for time exposures, works very evenly and accurately, is placed on the inside of the camera.

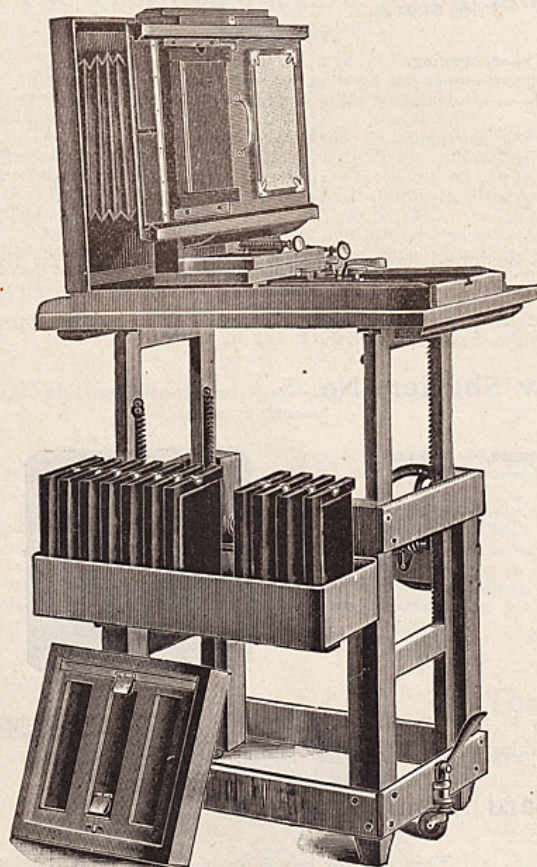
For cameras having small front boards this shutter is especially adapted.



SIZES AND PRICES.

Outside Dimensions,	Price.
4 1/4 in.,	\$4.50
5 " "	4.50
6 " "	5.00
7 " "	5.50
8 " "	6.00

New York Studio Outfit.



This outfit is, without exception, the most complete and the cheapest for the studio. It includes:—

One 8 x 10 mahogany portrait camera, fitted with double swing back and patent lever focusing attachment, curtain slide Benster holder, and an automatic cabinet attachment, with one holder, by means of which in one movement the ground glass is pushed aside and holder placed in position with slide automatically drawn, ready for exposure; also one No. 1 New York Camera Stand.

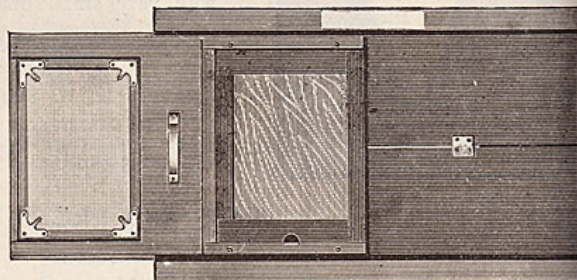
Size.	Price.
8 x 10 New York Studio Outfit, complete as above,	\$45.00
11 x 14 New York Studio Outfit, complete as above,	70.00

EXTRA HOLDERS.

4 1/4 x 6 1/2, 5 x 7, or 5 x 8,	\$1.20
11 C. Camera alone,	21.00
13 C. Camera alone,	50.00

Automatic Cabinet Attachment.

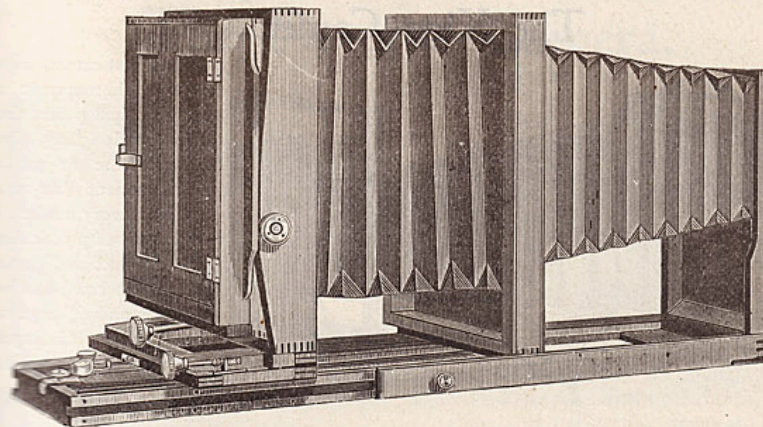
It consists of a mahogany back that can be fitted to any 8 x 10 or larger camera, and has a ground glass and receptacle for plate holder on a sliding carriage which moves from left to right. The plate holder being adjusted, and the focusing being done, the carriage is moved and the ground glass is replaced by the plate holder, the slide being automatically withdrawn.



The automatic attachment will be made to fit any 8 x 10, 10 x 12, or 11 x 14 camera. It fits the camera where the ordinary holder is adjusted. 5 x 8, 5 x 7, or 4 1/4 x 6 1/2 holders are supplied, as desired.

	Price.
8 x 10 attachment, with one holder,	\$10.00
10 x 12, or 11 x 14, with one holder,	12.00
Extra (single) holders, per dozen,	14.40

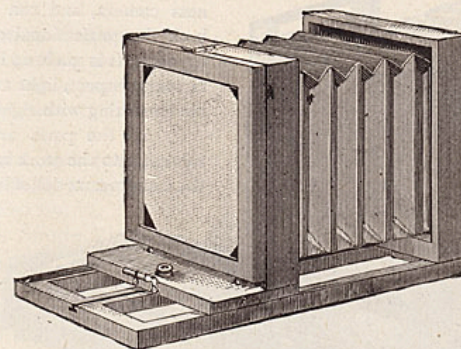
Eclipse Portrait Camera.



Size.	To cover Plate.	With Double Swing-back.
1-4	3 1/2 x 4 1/2 in.	\$20.00
1-2	4 1/2 x 5 1/2 "	27.00
	4 1/2 x 6 1/2 "	30.00
4-4	6 1/2 x 8 1/2 "	35.00
4-4	8 x 10 "	38.00
	10 x 12 " with platform 30 in. long,	48.00
	11 x 14 " " 36 " and vertical shifting front,	64.00
	12 x 15 " " 48 " " " " "	72.00
	14 x 17 " " 60 " " " " "	76.00
	16 x 20 " " 65 " " " " "	88.00
	17 x 20 " " 65 " " " " "	90.00
	18 x 22 " " 70 " " " " "	100.00
	20 x 24 " " 72 " " " " "	110.00
	22 x 27 " " 72 " " " " "	130.00
	25 x 30 " " 80 " " " " "	170.00
	30 x 38 " " 100 " " " " "	350.00

When ordering, please specify whether Waterbury or Bonanza Holder is preferred.

Acme Standard Portrait Cameras.

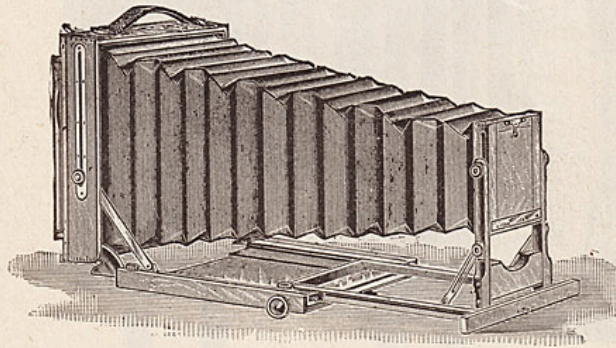


The Acme Portrait Cameras have rubber bellows, Swing ground glass, and reversible holder.

	Plain, with Solid Glass Corner Holder.	Double Swing-back, with Bonanza Holder
4-4 size, reversible, plate 3 1/2 x 4 1/2 in.,	\$8.00	—
" " " " 4 1/2 x 5 1/2 "	10.00	—
" " " " 6 1/2 x 8 1/2 "	14.00	\$24.00
" " " " 8 x 10 "	20.00	26.00
" " " " 8 x 10 " with focus rack,	22.50	28.00
" " " " 10 x 12 size, reversible, with focus rack,	25.00	33.00
" " " " 11 x 14 " " " "	35.00	45.00
" " " " 13 x 17 " " " "	45.00	55.00
Acme Standard Portrait Camera, with Sliding S. G. Cor. Holder,	19.00	—
8 x 10 " " " "	27.00	—

Swing glass corner or rabbeted dry plate holders supplied with these cameras.

The King Camera.



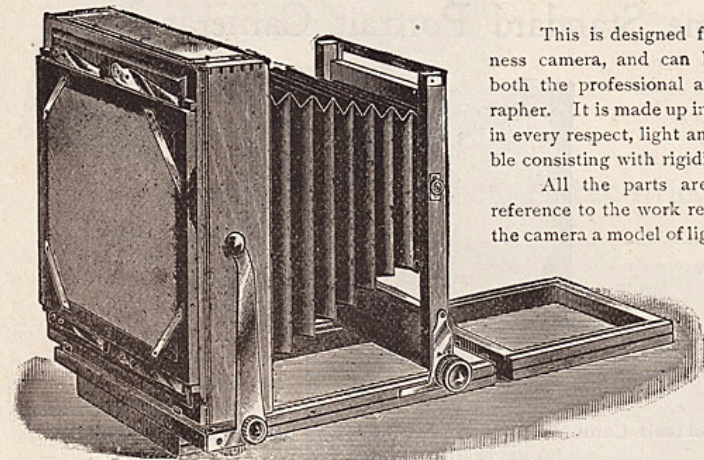
The best camera known to the photographic art. The principal points aimed at in the designing of this camera were to produce an instrument that would combine every modern improvement of practical utility; compact and portable as possible consistent with strength and rigidity; that should be simple in its parts, so as to avoid difficulties in use and liability to be easily put out of order.

The price of the KING includes one holder and canvas case.

When desired, cases will be furnished to hold camera and six holders, or camera, six holders, tripod, and pocket for lenses.

Size of View.	Price.
5 x 7 in.,	\$32.00
5 x 8 "	32.00
6½ x 8½ "	35.00
8 x 10 "	36.00
11 x 14 "	45.00

Rochester View Camera.



This is designed for a thorough business camera, and can be recommended to both the professional and amateur photographer. It is made up in a first-class manner in every respect, light and compact as possible consisting with rigidity.

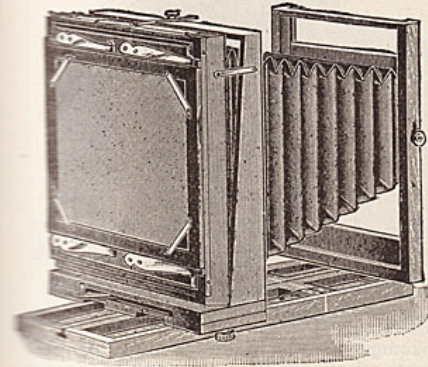
All the parts are made strong with reference to the work required, thus making the camera a model of lightness and strength.

Price includes canvas carrying case and one double plate holder.

Size of Plate.	Focal Capacity.	Price, Double Swing.
5 x 7 in.,	16½ in.	\$18.00
5 x 8 "	17 "	18.00
6½ x 8½ "	17½ "	20.00
8 x 10 "	20 "	22.00
10 x 12 "	21½ "	28.00
11 x 14 "	22½ "	30.00
14 x 17 "	23½ "	40.00
Stereo partition with lens board, extra		.75

Other sizes to order.

The Favorite Camera.



This is especially designed to meet the requirements of the outdoor professional, but can be used equally as well by the amateur or in the gallery.

It is made to cover the field of usefulness of all cameras, yet at a price within the reach of all.

The carrying case is canvas, made to hold the camera in one end and six holders in the other.

Price, including camera, canvas case, and one double dry plate holder:

Size.	Focal Capacity.	Weight.	Price.
5 x 7 in.,	13½ in.	3½ lbs.	\$16.00
5 x 8 "	15 " "	4 " "	16.00
6½ x 8½ "	15½ " "	5 " "	18.00
8 x 10 "	18½ " "	6½ " "	18.00
11 x 14 "	23 " "	10 " "	24.00
14 x 17 "	28½ " "	17 " "	30.00

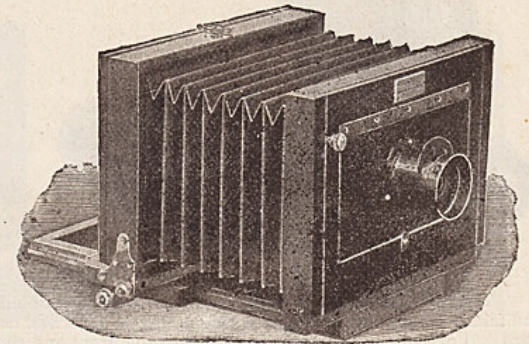
New Model Camera.

The NEW MODEL CAMERA is well known, it having been on the market for twelve years; and its popularity attests its merits.

It is very light and compact, making a desirable camera for a good but cheap outfit.

Price includes Single View Lens, Standard Folding Tripod, Carrying Case, and one Perfection Plate Holder (except 8 x 10, where neither lens nor tripod is included).

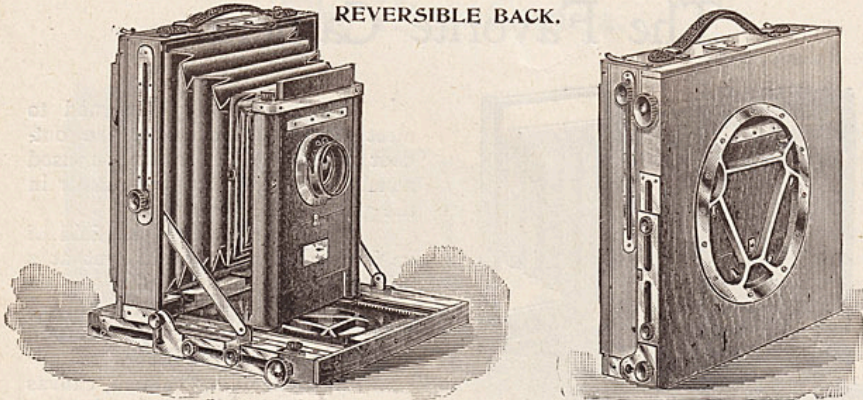
The carrying case will hold two extra plate holders.



Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.
3½ x 4½ in.	8½ in.	1½ lbs.	\$10.00
4 x 5 " "	9 " "	1½ " "	10.00
4½ x 6½ " "	9½ " "	2 " "	11.00
5 x 7 " "	11¼ " "	2½ " "	12.00
5 x 8 " "	12½ " "	2½ " "	12.00
6½ x 8½ " "	14 " "	2½ " "	15.00
8 x 10 " "	16 " "	5 " "	14.00

The Carlton Camera.

REVERSIBLE BACK.



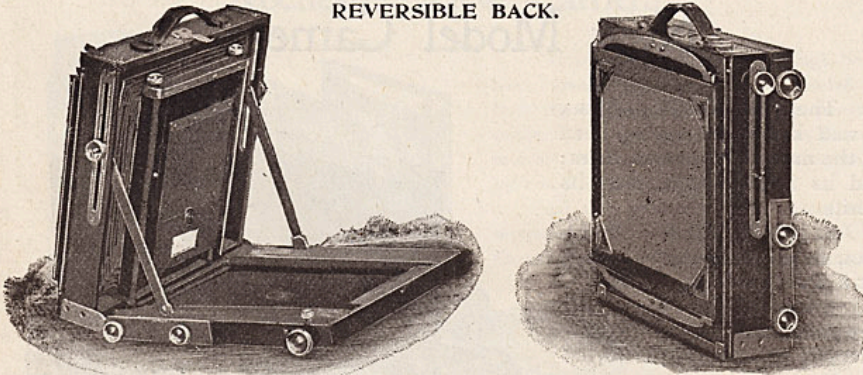
For the enthusiastic amateur and professional photographer who believes in having the very best of everything, the Carlton with its manifold features, adapting it to an almost infinite variety of work, will be found to fully meet their views.

The price includes one mahogany Perfection Holder, with rubber slides, mahogany combination tripod and canvas case, but no lens.

Size of View.	Focal Capacity.	Weight of Camera.	Double Swing.	Size of View.	Focal Capacity.	Weight of Camera.	Double Swing.
4 x 5 in.	13 in.	2½ lbs.	\$35.00	6½ x 8½ in.	20½ in.	7 lbs.	\$45.00
4½ x 6½ "	15½ "	4 "	36.00	8 x 10 "	24 "	9½ "	50.00
5 x 7 "	17 "	4½ "	40.00	10 x 12 "	26½ "	12½ "	55.00
5 x 8 "	19 "	5½ "	42.00	11 x 14 "	30½ "	15½ "	62.00

The Universal Camera.

REVERSIBLE BACK.



PARTIALLY FOLDED.

FOLDED.

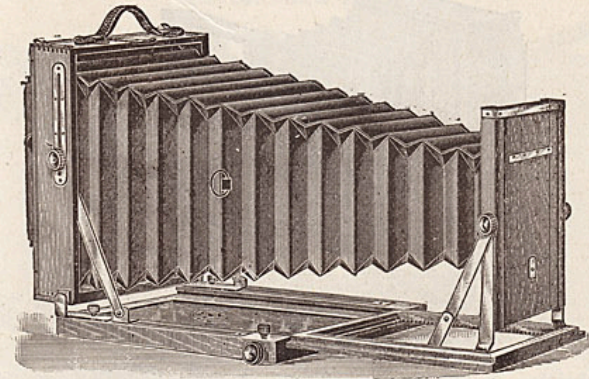
The **UNIVERSAL** is made with both single and double swing, has swinging front, and rising and falling front controlled by a spring acting in a ratchet, doing away with milled heads. The forward end of bellows is attached to the movable front and slides with it, thus avoiding a possibility of cutting off the rays of light.

Price includes canvas carrying case, one Perfection Holder, and combination tripod, but no lens. (With sizes above 11 x 14 English book-holder is supplied.)

Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.	Double Swing.	Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.	Double Swing.
4 x 5 in.	13 in.	2½ lbs.	\$28.00	\$30.00	8 x 10 in.	24 in.	7½ lbs.	\$40.00	\$43.00
4½ x 6½ "	15½ "	3½ "	30.00	32.00	10 x 12 "	26½ "	10½ "	45.00	48.00
5 x 7 "	17 "	3¾ "	33.00	35.00	11 x 14 "	30½ "	13¾ "	50.00	55.00
5 x 8 "	19 "	4½ "	35.00	37.00	14 x 17 "	36 "	21½ "	64.00	70.00
6½ x 8½ "	20½ "	5½ "	38.00	40.00	17 x 20 "	43 "	34 "	75.00	85.00

The Monitor Camera.

REVERSIBLE BACK.



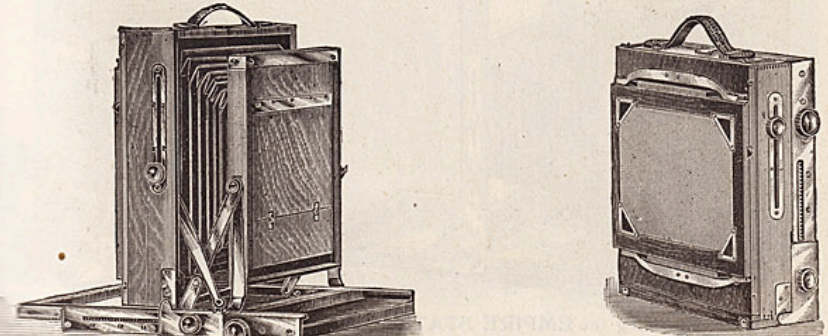
The **MONITOR CAMERA** is a new form of the compact style of view camera, and is similar in general appearance to the Carlton and Universal.

Price includes canvas carrying case, one Perfection, Jr., Holder, and combination tripod, but no lens.

Size of View.	Focal Capacity.	Weight of Camera.	Double Swing.
4 x 5 in.	13 in.	2 lbs.	\$24 00
5 x 7 "	17 "	3½ "	27 00
5 x 8 "	19 "	4½ "	30.00
6½ x 8½ "	20½ "	4¾ "	33.00
8 x 10 "	24 "	6½ "	36.00
10 x 12 "	26½ "	9½ "	40.00
11 x 14 "	30½ "	12 "	45.90

The Kenwood Camera.

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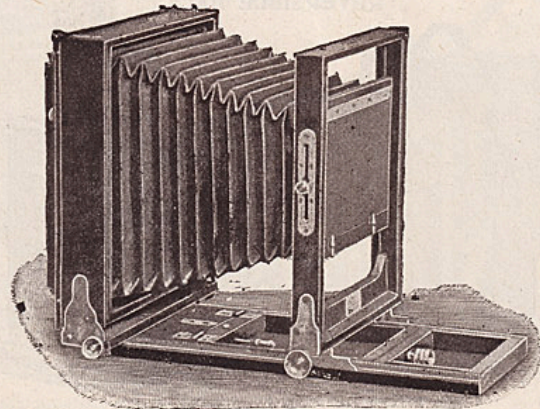


The **KENWOOD CAMERA** is another new form of the compact camera, its especial feature being the wide front for stereoscopic work.

Price includes canvas carrying case, one Perfection, Jr., Plate Holder, and combination tripod, but no lens.

Size of View.	Focal Capacity.	Weight of Camera.	Double Swing.
5 x 7 in.	17 in.	4½ lbs.	\$30.00
5 x 8 "	19 "	5½ "	33.00
6½ x 8½ "	20½ "	6 "	36.00
8 x 10 "	24 "	8½ "	40.00

The Ideal Camera. REVERSIBLE BACK.

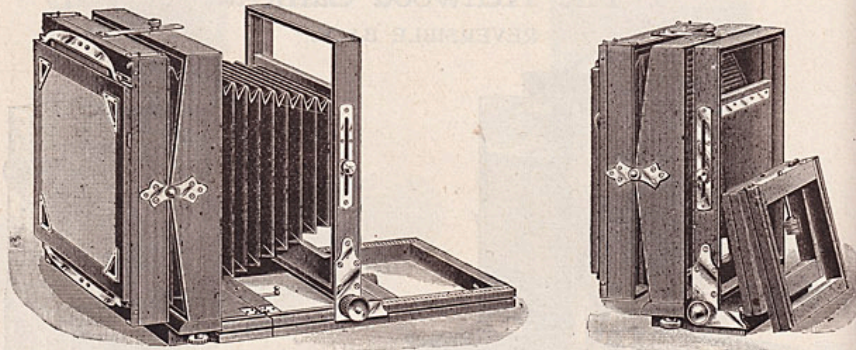


Taken in its entirety we can recommend the **IDEAL** to both the professional and amateur photographer.

Price includes one Perfection Plate Holder and canvas carrying case, but no lens or tripod. The carrying case will hold two extra plate holders.

Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.	Double Swing.
3½ x 4½ in.	9½ in.	2 lbs.	\$17.00	\$19.00
4 x 5 "	10 "	2½ "	18.00	20.00
4½ x 6½ "	11½ "	3 "	20.00	22.00
5 x 7 "	13½ "	4½ "	22.00	24.00
5 x 8 "	14½ "	4¾ "	24.00	26.00
6½ x 8½ "	14½ "	5½ "	26.00	28.00
8 x 10 "	21½ "	8 "	30.00	33.00

Empire State Camera.

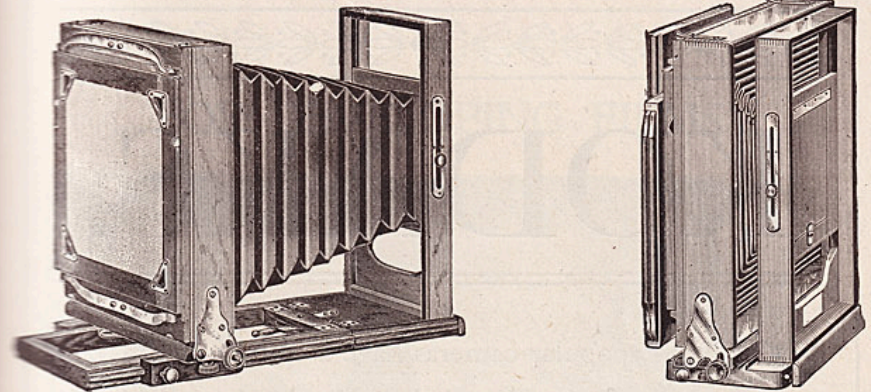


In recommending the **EMPIRE STATE** as a thoroughly practical camera in every particular, we feel that our claims will be even more than justified by an examination of the instrument itself, the price in no way conveying an idea of its merits.

Price includes canvas carrying case and one Perfection Holder, but no lens or tripod. The carrying case will hold two extra plate holders.

Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.	Double Swing.
5 x 7 in.	15½ in.	5 lbs.	\$17.00	\$19.00
5 x 8 "	16 "	5½ "	18.00	20.00
6½ x 8½ "	16½ "	5¾ "	20.00	22.00
8 x 10 "	19 "	7½ "	22.00	24.00
10 x 12 "	21 "	8¾ "	23.00	30.00
11 x 14 "	23½ "	11½ "	30.00	33.00

The Standard Camera. REVERSIBLE BACK.



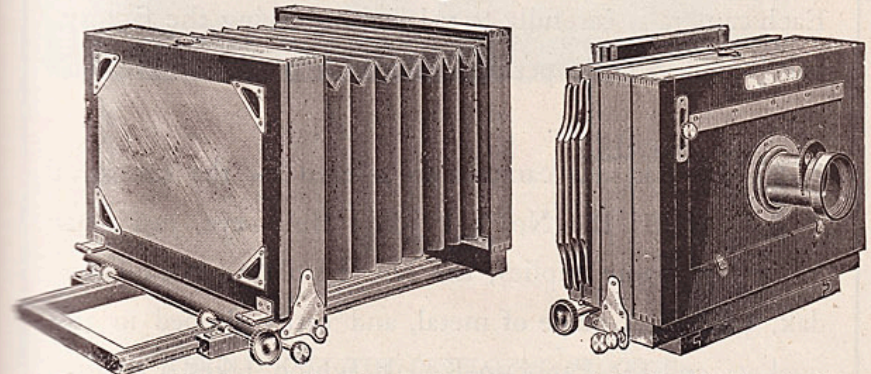
The **STANDARD CAMERA** is made on the same general style as the Empire State, with back focus and without rack and pinion.

The price includes canvas carrying case and one Perfection Holder, but no lens or tripod.

The carrying case will hold two extra plate holders.

Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.	Double Swing.
3½ x 4½ in.	9½ in.	1½ lbs.	\$10.00	\$12.00
4 x 5 "	10½ "	2 "	10.00	12.00
4½ x 6½ "	12 "	2½ "	12.00	14.00
5 x 7 "	13 "	3 "	12.00	14.00
5 x 8 "	13½ "	3½ "	14.00	16.00
6½ x 8½ "	14½ "	4½ "	16.00	18.00
8 x 10 "	16½ "	5½ "	18.00	20.00

New Model Improved Camera.



The **New Model Improved** is made after the general style of the New Model, and makes a very desirable instrument for those who want a good camera but do not care to invest in a high priced outfit.

Price includes single view lens, Carlton Sliding Tripod, carrying case, and one Perfection Plate Holder (except 8 x 10, where neither lens nor tripod is included).

The carrying case will hold two extra plate holders.

Size of View.	Focal Capacity.	Weight of Camera.	Single Swing.	Double Swing.
3½ x 4½ in.	8½ in.	1½ lbs.	\$13.00	\$15.00
4 x 5 "	9 "	1½ "	14.00	16.00
4½ x 6½ "	9½ "	2½ "	16.00	18.00
5 x 7 "	11½ "	2½ "	18.00	20.00
5 x 8 "	12½ "	2½ "	18.00	20.00
6½ x 8½ "	14 "	3½ "	22.00	24.00
8 x 10 "	16 "	5½ "	15.00	17.00

KODAKS.

THESE popular cameras have a feature which recommends itself strongly to the tourist and bicycle rider. This is the daylight loading arrangement of light-proof film cartridges, which may be put in or unloaded in broad daylight. From the small pocket Kodak to the more elaborate cartridge Kodak, the same standard of excellence is maintained in manufacture. Each camera is carefully tested before leaving the factory, and is warranted in perfect condition.

THREE new cameras are offered for the season of 1899: the No. 2 Folding Bull's-eye, just what its name implies; the No. 2 Folding Pocket Kodak, $3\frac{1}{2} \times 3\frac{1}{2}$, made of metal, and easily slipped in the pocket; and the Panoram Kodak, which takes a picture embracing an angle of about 150° for panoramic pictures.

Lloyd's Ideal *Aluminum Holders*

.. FOR DEVELOPING FILMS ..



Film Development BECOMES A
... PLEASURE

IF YOU USE

Lloyd's Ideal Film Holders

THROUGHOUT THE DEVELOPING PROCESSES.
THEY KEEP THE FINGERS OFF THE FILMS.

No curling in the bath

No soaking before development

No more uneven development

No loss of patience

HANDLED AS EASILY AS PLATES

Made of lacquered aluminum, and consequently not corroded by the developing fluids. Several films may be developed at once.

(DIRECTIONS AND PRICES OVER.)

Lloyd's Ideal Film Holders



Cut up the entire roll of film while the fingers are dry, and slip each piece, face up, into a holder. Then treat each as if it were a plate, keeping the film in the holder during developing, fixing, washing, and drying. As soon as the film holders are immersed in the developer, run the corner of a piece of thin paper under the clips, to prevent the formation of air bells. Use sufficient developer to cover the films thoroughly. Dry the negatives in a vertical position. If the openings in the holders show in the negative after development, it will be found that the dark-room light is unsafe, and has slightly fogged the parts of the negative over the openings. This can best be overcome by improving the quality of the dark-room light.

- Prices -

Set of six, for Pocket Kodaks,	1 1/2 x 2 pictures,	\$0.50
" " " " Baby Hawkeyes,	2 x 2 1/2 "	.50
" " twelve, for Folding Pocket Kodaks,	2 1/4 x 3 1/4 "	1.00
" " " for films 3 1/2 inches wide,	3 1/2 x 4 1/2 "	1.00
" " " " 3 1/2 " " *	3 1/4 x 3 1/4 "	1.00
" " " " 3 1/2 " " †	3 1/2 x 3 1/2 "	1.00
" " " " 4 " " ‡	4 x 5 "	1.00
" " " " 4 1/2 " " §	4 1/2 x 3 1/2 "	1.00
" " " " 5 " " ¶	5 x 4 "	1.00
" " " " 5 " " ||	5 x 8 "	1.35
" " " " 7 " " ¶¶	7 x 5 "	1.35
Each, for Panoram Kodak,	4 x 12 "	.90

*No. 2 Bull's-eyes, Bullets, both regular and special, No. 2 Folding Bull's-eyes, No. 2 Folding Pocket Kodaks, No. 2 Falcons, Tourist Hawkeyes.

† Hawkeye, Jrs., 3 1/2 x 3 1/2.

‡ No. 4 Bullets and Bull's-eyes, No. 4 Bull's-eye Special, No. 4 Horizontal Cartridge Roll Holders.

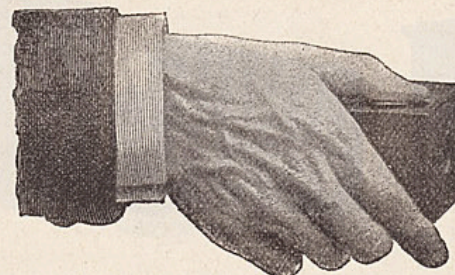
§ No. 4 Cartridge Kodaks, No. 4 Vertical Cartridge Roll Holders, for Rays, Pocos, Premos, etc.

¶ Takes two No. 4 Cartridge Kodak films.

¶¶ No. 5 Cartridge Kodaks and all 5 x 7 Cartridge Roll Holders.

In ordering specify length of spool on which film is rolled; also, give name of camera.

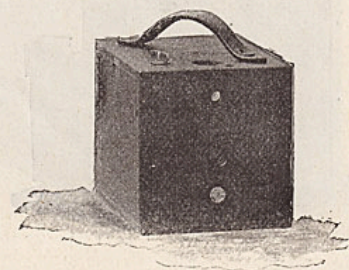
The Pocket Kodak.



Measures 2 1/4 x 2 3/4 x 3 3/4 inches, makes a picture 1 1/2 x 2 inches, and weighs only 6 ounces.

Pocket Kodak covered with fine leather, with roll of film for 12 exposures,	\$5.00
Leather hand carrying case (for Pocket Kodak and three extra spools of film). Price of case only,	.75
Leather bicycle carrying case (for Pocket Kodak and three extra spools of film). Price of case only,	1.00
Russet leather cases,	1.00
Film cartridge, 12 exposures,	.25
Complete A B C developing and printing outfit,	1.50
Plate holders,	.25

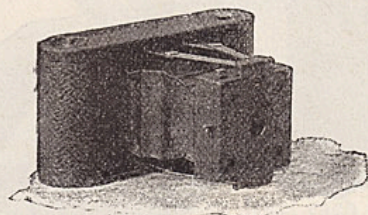
No. 2 Falcon Kodak.



For square pictures 3 1/2 x 3 1/2 inches; capacity, 12 exposures without reloading; size of camera, 4 1/2 x 4 1/2 x 5 3/4 inches (= 116 cubic inches); weight, 19 ounces; length of focus of lens, 4 1/2 inches.

No. 2 Falcon Kodak, not loaded,	\$5.00
Light-proof film cartridge, 12 exposures, 3 1/2 x 3 1/2,	.60
Black sole leather carrying case,	1.25
Complete Bull's-eye developing and printing outfit,	1.00

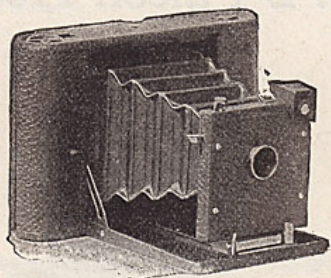
The No. 1 Folding Pocket Kodak.



Oblong, with rounded ends. Is but one and one-half inches thick when closed, and can be easily carried in the pocket. Has new self-setting shutter, and is made of aluminum, thus combining strength with lightness. Loads in daylight.

Folding Pocket Kodak, with achromatic lens, not loaded,	\$10.00
Light proof film cartridge, 12 exposures, $2\frac{1}{2} \times 3\frac{1}{4}$, . . . . .	.40
Black sole leather carrying case and strap,	1.25
Complete A B C developing and printing outfit,	1.50

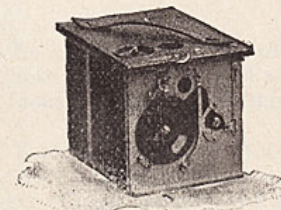
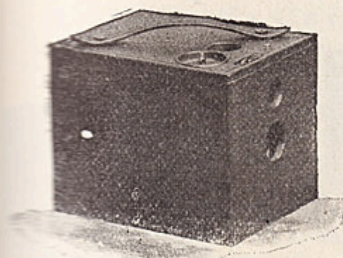
The No. 2 Folding Pocket Kodak.



For square pictures, $3\frac{1}{2} \times 3\frac{1}{2}$ inches; capacity, 12 exposures without reloading; size of Kodak, $1\frac{1}{2} \times 4\frac{1}{2} \times 6\frac{3}{4}$ inches; weight, $16\frac{1}{2}$ ounces; length of focus of lens, $4\frac{1}{2}$ inches. Has rounded ends, is made of aluminum, leather covered, and has the improved Folding Pocket Kodak shutter.

No. 2 Folding Pocket Kodak, with achromatic lens, not loaded,	\$15.00
Light proof film cartridges, 12 exposures, $3\frac{1}{2} \times 3\frac{1}{4}$, . . . . .	.60
Black sole leather carrying case,	1.25
Complete Bull's-eye developing and printing outfit,	1.00

Improved No. 2 Bull's-eye.

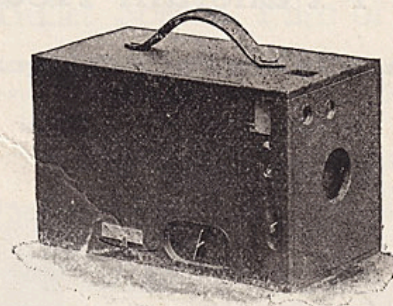


SHOWING BULL'S EYE SHUTTER.

For square pictures, $3\frac{1}{2} \times 3\frac{1}{2}$ inches; capacity, eighteen exposures without reloading; size of camera, $4\frac{1}{2} \times 4\frac{1}{2} \times 5\frac{3}{4}$ inches = 116 cubic inches; weight, 18 ounces; length of focus of lens, $4\frac{1}{2}$ inches.

No. 2 Bull's-eye, fitted with achromatic lens (not loaded),	\$8.00
Light-proof film cartridge, twelve exposures, $3\frac{1}{2} \times 3\frac{1}{4}$, . . . . .	.60
Light-proof film cartridge, eighteen exposures, $3\frac{1}{2} \times 3\frac{1}{4}$, . . . . .	.90
Black sole leather carrying case,	1.25
Complete A B C developing and printing outfit,	1.50

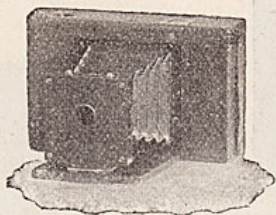
Improved No. 4 Bull's-eye.



For rectangular pictures, 4 x 5 inches; capacity, twelve exposures without reloading; size of camera, $4\frac{1}{2} \times 5\frac{3}{4} \times 9\frac{1}{4}$ inches = 265 cubic inches; weight, 2 pounds, 2 ounces; length of focus of lens, $6\frac{1}{4}$ inches.

No. 4 Bull's-eye, fitted with achromatic lens (not loaded),	\$12.00
Light-proof film cartridge, twelve exposures, 4 x 5, . . . . .	.90
Black sole leather carrying case,	2.00
Complete A B C developing and printing outfit,	1.50

No. 2 Folding Bull's-eye.



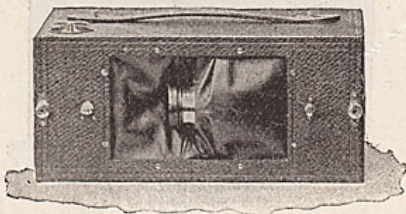
For square pictures, $3\frac{1}{2} \times 3\frac{1}{2}$ inches; capacity, 12 exposures without reloading; size of camera, $1\frac{3}{4} \times 4\frac{5}{8} \times 7\frac{1}{8}$ inches; weight, 14 ounces; length of focus of lens, 5 inches.

No. 2 Folding Bull's-eye, fitted with achromatic lens (not loaded),	\$10.00
Light-proof film cartridges, 12 exposures, $3\frac{1}{2} \times 3\frac{1}{2}$, . . . . .	.60
Black sole leather carrying case,	1.25
Complete Bull's-eye developing and printing outfit,	1.00



No. 4 Panoram Kodak.

Uses No. 4 Bull's-eye Film Cartridges.



For pictures $3\frac{1}{2} \times 12$ inches; size of camera, $4\frac{1}{2} \times 5\frac{1}{2} \times 10\frac{1}{4}$ inches; weight, 2 lbs. 6 ounces; length of focus of lens, 5 inches.

Has a scope of view of 142° , and lens working at about *f.* 10. Carries two extra films in back. Shutter works practically in the focal plane, which allows of extreme speed.

No. 4 Panoram Kodak, rapid rectilinear lens, not loaded,	\$20.00
Light-proof cartridges, 5 exposures, $3\frac{1}{2} \times 12$ (regular No. 4 Bull's-eye cartridges), . . . . .	.90
Black sole leather carrying case,	2.00

No. 2 Bull's-eye Special.

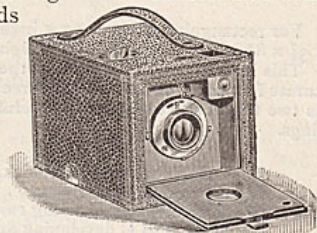
For square pictures, $3\frac{1}{2} \times 3\frac{1}{2}$ inches; capacity, 12 exposures without reloading; size of camera, $4\frac{3}{4} \times 4\frac{3}{4} \times 6\frac{3}{4}$ inches; weight, 22 ounces; length of focus of lens, 5 inches.



This instrument combines the extreme simplicity of the cartridge system, as exemplified in the No. 2 Bull's-eye, with a shutter and fixed focus double lens of the finest quality.

The shutter is, in fact, the Eastman pneumatic shutter which is furnished with the No. 4 Cartridge Kodak, but arranged to work with a finger release instead of with a bulb. It has three speeds for instantaneous exposures and is fitted with iris diaphragm stops graduated for *f.* 8, 16, 32, and 64. The shutter is set and operated without opening the front except to change speeds or change action from time to instantaneous *vice versa*.

This Kodak has square finder, socket for tripod screw, is covered with fine black morocco and beautifully finished.

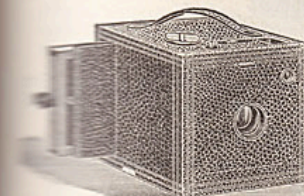


No. 2 Bull's-eye Special, showing shutter.

No. 2 Bull's-eye Special, with rapid rectilinear lens and Eastman shutter, with iris diaphragm stops, not loaded,	\$15.00
Light-proof film cartridge, 12 exposures, $3\frac{1}{2} \times 3\frac{1}{2}$, . . . . .	.60
Light-proof film cartridge, 18 exposures, $3\frac{1}{2} \times 3\frac{1}{2}$, . . . . .	.90
Black sole leather carrying case,	1.25
Complete Bull's-eye developing and printing outfit,	1.00

No. 2 Bullet Special, Film or Plates.

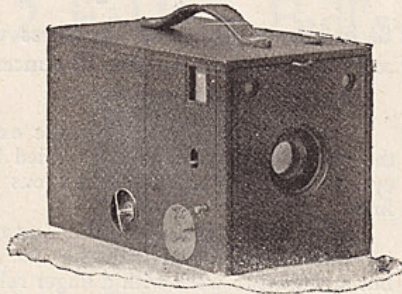
For square pictures, $3\frac{1}{2} \times 3\frac{1}{2}$ inches; capacity, 12 exposures without reloading; size of camera, $4\frac{3}{4} \times 4\frac{3}{4} \times 7\frac{1}{2}$ inches; weight, 35 ounces; length of focus of lens, 5 inches.



The Bullet Special bears the same relation to the Bull's-eye Special as the regular Bullets do to the Bull's-eyes. It is fitted with a double rapid rectilinear lens of fixed focus, and the regular Cartridge Kodak shutter. It loads in daylight, taking the ordinary $3\frac{1}{2}$ -inch spool, and may be easily adapted to plates. Unlike the original No. 2 Bullet, it takes *double* holders in place of the regulation single holders. Has square finder and socket for tripod screw.

No. 2 Bullet Special Kodak, lens, Eastman shutter, not loaded,	\$18.00	Ladies' buff leather hand carrying case, with name plate,	\$2.00
Light-proof cartridge, 12 exposures, . . . . .	.60	Double glass plate holders, $3\frac{1}{2} \times 3\frac{1}{2}$, for No. 2 Bullet Special,	1.00
Black sole leather case,	1.25	Leather case for three double plate holders, . . . . .	.75
Carrying case, style A,	2.00	Leather cases for six double plate holders,	1.00
Washers for holding case in front of lens rod, per set, . . . . .	.50	Complete Bull's-eye developing and printing outfit,	1.00
Removable lamp bracket, . . . . .	.25		
Carrying case, style B,	1.50		

No. 4 Bull's-eye Special.



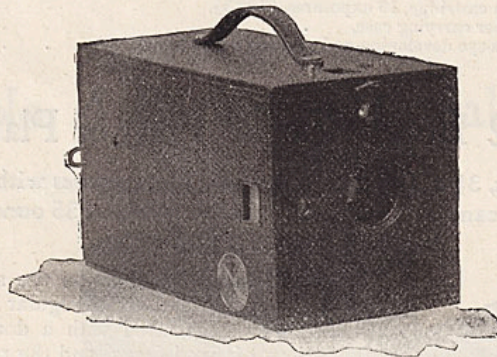
For rectangular pictures 4 x 5 inches; capacity, 12 exposures without reloading; size of camera, $5 \times 5\frac{1}{2} \times 8\frac{1}{2}$ inches = 257 cubic inches; weight, 2 pounds 9 ounces; length of focus of lens, $6\frac{1}{2}$ inches.

This instrument is fitted with the regular Eastman Cartridge Kodak lens and shutter, with accurate focussing scale. It has three speeds for instantaneous exposures, time and bulb releases. Has two tripod screws and two carefully corrected finders. Covered with fine morocco, nickel-plated fittings.

PRICE.

No. 4 Bull's-eye Special Kodak, Eastman lens and shutter (not loaded),	\$20.00
Light proof film cartridge,	.90
Black sole leather carrying case,	2.00
Complete A B C developing and printing outfit,	1.50

No. 4 Bullet Special.



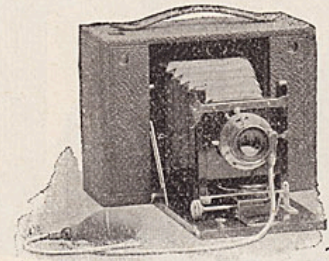
For rectangular pictures 4 x 5; capacity, 12 exposures without reloading; size of camera, $5\frac{1}{2} \times 6\frac{1}{4} \times 10\frac{3}{8}$ inches = 373 cubic inches; weight, including roll holder, 3 pounds 9 ounces; length of focus of lens, $6\frac{1}{2}$ inches.

No. 4 Bullet Special differs from the other Bull's-eyes and Bullets in that it is fitted with a 4 x 5 cartridge roll holder, with dark slide, thus making it possible to focus while using film, and to use interchangeably either films or plates.

PRICE.

No. 4 Bullet Special Kodak, for film or plates, including cartridge roll holder, one double plate holder, and Eastman lens and shutter, not loaded,	\$25.00
Same without roll holder,	20.00
Cartridge roll holder, not loaded,	5.00
Light proof film cartridge,	.90
Double plate holders, 4 x 5,	1.00
Black sole leather carrying case,	2.25
Complete A B C developing and printing outfit,	1.50

The No. 4 Cartridge Kodak.



CARTRIDGE KODAK, OPEN.

For Film and Plates.

For rectangular pictures, 4 x 5 inches; capacity, 12 exposures without reloading; size of camera, $3\frac{1}{2} \times 6\frac{1}{2} \times 8\frac{1}{2}$ inches = 167 cubic inches; weight, loaded, 2 pounds, 12 ounces; length of focus of lens, $6\frac{1}{2}$ inches.

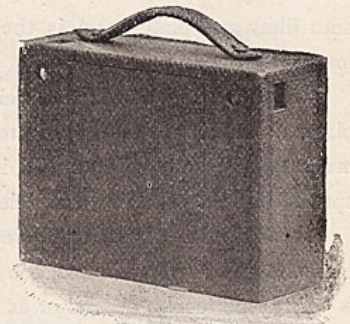
In the Cartridge Kodak the makers have adapted the "Film Cartridge System" to a folding Kodak of the finest quality and greatest capabilities. It is hardly more than half the thickness of other cameras which are adapted to both film and plates, and is the only folding camera having the daylight loading feature. The makers never place a camera upon the market until they have thoroughly tested its actual working qualities under all conditions, and the finished product is always an improvement over the first model; but in their years of experience in camera making no instrument which they have introduced has been so carefully planned, so severely tested, or has been the subject of so much thought and experiment as the Cartridge Kodak. The result is an instrument which is the embodiment of photographic perfection.

The Cartridge Kodak uses either daylight loading film cartridges or glass plates, is fitted with carefully tested rapid rectilinear lenses and pneumatic release shutter fitted with Iris Diaphragm stops. This shutter has three speeds for instantaneous exposures. It makes short time exposures by one pressure of the bulb, the shutter closing when the bulb is released, and makes longer time exposures by pressing the bulb once to open the shutter and again to close it. It may be operated by the finger trigger instead of the bulb when so desired.

The Cartridge Kodak is provided with a rising, sliding and falling front, two view finders, one for vertical and one for horizontal exposures, two sockets for tripod screws, and is equally perfect as a hand or as a tripod camera. It has an index for focusing, and when used with plates may be focused on the ground glass if desired.

When used with film there are no projecting parts, no attachments to become lost, no extras to be mislaid.

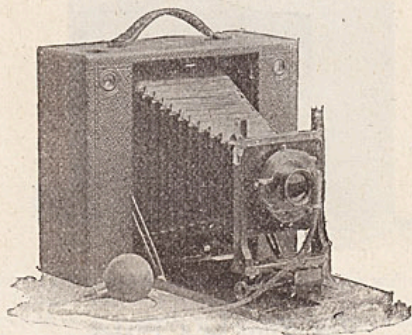
The plate adapter is simple and compact, and can be put in place or removed in five seconds. Strength and reliability have not been sacrificed to mere lightness, nor efficiency to compactness. The finish is rich and beautiful. When closed for carrying it is inconspicuous, there being no metal parts in sight, even the key, which is in the bottom of the camera, being recessed and entirely hidden from view. When open for use it exposes to view a bed and front board of highly polished mahogany with buffed brass fittings, set off in brilliant contrast by the highly polished nickel shutter. In short, it has, in a superlative degree, that rich and dainty finish which characterizes all these goods.



CARTRIDGE KODAK, CLOSED.

No. 4 Cartridge Kodak, with rapid rectilinear lens and pneumatic shutter,	\$25.00
Light-proof film cartridge, 12 exposures, 5 x 4 inches,	.90
Plate adapter, with focussing glass,	2.50
Plate holders,	1.00
Sole leather case,	2.00

The No. 5 Cartridge Kodak.



For Film and Plates.

For rectangular pictures, 5 x 7; capacity, 12 exposures without reloading; size of camera, $3\frac{1}{4} \times 8\frac{1}{2} \times 10\frac{1}{2}$ inches || 280 cubic inches; weight, 3 pounds, 15 ounces; length of focus of lens, $8\frac{1}{2}$ inches.

Except in size, the 5 x 7 Cartridge Kodak differs but little from the 4 x 5. It is hardly more than half the thickness of other cameras which are adapted to both films and plates, and is the only 5 x 7 folding camera having the daylight loading feature.

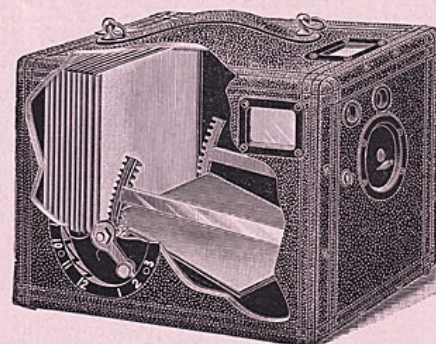
The Cartridge Kodak uses either our daylight loading film cartridges or glass plates, is fitted with carefully tested rapid rectilinear lens and the Eastman pneumatic release shutter fitted with iris diaphragm stops. Gives three instantaneous speeds, besides bulb and time release. Finger release is also furnished.

This camera has rising, sliding, and falling front, Eastman's patent non-collapsible bellows, two view finders, one for vertical and one for horizontal exposures, and is equally perfect as a hand or as a tripod camera. It has index for focussing, and when used for plates may be focussed on the ground glass, if desired.

The No. 5 Cartridge Kodak may easily be adapted to the wheel, either on the bicycle head or between the frame.

PRICE LIST.

No. 5 Cartridge Kodak, not loaded,	\$35.00
Film cartridge, 12 exposures, 5 x 7,	1.60
Black sole leather carrying case,	2.50
Bicycle case for No. 5 Cartridge Kodak,	3.25
Washer, to hold case in front of brake rod, per set, . . . . .	.50
Adjustable lamp bracket, . . . . .	.25
Glass plate adapter, with ground glass,	3.00
Double plate holders, 5 x 7, each,	1.25
Black sole leather carrying case, for 3 plate holders,	1.50
Eastman's special 5 x 7 developing outfit,	2.00



THE ADLAKE REPEATER

is a particularly appropriate name for our new magazine camera. In plan and action it is somewhat similar to the repeating rifle. It holds a dozen plates, which may be exposed in rapid succession by a slight turn of a lever, which removes the exposed plate and allows a fresh plate to move forward, ready for exposure.

The Exposure-Counting Device indicates the number of exposures made, and its locking arrangement makes it impossible to release more than one plate at a time. This is a valuable feature, because in other magazine cameras, unless you are exceedingly careful, you are likely to release more than one plate. As we have applied for a patent on the device, this feature cannot be copied without infringement.

Our Patent Catch (used on all Adlake cameras) prevents the box from being opened accidentally. Many plates may be spoiled on account of a poor, cheap catch. The importance of this feature should not be overlooked. The exposed plates are securely locked, and cannot be removed except at the pleasure of the operator. You can throw the camera about as much as you choose, but the plates cannot be dislodged by accident. To obtain satisfactory pictures, it is necessary to keep the lens clean. In nearly all popular priced cameras the lens cannot be taken out, and, consequently, cannot be cleaned properly. The lenses in all *Adlake Cameras* may be removed quickly and easily.

The Repeater Is Always Ready for Action, is extremely simple in construction and positive and rapid in operation. It is possible with the *Adlake Repeater* to take *twelve* pictures in *ten seconds*. No one but the veriest novice, however, will attempt to take a dozen pictures (?) in one second, or in one hundred seconds with any camera. Such waste is profitable to the plate-maker, but expensive to the amateur; it is not photography.

No loose springs; nothing to lose or mislay.

SPECIFICATIONS

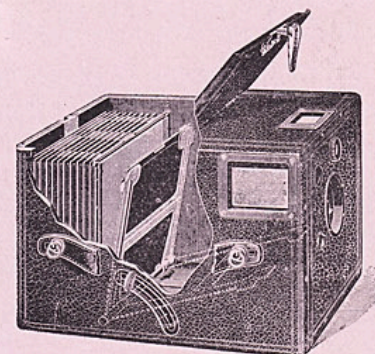
The box is made of tough, light wood, covered with black seal grain leather. There are two finders. The lens is the same as used in the *Adlake Regular*. There are four stops, numbered according to the F system.

Adlake Shutters (used on all Adlake cameras) are mounted on metal, and are not affected by warping, shrinking, or swelling of the wood. The metal sheaths which hold the plates are made of thin, black metal, and numbered from one to twelve, for convenience in recording exposures. All openings are protected by blackened metal trimmings. The indicator and exposing device is also blackened. The cameras have the standard tripod screw sockets.

Adlake Portrait Attachment for taking cabinet pictures and Adlake Panoramic Device free with each camera. The Adlake Multiplex Attachment for taking two or four pictures of same object in different positions on one plate may be used on both sizes.

PRICES

Adlake Repeater, 3¼ x 4¼-inch	\$5 50
Adlake Repeater, 4 x 5-inch	8 00
Adlake Multiplex Attachment	1 00



THE ADLAKE REGULAR

...AND...

ADLAKE SPECIAL CAMERAS

are unquestionably the best for amateurs. The twelve light-proof plate-holders accompanying each camera allow the use of two or more kinds of plates, at the pleasure of the operator. When loaded, the holders may be adjusted in, and taken out of the camera in broad daylight. If you want to remove one or more exposed plates from the camera you need only open the hinged cover and lift out the holder or holders wanted, leaving the unexposed plates undisturbed. No other fixed-focus camera is so convenient, safe and economical in use; no other camera will show so high a proportion of good pictures, and, everything considered, no other camera is so satisfactory as the *Adlake*.

SPECIFICATIONS

The box is made of tough, light wood, covered with black seal grain-leather. The two finders are unusually large, and the finder-boxes in the 4 x 5 are made of metal. The lens is the best achromatic single meniscus the Bausch & Lomb Optical Company can make; no such lens in any other fixed-focus camera. The lens can be easily and quickly removed for cleaning. There are four stops, numbered according to the F system.

The Adlake Shutter (used on all Adlake cameras) is mounted on metal. It cannot be affected by any possible shrinking, warping or swelling of the shutter-board. This shutter is of a high order of plan and work, will wear forever, and cannot get out of order.

Adlake Plate-Holders are very compact. They are light, thin steel or aluminum portfolios, formed at the edges to shut out light, and blackened, and open and close like a watch-case. The plate-holders are numbered from one to twelve, for convenience in keeping a record of exposures. There are no other plate-holders so good—no exception—whatever the cost of the camera. Blackened metal trimmings protect all openings on the 4 x 5-inch cameras. On the 3¼ x 4¼-inch everything is protected except the lever-groove.

Adlake Portrait Attachment for taking cabinet pictures and Adlake Panoramic Device free with each camera. The Adlake Multiplex Attachment for taking two or four pictures of same object in different positions on one plate may be used on both sizes.

The cameras have the *standard tripod screw sockets*. Adlake patented cover-catch on all *Adlake* cameras.

PRICES

Adlake Regular, 3¼ x 4¼-inch (with 12 steel plate-holders)	\$ 6 50
Adlake Regular, 4 x 5-inch (with 12 steel plate-holders)	10 00
Adlake Special, 4 x 5-inch (with 12 <i>aluminum</i> plate-holders)*	12 00
Adlake Multiplex Attachment	1 00

We cannot furnish the 3¼ x 4¼-inch with aluminum plate-holders.

*The only difference between the 4 x 5 Regular and Special cameras is in the plate-holders; otherwise they are alike.

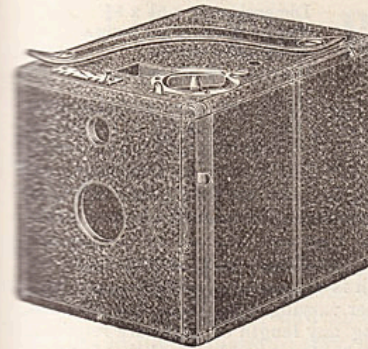
ANDREW J. LLOYD & CO.

323 and 325 Washington St.

BOSTON.

Dept. 5. Photographic Supplies. Lenses, Etc.

The Hawk-eye, Jr., 3½ x 3½.



A camera so constructed that either roll film or glass plates can be used interchangeably, without any attachment other than a plate holder.

The lens is a single achromatic, set focus, very rapid, and capable of doing good work indoors as well as in the open air. The latest improvement for a shutter allows time exposures to be made without danger of jarring the camera, which is a difficulty experienced when undertaking to make such exposures with a majority of small cameras.

When making snap shots the speed can be regulated, which will properly time the negative, even though the light be very weak. The device

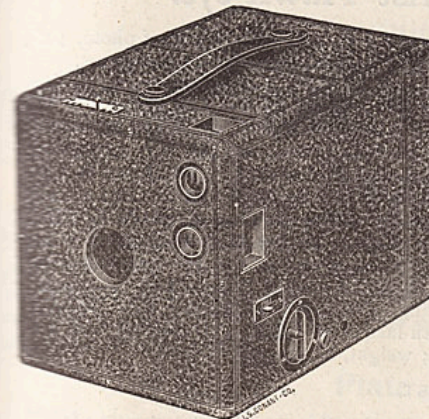
for indicating exposures never fails, and the automatic tally always shows at a glance the number of pictures taken. An extra brilliant square finder reflects the object very distinctly, and centres the view accurately upon the surface of the film or plate.

The covering of the box is of the best grain leather, and everything pertaining to the camera is simple and easy to operate.

PRICE LIST.

The Hawk-eye, Jr., covered with black grain leather,	\$8.00
Double holder, for dry plates, . . . . .	.75
Leather case, with strap,	1.50
Developing outfit,	1.00
Printing outfit,	1.00
Sunlight film, 12 exposures, . . . . .	.60

The 4 x 5 Hawk-eye, Jr.



The design of this camera is similar to that of the smaller Hawk-eye, Jr., although different in some respects. The lens is of the same quality as that we have used in the regular Hawk-eye for a number of years, and is arranged with a focussing lever and scale. Both vertical and horizontal finders, interior ground-glass screen, automatic registering tally showing number of exposures made, and a tripod plate for time work are provided.

This camera, like the smaller sizes, uses the Sunlight film, and can be loaded and unloaded in broad daylight without the least danger of destroying the material.

The advantage of using either film or glass plates must be considered, as it is often the case that one or two exposures are required for immediate development, and by

using the holder with plates the expense of an entire roll of film is saved.

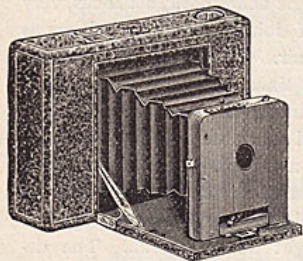
PRICE LIST.

The 4 x 5 Hawk-eye, Jr., covered with black grain leather,	\$15.00	Developing outfit,	\$1.25
Double holder, for dry plates,	1.00	Printing outfit,	1.25
Leather case, with strap,	2.50	Sunlight film, 12 exposures, . . . . .	.85

The Tourist Hawk-eye.

3 1-2 x 3 1-2

Dimensions, 1 1/2 x 4 1/2 x 6 1/2.
Size of photo, 3 1/4 x 3 1/2 inches.
Weight, 15 ounces.
Capacity, 12 exposures.



4 x 5

Dimensions, 2 x 5 1/2 x 8 1/2.
Size of photo, 4 x 5 inches.
Weight, 20 ounces.
Capacity, 12 exposures.

In constructing this Hawk-eye, the manufacturers have aimed to produce a camera making a picture of good size, and still of dimensions that will permit carrying in the pocket. The lens used is an achromatic, set focus, and guaranteed to cover the field under any conditions. The shutter is a simple, reliable piece of mechanism, so constructed that any amount of jarring will not affect its working qualities; can be regulated for different speed, which is the means of obtaining properly timed negatives under varying conditions, and also has a time device allowing any length of exposure required. A set of three stops is also provided, and the finder is

extra brilliant, showing the object very plainly.

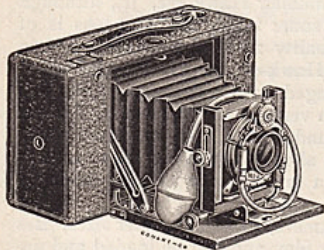
The new device for measuring film makes it impossible for mistakes to occur, and the registering tally always shows the exact number of exposures made.

The covering is of the finest morocco grain leather, and the workmanship throughout is of the very best.

We recommend this camera for the cyclist, as it can be carried safely on the frame, the same as an ordinary tool bag. It will also be found a convenient outfit for the traveller, as it loads in daylight, is very compact, and never gets out of adjustment.

	PRICE LIST.	3 1-2 x 3 1-2	4 x 5
The Tourist Hawk-eye, not loaded,		\$9.00	\$15.00
Special Sunlight film, 12 exposures,		.60	.85
Leather carrying case,		1.50	2.00
Developing outfit,		1.00	1.25
Printing outfit,		1.00	1.25
Plate attachment,			2.50
Extra dry plate holders,			1.00

The Special Tourist Hawk-eye.



Dimensions, 3 x 5 1/2 x 8 1/2 inches; size of photo, 4 x 5 inches; weight, 2 1/2 pounds; capacity, 12 exposures.

This camera is daylight loading with cartridge film, 4 x 5, and is easily adapted for use with plates. It has removable front board, to which is attached a high-grade double rapid rectilinear lens, suitable for all general work, and the latest Umicum shutter, which works automatically from one to one-hundredth part of one second. Iris diaphragm, time and bulb exposures, are also included. There are two tripods, one for horizontal and one for vertical exposures, rack and pinion for fine focussing,

rising and falling front, and both horizontal and vertical finders. The back of the camera is removable, and may be replaced with extra fitting by a plate back, for use with dry plate holders. Wood parts of mahogany, finished with lacquered brass, and covered with fine grain morocco. Dimensions, 3 x 5 1/2 x 8 1/2 inches; weight, 2 1/2 pounds.

PRICE LIST.

The Special Tourist Hawk-eye,	\$25.00
The Special Tourist Hawk-eye, no lens,	15.00
Special Sunlight film, 12 exposures, 4 x 5,	.85
Leather carrying case, with strap,	2.00
Plate attachment, with one double holder,	2.50
Extra holders, for dry plates,	1.00
Developing outfit,	1.25
Printing outfit,	1.25

The Ray Cameras.

The success of the 1898 Rays has encouraged the manufacturers to put out new designs and sizes, which have met with instant success. On the newer models we supply, without extra charge, the new Ray Multiplying Attachment, by which one may take two positions of the same subject upon the same plate. In this way many a weird effect, such as a man fighting a duel with himself, etc., may be easily produced.

These cameras are made by practical camera manufacturers, who have all their work under their direct supervision, and are prepared to give you cameras that are practical and up-to-date; and we can thoroughly guarantee all we claim for them. They are in the business to stay, and want their goods to advertise themselves and secure public confidence in them.

These cameras are light, small, and neat in appearance. They are covered with genuine leather and trimmed with polished and lacquered brass.

Lenses.

Only the most improved type of meniscus achromatic lenses are used in the construction of these cameras. They are accurately corrected, and cover the plate clearly to the corners, even in the 4 x 5 size.

Finder.

The finder is square, with the lens properly adjusted to throw the image in the centre of the ground glass; and the view in the finder is just a little less than that on the plate, preventing the failure, so often made, of cutting off parts of the picture you wish to get. This will be appreciated by those who have already used cameras.

Shutters.

The RAY SHUTTERS are marvels of simplicity. They are set by turning a milled head on the front of the camera; and the release is controlled by one lever, a downward pressure making a snap-shot, and two upward ones a time exposure.

Diaphragms.

In all designs but the Junior a revolving diaphragm with three openings is used. As is well known, the smaller the stop or diaphragm, the sharper is the picture, or, what is the same thing, objects at different distances from the camera are in focus at the same time. We have arranged for this in a simple and practical manner, which is fully described and explained in the instruction books which accompany each camera.

Plate Holder.

The new patent plate holders are one-fifth of an inch thick, the smallest, lightest, and most durable ever placed on the market. They each hold one plate with a separate rubber slide to each, thus preventing the failures continually made in magazine cameras, in which, if light reaches one plate, it injures the whole lot, causing great expense and annoyance. Owing to improved methods of manufacturing, they are able to furnish these plate holders at more reasonable prices than anything hitherto offered. Cut sheet films can also be used in these holders without any extra appliances.

Manipulation.

The manipulation of these cameras is the simplest of any, and can be learned at a glance, requiring very little instruction. The patent shutter has no complicated parts to get out of order, and is operated by a button to set it and one lever for either time or instantaneous exposures, which can be made at will by pressing the lever down for instantaneous and up for time. This has never before been accomplished in a photographic shutter.

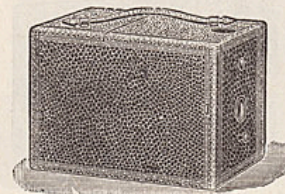
All catches, hinges, and similar parts are securely fastened, and guaranteed not to fall off or come loose.

Multiplying Attachment.



The latest photographic novelty. By means of this device it is possible to take two positions of the same subject on the same plate. With a little ingenuity, many interesting and ludicrous pictures may be taken. For instance, the same person seated at both sides of the same table, fighting a duel with himself, etc., together with hundreds of other possibilities. The best pictures are those in which the action of the one double is directed on the other position, for example, where one of the subjects is "holding up" the other or in conversation with the other.

The Ray, Jr., 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$.



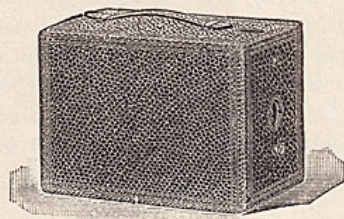
This camera was designed to meet the demand for something cheaper than the Ray, and still give a fair-sized picture with good results. The same care is taken in the selection of lenses and material as in the more expensive cameras. It has a single achromatic lens that covers the plate perfectly, has a round view finder, single diaphragm, and rotary shutter.

It is covered with seal grain leather, has leather handle, and a capacity of six plate holders, and measures but 5 $\frac{1}{2}$ x 3 $\frac{3}{8}$ x 3 $\frac{1}{2}$ inches, and weighs 7 ounces.

Price, including two plate holders,	\$2.50
Extra holders, . . . . .	.25
Ray, Jr., carrying case, for bicycle or shoulder,	1.00
Lloyd metal candle lamp, . . . . .	.25
Ruby lantern, No. 1, . . . . .	.80
Ruby lantern, No. 2,	1.00
Ray, Jr., printing frame, . . . . .	.25
Rayon toning solution, 8-oz. bottle, . . . . .	.35
Lloyd combined toning and fixing powders, per box of 6, . . . . .	.25
Ray, Jr., dry plates, 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$, per dozen, . . . . .	.20
Lloyd developing powders, per box of 6, . . . . .	.25
Lloyd, Jr., developing trays, 3 $\frac{1}{2}$ x 4 $\frac{1}{2}$, . . . . .	.20
Ray, Jr., card mounts, per package of 25, . . . . .	.20
Ray, Jr., card mounts, per package of 100, . . . . .	.60

Lloyd, Jr., Developing and Printing Outfit, \$1.00.

The Ray, $3\frac{1}{2} \times 3\frac{1}{2}$.



This is the most **complete** and **perfect** camera **ever offered** for the price. It makes a $3\frac{1}{2} \times 3\frac{1}{2}$ picture. Has a revolving diaphragm with three openings, brilliant square view finder (properly adjusted), Universal tripod socket, and a simple and practical Improved Patent Revolving Shutter.

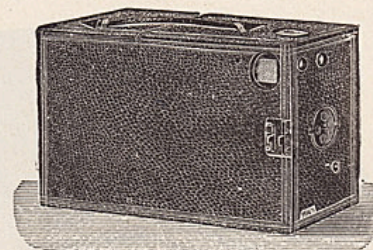
It is covered with genuine morocco grain leather, trimmed with polished and lacquered brass.

The Ray has a capacity of six plates, measures $6\frac{1}{2} \times 4\frac{3}{4} \times 4\frac{1}{2}$ inches, and weighs less than 14 ounces.

Price, Ray, including two holders,	\$4.00
Extra holders, Ray, . . . . .	.35
Ray carrying case, for bicycle or shoulder,	1.25
Tripods, No. 1, sliding,	2.00
Tripods, No. 1, combination,	2.50
Lloyd folding candle lamp, . . . . .	.40
Lloyd metal candle lamp, . . . . .	.25
Ruby lantern, No. 1, . . . . .	.80
Ruby lantern, No. 2,	1.00
Ray printing frame, . . . . .	.25
Rayon toning solution, 8-oz. bottle, . . . . .	.35
Lloyd combined toning and fixing powders, per box of 6, . . . . .	.25
Ray dry plates, $3\frac{1}{2} \times 3\frac{1}{2}$, per dozen, . . . . .	.35
Lloyd developing powders, per box of 6, . . . . .	.25
Lloyd developing trays, 4 x 5, . . . . .	.28
Ray card mounts, per package of 25, . . . . .	.25
Ray card mounts, per package of 100, . . . . .	.85

Lloyd, Jr., Developing and Printing Outfit, complete
\$1.00.

The Ray B Camera, $3\frac{1}{4} \times 4\frac{1}{4}$,



WITH NEW MULTIPLYING ATTACHMENT.

The wonderful success with which the Ray cameras have met has induced the manufacturers to put on the market new styles, which we now illustrate for the first time. These new cameras are made in the same careful manner as the Ray and Ray, Jr.; and the thousands now in use, giving almost universal satisfaction, are the best recommendation that we can offer.

These cameras are as complete and perfect as it is possible to make a camera for this price.

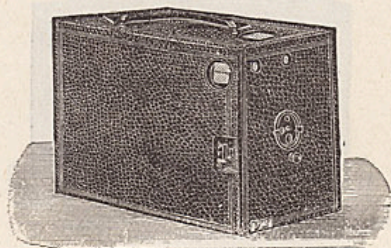
The Ray B camera makes $3\frac{1}{4} \times 4\frac{1}{4}$ pictures; has revolving diaphragm with three openings, brilliant square view finder (accurately adjusted), universal tripod sockets, and the popular, simple improved Ray Shutter. These cameras are covered with genuine morocco grain leather, and trimmed with polished and lacquered brass.

The "Ray B" has a capacity for **TWELVE PLATES**, measures $8\frac{1}{2} \times 5\frac{1}{4} \times 4\frac{3}{4}$ inches, and weighs 23 ounces.

Price, Ray B, including twelve holders,	\$8.00
Price, Ray B, including two holders,	5.00
Extra holders, . . . . .	.35
Ray B carrying case, for bicycle or shoulder,	1.50
Tripods, No. 1, sliding,	2.00
Tripods, No. 1, combination,	2.50
Lloyd metal candle lamp, . . . . .	.25
Lloyd folding candle lamp, . . . . .	.40
Ruby lantern, No. 1, . . . . .	.80
Ruby lantern, No. 2,	1.00
Ray printing frame, . . . . .	.25
Rayon toning solution, 8-oz. bottles, . . . . .	.35
Lloyd combined toning and fixing powders, per box of 6, . . . . .	.25
Ray dry plates, $3\frac{1}{4} \times 4\frac{1}{4}$, per dozen, . . . . .	.45
Lloyd developing powders, per box of 6, . . . . .	.25
Lloyd developing trays, 4 x 5, . . . . .	.28
Ray B card mounts, per package of 25, . . . . .	.28
Ray B card mounts, per package of 100,	1.00

Lloyd Developing and Printing Outfit, \$1.50.

The Ray C Camera, 4 x 5,



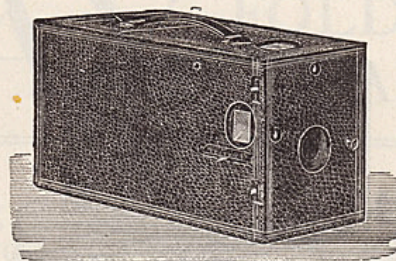
WITH NEW MULTIPLYING ATTACHMENT.

This camera is designed to meet the demand of those who wish to make a picture as large as possible with a fixed focus camera. It has a single achromatic lens with good covering capacity. A great deal of time has been spent perfecting this lens so that it will do the work in a proper manner. It has two square view finders (accurately adjusted), universal tripod sockets, and the popular, simple, improved Ray shutter. The Ray C has a capacity for three double wooden plate holders, 4 x 5, with rubber slides.

Price, including one double plate holder,	\$5.00
Extra holders, each,	1.00
Carrying case for bicycle or shoulder,	2.00
Tripods, No. 1, sliding,	2.00
Tripods, No. 1, combination,	2.50
Lloyd metal candle lamp, . . . . .	.25
Lloyd folding candle lamp, . . . . .	.40
Ruby lantern, No. 1, . . . . .	.80
Ruby lantern, No. 2,	1.00
Ray printing frame, . . . . .	.25
Rayon toning solution, 8-oz. bottles, . . . . .	.35
Lloyd combined toning and fixing powders, per box of 6, . . . . .	.25
Ray dry plates, per dozen, . . . . .	.65
Lloyd developing powders, per box of 6, . . . . .	.25
Lloyd developing trays, 4 x 5, . . . . .	.28
Ray C card mounts, per package of 25, . . . . .	.35
Ray C card mounts, per package of 100,	1.25

Lloyd Developing and Printing Outfit, \$1.50.

The Ray D Camera, 4 x 5.



This new camera has been added to the already large list of the well-known RAY cameras in order to meet the requirements of those wishing a good 4 x 5 focussing camera of the box pattern at a moderate price. It is especially fitted for those who are not suited by the compact folding cameras because of the necessary opening and shutting of those cameras before and after use.

The RAY D is handsomely covered with fine seal grain leather throughout, is fitted with a fine, high-grade achromatic lens of good covering capacity, has two large and brilliant rectangular view finders, two tripod sockets, a focussing scale accurately marked for views from six feet to any distance, and has a door at the back to admit of focussing on the ground glass when desired.

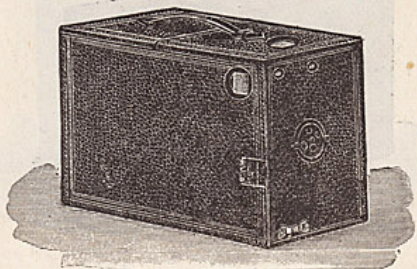
The shutter is of the NEW RAY pattern, the simplest and nearest to perfection of any ever placed on a hand camera. It does not expose the plate in setting, can be easily regulated for different speeds of the instantaneous, and is so arranged that one lever operates both time and instantaneous exposures.

The RAY D camera is made to hold four double plate holders or roll holder.

Price, complete, with one double holder,	\$8.00
Extra holders, each,	1.00
Carrying case for bicycle or shoulder,	2.00
Lloyd's single folding tripod,	1.00
Tripods, No. 1, sliding,	2.00
Tripods, No. 1, combination,	2.50
Lloyd metal candle lamp, . . . . .	.25
Lloyd folding candle lamp, . . . . .	.40
Ruby lantern, No. 1, . . . . .	.80
Ruby lantern, No. 2,	1.00
Ray printing frame, . . . . .	.25
Rayon toning solution, 8-oz. bottles, . . . . .	.35
Lloyd's combined toning and fixing powders, per box of 6, . . . . .	.25
Ray dry plates, 4 x 5, per dozen, . . . . .	.65
Lloyd's developing powders, per box of 6, . . . . .	.25
Lloyd's developing trays, 4 x 5, . . . . .	.28
Ray D card mounts, per package of 25, . . . . .	.35
Ray D card mounts, per package of 100,	1.25

Lloyd Developing and Printing Outfit, \$1.50.

The Ray E Camera, 4 x 5,



WITH NEW MULTIPLYING ATTACHMENT.

With the new thin metal plate holders the manufacturers of the Ray cameras have designed a 4 x 5 universal focus camera, having a capacity of twelve plates. It has single achromatic lens, fully covering the plate, two accurate view finders, universal tripod socket, and the popular Ray shutter. Every camera fitted with our simple duplicating device, by which many weird and curious effects may be produced.

Price, complete, with twelve single plate holders,	\$10.00
Extra holders,	.40
Carrying case for bicycle or shoulder,	2.00
Lloyd's single folding tripod,	1.00
Tripods, No. 1, sliding,	2.00
Tripods, No. 1, combination,	2.50
Lloyd metal candle lamp,	.25
Lloyd folding candle lamp,	.40
Ruby lantern, No. 1,	.80
Ruby lantern, No. 2,	1.00
Ray printing frame,	.25
Rayon toning solution, 8-oz. bottles,	.35
Lloyd's combined toning and fixing powders,	.25
Ray dry plates, 4 x 5,	.65
Lloyd's developing powders, per box of 6,	.25
Lloyd developing trays, 4 x 5,	.28
Ray E card mounts, per package of 25,	.35
Ray E card mounts, per package of 100,	1.25

Lloyd Developing and Printing Outfit, \$1.50.

RAY FOLDING CAMERAS.

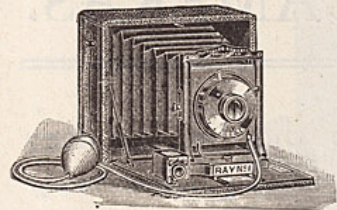
In calling your attention to the line of Ray Folding Cameras for 1899, we will endeavor to give description of each particular style in as clear and concise terms as possible, calling attention to the particular features and advantages which each particular style possesses over the preceding one.

By practical drawings and concise description we will try to make the difference in the various styles plainly apparent, and thus give the intending purchaser a definite idea of the advantages of any particular style.

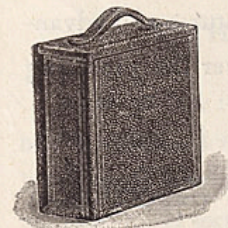
The cameras throughout are constructed of the best selected mahogany, thoroughly kiln-dried, and polished to the highest degree of perfection. The metal throughout is of selected material, made particularly for each individual part. Durability has not been sacrificed for light weight and size; but every part is carefully figured and tested to perform the particular function it is intended to perform, making a handsome, neat, and durable combination. As hitherto stated, every part of the work is under direct supervision. Every camera is tested before leaving the factory, and is guaranteed to accomplish all that is claimed for it. You are assured in every instance of honest value for your money.

RAY CAMERAS.

Series No. 1.



CAMERA WITH RAY SHUTTER.



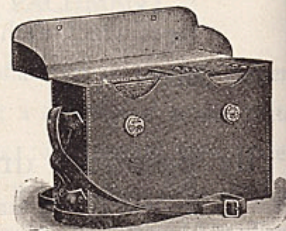
CAMERA CLOSED.

4 x 5 size, 2 1/4 x 5 1/4 x 6.
5 x 7 size, 2 3/8 x 6 1/4 x 8 1/4.
Weight, 4 x 5, 28 ounces.
" 5 x 7, 3 pounds.

Tourist or Cycle Folding Camera.

The unparalleled success we have met in the sale of this style camera during the past year, and the unsolicited testimonials we have received in regard to their merits, verify our statement when we say that for a simple, practical folding camera,

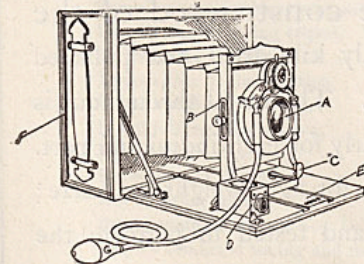
constructed of as few parts as possible, with the best material and finest workmanship, it is without an equal, and is positively the best value for the money on the market. The parts are simple, strong, handsome, and durable, without any attachments confusing to the beginner, making it in all a most durable instrument for the prospective amateur.



CAMERA AND PLATE HOLDER
IN CASE.

Specifications.

1. Polished mahogany case, front and bed.
2. Covering, fine seal grain leather.
3. Bellows, fine maroon leather.
4. Trimmings, polished and lacquered brass.
5. Reversible view finder, brass top.
6. Rising and falling front.
7. Time, instantaneous, finger, and pneumatic release shutter.
8. Iris diaphragm.
9. Plate and roll holder adapter.
10. Ground glass and focussing scale.
11. Two tripod nuts.
12. Leather handle.
13. Carrying case.
14. One double plate holder.
15. One instruction book.



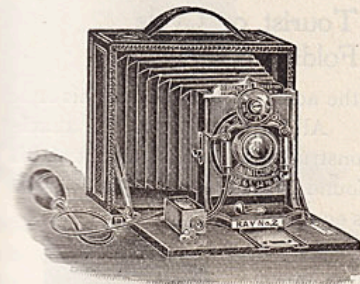
- A Shutter and lens.
- B Rising and falling front.
- C Clamp screw.
- D Reversible view finder.
- E Sliding bed plate.
- F Plate and roll holder adapter.
- G Pneumatic release.

PRICE.

STYLE.	4 x 5.	5 x 7.
1. Ray shutter, single achromatic lens,	\$10.00	\$16.00
2. Ray shutter, R. R. lens,	12.00	18.00
3. Unicum shutter, single achromatic lens,	14.00	20.00
4. Unicum shutter, R. R. lens,	15.00	22.00
Extra double holders,	1.00	1.25

RAY CAMERAS.

Series No. 2.



Tourist or Cycle Folding Camera.

This style comprises all the specifications of the preceding one, with the addition of several new features and attachments demanded by more experienced amateurs.

The rack and pinion focussing attachment makes it very desirable for fine focussing, also the sliding front movement will be found convenient in making vertical pictures. The detachable lens board is an especially handy arrangement, whereby the shutter and lens can be removed and a wide angle or any other lens inserted in an instant, thus doing away with unscrewing the shutter, whereby the fine mechanism is often injured, and the annoyance caused by different sized lens flanges is avoided. Extra duplicate lens boards can be secured at any time and fitted to any lens it is desirable to use in the camera.

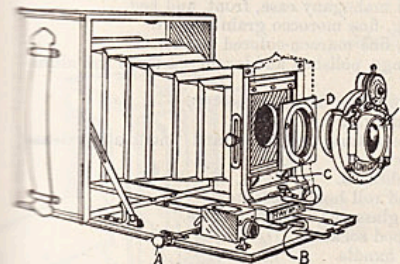


CAMERA CLOSED.

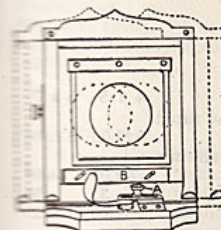
4 x 5 size, 2 1/4 x 5 1/4 x 6.
5 x 7 size, 2 3/8 x 6 1/4 x 8 1/4.
Weight, 4 x 5, 30 ounces.
" 5 x 7, 3 1/2 pounds.

Specifications.

1. Polished mahogany case, front and bed.
2. Covering, fine seal grain leather.
3. Bellows, maroon colored leather.
4. Trimmings, polished and lacquered brass.
5. Reversible view finder, brass top.
6. Rising and falling front.
7. Time, instantaneous, finger, and pneumatic release shutter.
8. Iris diaphragm.
9. Plate and roll holder adapter.
10. Ground glass and focussing scale.
11. Two tripod nuts.
12. Leather handle.
13. Sole leather carrying case.
14. One double plate holder.
15. Sliding front.
16. Detachable lens board.
17. Rack and pinion focussing attachment.
18. One instruction book.



- A Pinion for focussing.
- B Rack and bed plate.
- C Sliding front.
- D Detachable lens board.
- E Shutter and lens.



STYLE.

PRICE.

	4 x 5.	5 x 7.
1. Unicum shutter, R. R. lens,	\$20.00	\$24.00
2. Unicum shutter, rapid symmetrical lens,	22.50	27.50
Extra lens boards fitted, . . . . .	.35	.50
Extra double plate holders,	1.00	1.25

RAY CAMERAS.

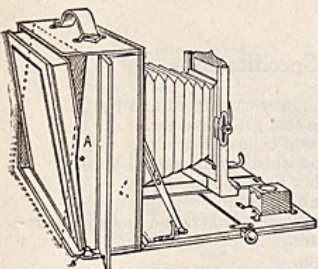
Series No. 3.

Tourist or Cycle Folding Camera.

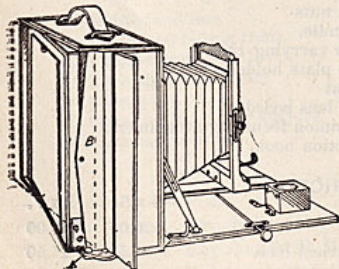
This is the acme of perfection in this style of a camera. All the movements and attachments ever constructed in an instrument of this size will be found in this series. In addition

to all the advantages of the preceding styles this is equipped with a double swing back, whereby the camera, instead of being held or set perfectly level, can be pointed up or down, and the ground glass swung into a vertical position, keeping the perpendicular lines on the image parallel.

The swing frame is made of aluminum, thus greatly decreasing the weight and still leaving it very stiff and rigid in position. The whole is highly polished and lacquered, giving it a very handsome appearance. A door on the end of the camera opens where it is desirable to use the swings. All swings are pivoted at the centre, which is optically correct, and allows the focussing scale to be used without focussing as for ordinary exposures.



A Vertical swing.



B Horizontal swing

Specifications.

1. Polished mahogany case, front, and bed.
2. Covering, fine morocco grain leather.
3. Bellows, fine maroon-colored leather.
4. Trimmings, polished and lacquered brass and aluminum.
5. Reversible view finder, brass top.
6. Rising and falling front.
7. Time, instantaneous, finger, and pneumatic release shutter.
8. Iris diaphragm.
9. Plate and roll holder adapter.
10. Ground glass and focussing scale.
11. Two tripod sockets.
12. Leather handle.
13. Sole leather carrying case.
14. One double plate holder.
15. Sliding front.
16. Detachable lens board.
17. Rack and pinion focussing attachment.
18. Horizontal swing back.
19. Vertical swing back.
20. Instruction book.

STYLE.	PRICE.	4 x 5.	5 x 7.
1. Including Unicum shutter and rapid symmetrical lens,	\$25.00	\$32.00	
2. Including B. & L. diaphragm shutter, rapid universal lens,	42.00	54.00	
Extra lens boards fitted, . . . . .	.35	.50	
Extra plate holders, each,	1.00	1.25	



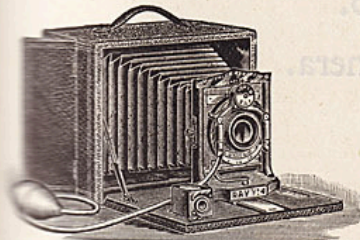
CAMERA CLOSED.
Size, 4 x 5, 6 3/4 x 2 1/2 x 5 1/2.
" 5 x 7, 8 1/2 x 3 x 6 1/2.
Weight, 4 x 5, 2 lbs. 2 oz.
" 5 x 7, 3 lbs.

RAY CAMERAS.

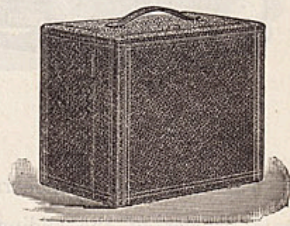
Series No. 4.

Folding Camera.

This is one of the most popular styles of folding cameras, and is almost identical in construction with our Series No. 1, the only difference being that it is provided with a

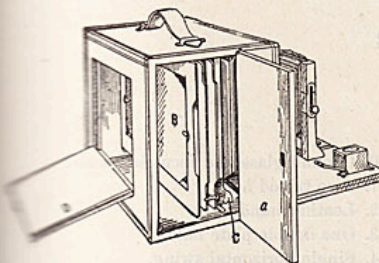


horizontal swing, and the case is extended back sufficient to hold three double plate holders, or roll holder. It is also provided with a ground glass and door in the back for focussing. The solid bed plate, rising and falling front, are the same as those used in Series No. 1. No carrying case is necessary with this style, as the camera itself holds the extra holders, which can be removed and inserted by opening the door on the end, thus making it easier and quicker to manipulate than when the camera and holders have to be taken from the case to make an exposure. This has been a favorite style with amateurs for the past two seasons, and the improvements and fine workmanship which we have put in the construction make it an ideal instrument for the low price at which it is offered.



CAMERA CLOSED.
Size, 4 x 5, 7 x 4 1/2 x 5 1/2.
" 5 x 7, 9 1/2 x 5 1/2 x 6 1/2.
Weight, 4 x 5, 2 lbs. 6 oz.
" 5 x 7, 3 lbs. 3 oz.

Specifications.



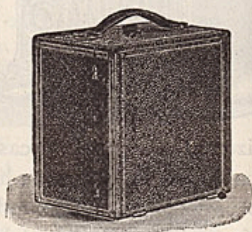
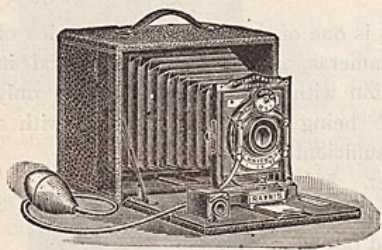
- a. End door open to operate the swing-back or insert the plate holders.
- b. Ground glass.
- c. Horizontal swing.
- d. Back door, which opens to locate image on ground glass.

1. Polished mahogany case, bed and front.
2. Covering, fine seal grain leather.
3. Bellows, fine maroon leather.
4. Trimmings, polished and lacquered brass.
5. Reversible view finder, brass top.
6. Rising and falling front.
7. Time, instantaneous, finger, and pneumatic release shutter.
8. Iris diaphragm.
9. Capacity, three double plate holders, or roll holder.
10. Ground glass and focussing scale.
11. Two tripod nuts.
12. Leather handle.
13. One double plate holder.
14. Single horizontal swing.
15. Instruction book.

STYLES.	PRICE.	4 x 5.	5 x 7.
1. Ray shutter, single achromatic lens,	\$10.00	\$16.00	
2. Ray shutter, R. R. Lens,	12.00	18.00	
3. Unicum shutter, single achromatic lens,	14.00	20.00	
Unicum shutter, R. R. lens,	16.00	22.00	
Extra double holders,	1.00	1.25	

RAY CAMERAS.

Series No. 5. Folding Camera.



CAMERA CLOSED.
Size, 4 x 5, 7 x 4½ x 5½.
" 5 x 7, 9½ x 5½ x 6½.
Weight, 4 x 5, 2½ lbs.
" 5 x 7, 3 lbs. 6 oz.

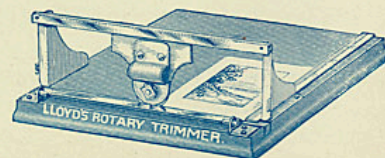
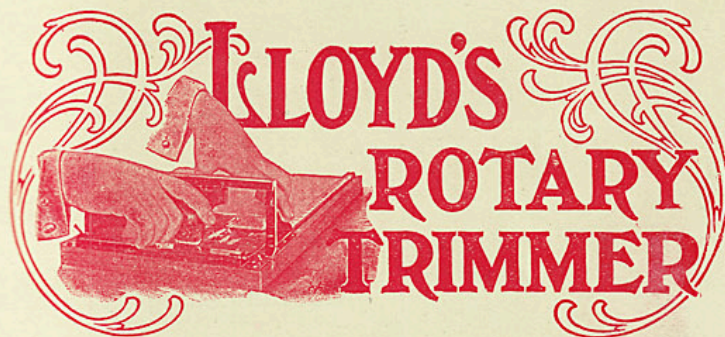
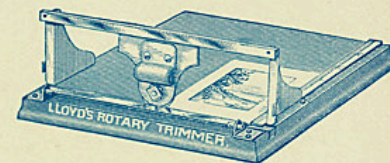
This is similar in appearance to the No. 4 series, and the additional improvements consist of the sliding front, detachable lens board, and rack and pinion focussing attachment described in our series No. 2. This, as in the preceding styles, has a capacity of three double plate holders, or roll holder, also a single horizontal swing. It has a Unicum shutter, and may be fitted with either a rapid rectilinear or a symmetrical lens, according to the style desired. It may be easily adapted to cartridge film, which may be loaded in daylight.



Specifications.

- | | |
|--|---|
| 1. Polished mahogany case, bed, and front. | 10. Ground glass and focussing scale. |
| 2. Covering, fine seal grain leather. | 11. Two tripod nuts. |
| 3. Bellows, fine maroon leather. | 12. Leather handle. |
| 4. Trimmings, polished and lacquered brass. | 13. One double plate holder. |
| 5. Reversible view finder, brass top. | 14. Single horizontal swing. |
| 6. Rising and falling front. | 15. Detachable lens board. |
| 7. Time, instantaneous, finger, and pneumatic release shutter. | 16. Sliding front. |
| 8. Iris diaphragm. | 17. Rack and pinion focussing attachment. |
| 9. Capacity, three double plate holders, or roll holder. | 18. One instruction book. |

STYLES.	PRICE.	4 x 5.	5 x 7.
1. Unicum shutter, R. R. lens,		\$20.00	\$24.00
2. Unicum shutter, rapid symmetrical lens,		22.50	27.50
Extra double holders,		1.00	1.25
Extra lens board,		.35	.50



Lloyd's Rotary Trimmer.



CUTS quick.
clean.
true.
without buckling the
prints.
for years without
sharpening.

Constructed on the right plan.

Not like any other trimmer.

Not an experiment, but a success.

Guaranteed by the manufacturers.

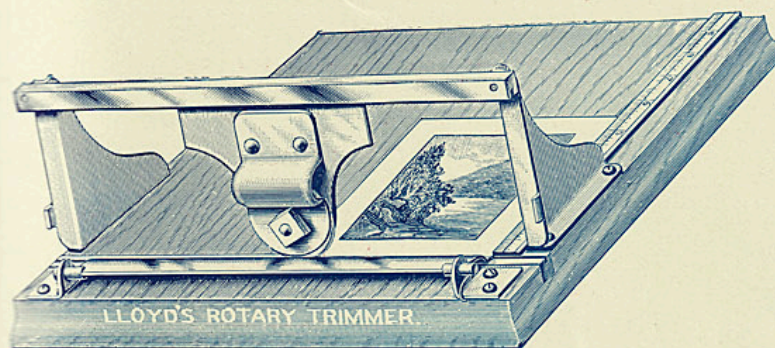
It's simplicity itself.

Hard to get out of order.

FOR home use.
office use.
professionals' use.
amateurs' use.
every use.

A trimmer that has individuality.

"The most widely advertised trimmer in the world."



A careful examination of these illustrations will show you, as nearly as cuts can, what Lloyd's Rotary Trimmer is like. Too much cannot be said in its favor. Although only a year old, this trimmer is widely known. The amateurs as well as the professionals approve of it, and why not? It does the work where all others have failed. The prices are right: you can buy them as low as from \$2.50 to \$5.50, and get the same merit in any one. The difference is in the

The Lloyd Rotary Trimmer

consists of a sharp-edged wheel, that runs in a groove and cuts the paper, which is held in place by a pressure plate. When you come to the end of the groove, the plate lifts itself automatically, and the work is done. The wheel sharpens itself by its action in the groove, thus keeping sharp until it wears out. A prime characteristic is that it must cut the paper straight: the paper can't buckle or curl up during the cutting, thus making an oblique edge. An accurate rule provides for cutting in desired lengths. The cut edge will be a revelation: it will be perfectly clean, without shreds, fringes, or nicks.

LLOYD'S ROTARY TRIMMER



PRICES

- No. 1. 7-inch, \$2.50
 No. 2. 8½-inch, 3.00
 No. 3. 10-inch, 3.50



It will be handier to ask your dealer to show you a Lloyd Trimmer. If he hasn't it, send us a money order at the above prices and your dealer's name. We will send you the trimmer at once and prepay express charges.

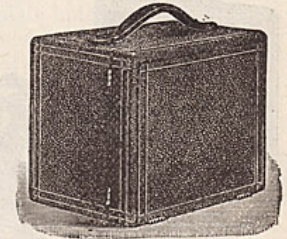
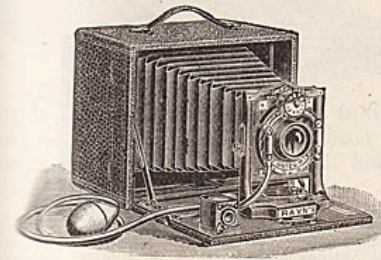


Andrew J. Lloyd & Co.

323 Washington Street, Boston

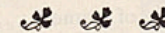
RAY CAMERAS.

Series No. 6.
Folding Camera.



CAMERA CLOSED.
 Size, 4 x 5, 7 x 4½ x 5½.
 " 5 x 7, 9½ x 5½ x 6½.
 Weight, 4 x 5, 2 lbs. 10 oz.
 " 5 x 7, 3½ lbs.

This series, as in our No. 3 cycle style, comprises all the movements it is possible to apply in a hand camera, and supplies the demand of the most fastidious amateur, and is guaranteed, for convenience, appearance, and elegant workmanship, to be without a peer. The lenses for this series have particular attention, and nothing but the best is good enough. To all who desire the best that money can buy anywhere we heartily recommend this design. The shutter is the Unicum, which may be operated by either pneumatic or finger release, and may be varied in exposures from 1/100 second to one second, automatic, or time and bulb exposures.



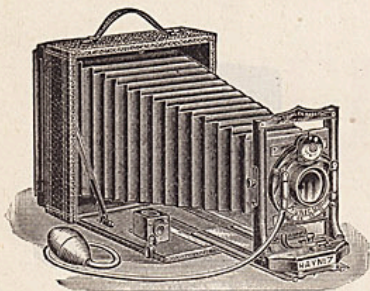
Specifications.

1. Polished mahogany case, bed, and front.
2. Covering, fine seal grain leather.
3. Bellows, fine maroon leather.
4. Trimmings, polished and lacquered brass.
5. Reversible view finder, brass top.
6. Rising and falling front.
7. Time, instantaneous, finger, and pneumatic release shutter.
8. Iris diaphragm.
9. Capacity, three double plate holders, or roll holder.
10. Ground glass and focussing scale.
11. Two tripod nuts.
12. Leather handle.
13. One double plate holder.
14. Detachable lens board.
15. Sliding front.
16. Rack and pinion focusing attachment.
17. Horizontal swing.
18. Vertical swing.
19. Instruction book.

STYLES.	PRICE.	4 x 5.	5 x 7.
1. Unicum shutter, rapid symmetrical lens,		\$25.00	\$32.00
2. Bausch & Lomb diaphragm shutter and rapid universal lens,		42.00	54.00
Extra double plate holders,		1.00	1.25
Extra lens boards, . . . . .		.35	.50

RAY CAMERAS.

Series No. 7. Long Focus, Reversible Back.



This camera possesses some distinctly new features not obtained in any other camera on the market, and is especially designed for convertible anastigmat or high-grade lenses with variable focus. It is constructed with an auxiliary bed, which can be racked out over the ordinary bed to almost its entire length, giving a variation of focus in the 4 x 5 size of from 4 1/2 to 12 inches, and in the 5 x 7 size from 5 to 15 inches.

The auxiliary bed is made of aluminum so formed as to make it extremely rigid; and its highly polished surface, in contrast with the polished and lacquered brass and mahogany finish, makes it an extremely attractive and elegantly finished camera.

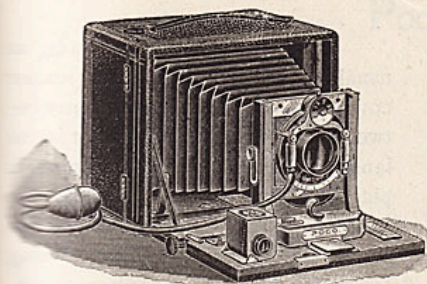
The other feature is the reversible back, by means of which pictures can be taken vertically or horizontally without changing the position of the camera on the tripod. It is also provided with swing back, rising and sliding front, and everything that constitutes the highest grade of camera.

Specifications.

- | | |
|--|--|
| 1. Polished mahogany case, bed and front. | 10. Ground glass and focussing scale. |
| 2. Covering, fine morocco grain leather. | 11. One tripod nut. |
| 3. Bellows, fine maroon, extra long. | 12. Leather handle. |
| 4. Trimmings, polished and lacquered brass and aluminum. | 13. One double holder. |
| 5. View finder, brass top. | 14. Sliding front. |
| 6. Rising and falling front. | 15. Detachable lens board. |
| 7. Time, instantaneous, finger, and pneumatic release shutter. | 16. Aluminum auxiliary bed. |
| 8. Iris diaphragm. | 17. Double rack and pinion focussing attachment. |
| 9. Sole leather carrying case. | 18. Swing back. |
| | 19. Plate holder adapter. |
| | 20. Reversible back. |

Style.	PRICES.	4 x 5.	5 x 7.
1. Unicum shutter, rapid symmetrical lens,		\$30.00	\$35.00
2. Diaphragm shutter, rapid universal lens,		50.00	60.00
3. Diaphragm shutter, Zeiss anastigmat lens, series VIIa,		100.00	125.00
		Lens No. 3.	Lens No. 8.

Poco A.



These cameras are made of fine mahogany throughout, with brass trimmings, and covered with fine morocco leather.

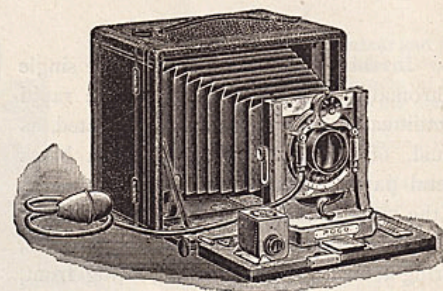
There is a double swing back, which may be held firmly in any position. The ground glass recedes, so as to receive the plate holders, which are of an entirely new construction.

The optical equipment is the Rochester symmetrical lens, fitted with the Bausch & Lomb Unicum shutter, giving hand or pneumatic exposures from one second to 1-100 of one second. Or, if desired, a B. & L. diaphragm shutter may be fitted on the same lens. The 4 x 5 size will hold four holders, or roll holder; the 5 x 7 size, three holders, or the roll holder.

PRICES.

	4 x 5.	5 x 7.	6 1/2 x 8 1/2.	8 x 10.
Complete, with Unicum shutter, lens, and one plate holder,	\$25.00	\$32.00	\$40.00	\$50.00
Complete, with B. & L. diaphragm shutter, lens, and one holder,	33.00	40.00	50.00	62.00
Complete, Unicum shutter, Rochester anastigmat lens, and one holder,	50.00	60.00	90.00	110.00
Lens, for R. C. Co.'s wide angle lens,	8.00	10.00	15.00	18.00
With Unicum shutter, other lens fitted,	24.00	30.00	35.00	40.00
Camera, no lens or shutter,	15.00	20.00	26.00	35.00
Slide dry plate holders, . . . . .	.75	1.00	1.25	1.50
Roll holders, 4 x 5 and 5 x 7, daylight loading,	5.00	6.50		
Leather case and strap,	2.50	3.00	3.50	4.00
Weights,	2 1/2 lbs.	3 1/2 lbs.	4 1/2 lbs.	5 lbs.
Measurements,	5 1/2 x 4 1/2 x 6 1/2	5 x 7 1/2 x 7	6 1/2 x 11 x 8 1/2	10 1/2 x 6 1/2 x 12 1/2

Poco B.



One of the most popular of the series. It is made of polished mahogany, leather covered, with neat lacquered brass trimmings. The single swing back, operated from the centre, is optically correct. It has a rising front, and spring-actuated ground glass, an extra large panel at the rear for focussing, and the combined view finder and level. A rack and pinion make focussing easy.

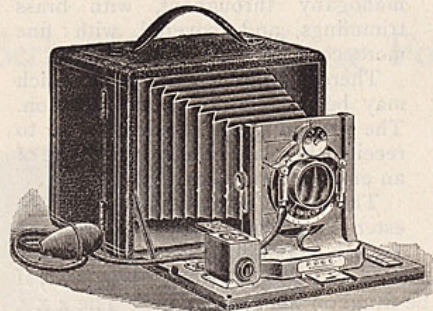
Optically the equipment is the same as Poco A. In fact, the only difference between these cameras is a double swing and sliding front in place of single swing and front on B model.

The lens is a Rochester symmetrical, fitted with the standard B. & L. Unicum shutters, with iris diaphragms, having pneumatic and finger releases for time bulb, and instantaneous exposures.

PRICES.

	4 x 5.	5 x 7.
Camera complete, with shutter, lens, and one dry plate holder,	\$20.00	\$25.00
Complete, with Rochester anastigmat lens, etc.,	45.00	55.00
R. C. Co.'s wide angle lens,	8.00	10.00
Without lens or shutter,	14.00	18.00
Slide dry plate holders, . . . . .	.75	1.00
Roll holders, daylight loading,	5.00	6.50
Leather case, with shoulder strap,	2.50	3.00
Weights,	2 1/2 lbs.	3 1/2 lbs.
Measurements,	5 1/2 x 4 1/2 x 6 1/2	5 x 9 1/2 x 7

Poco C.



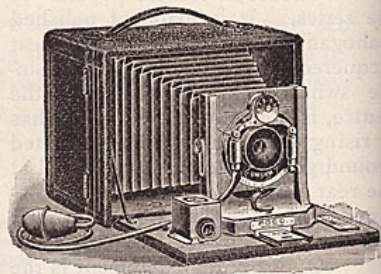
This is a new model, made, as usual, of polished mahogany, leather covered. There is no difference between models B and C, except in the lens, which is a rapid rectilinear in place of the symmetrical, and the absence of rack and pinion. It has single swing, rising front, receding spring-actuated ground glass screen, and Poco combined level and finder. Shutter is the Unicum, with iris diaphragms, on uniform system, and bulb, time, and instantaneous releases. A wide angle lens may be supplied, which will interchange in the same shutter.

PRICES.

	4 x 5.	5 x 7.
Camera, complete, with shutter, rapid rectilinear lens, and one dry plate holder,	\$14.00	\$18.00
Without lens and shutter,	10.00	14.00
Double dry plate holder,	.75	1.00
Rack and pinion extra,	3.00	3.00
Roll holder, daylight loading,	5.00	6.50
Sole leather carrying case and shoulder strap,	2.50	3.00

Poco D.

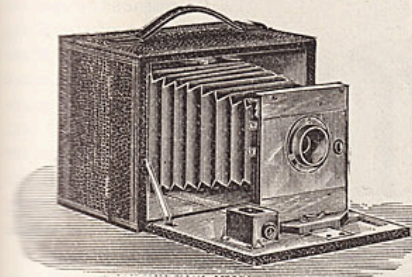
In this camera we have a fine single achromatic lens in place of the rapid rectilinear. The camera is constructed, as usual, of polished mahogany, with brass metal parts, showing the same contrast as in the more expensive instruments. It has a Unicum shutter, with iris diaphragms, spring-actuated ground glass, rising front, and single swing back. Or, if desired, a Poco shutter without retarding device may be substituted for the Unicum. It takes the new Poco plate holder, which dispenses with all troublesome springs, as in the old styles.



PRICES.

	4 x 5.	5 x 7.
Camera, complete, with one dry plate holder,	\$12.00	\$16.00
Double dry plate holders,	.75	1.00
Roll holders, daylight loading,	5.00	6.50
Sole leather carrying case, with shoulder strap,	2.50	3.00

Poco E.



The E model has a shutter which is combined with the camera front. This shutter is set by winding the milled head on the front until it catches. One lever gives instantaneous exposure; while two pressures, one on time followed by one on instantaneous, open and close the shutter for time exposure.

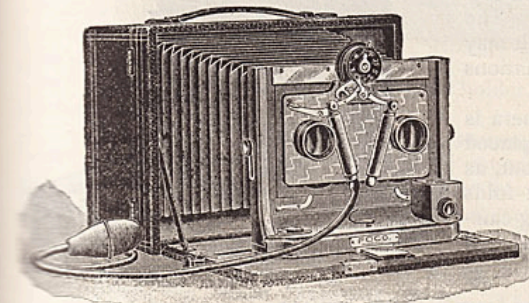
There are three speeds, controlled by a tension spring at the base of the front board. Poco combined finder and level is supplied. This finder is reversible.

The lens is a high-grade single achromatic, which covers the plate perfectly.

PRICES.

	4 x 5.	5 x 7.
Camera, complete, with shutter, single achromatic lens, and one dry plate holder,	\$8.00	\$12.00
Double dry plate holder,	.75	1.00
Roll holder, daylight loading,	5.00	6.50
Sole leather carrying case and shoulder strap,	2.50	3.00

Stereo Poco Camera.



Made for both amateur and professional use. It is similar in design to Series A, with exception of the wide front which holds the stereoscopic lenses. It has double swing-back, rack and pinion, double tripod plates.

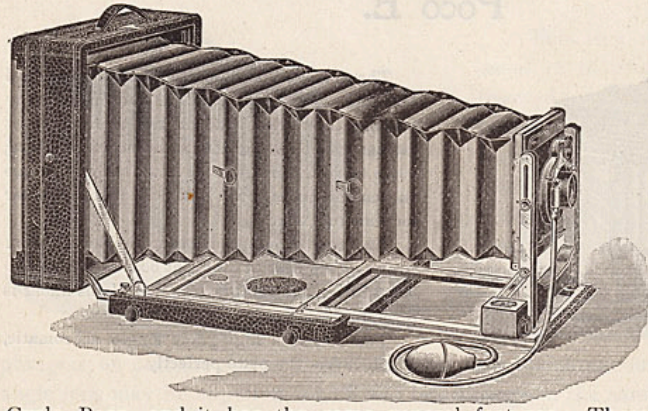
The shutter is the Bausch & Lomb stereo, which works automatically from three seconds to one-hundredth part of a second, with hand and pneumatic release, and time lever. The lenses are a matched pair of Rochester symmetricals, rectilinear and free from distortion.

Wide angle lenses are interchangeable in the same cells; and, if 5 x 7 single pictures are desired, 5 x 7 lens and shutter with an extra lens board may be supplied.

PRICE.

	5 x 7
Stereo camera, lenses, and shutter, and one plate holder,	\$55.00
Pair wide angle lenses,	16.00
Double dry plate holders,	1.00
Sole leather carrying case and shoulder strap,	3.00
5 x 7 lens and Unicum shutter, extra,	15.00

The King Poco.

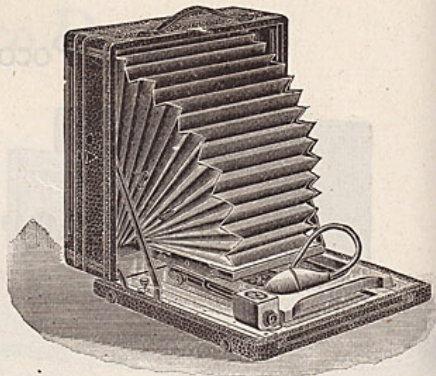


Cycle Poco, and it has the same general features. There is an extension bed, with two pinions for focussing. This enables the use of convertible or long focus lenses. When the long draw is used, the body may be pushed backward, so that the camera will balance well on the tripod. When extreme wide angles are used, the operation is reversed: the body comes forward, so that a lens of extreme angle may be used without the bed cutting off the view.

The back is reversible, and has a single swing, which may be securely clamped in place. When not in use, it forms a solid joint with the main camera body, so that the focussing scale may be used with accuracy for rapid work. The front rises and falls, and has a swinging motion, which may be used in place of the swing back.

The shutter is the Unicum, with iris diaphragms, and either pneumatic or finger release. It has instantaneous automatic exposures from $\frac{1}{100}$ second to 1 second, bulb and time exposures. The lens is a rapid symmetrical, which may be halved, and the single combinations used for making larger images.

The peculiarity of this camera is the method in which the front is placed in position. Instead of sliding out, as in the regular folding cameras, it folds down, similarly to the larger King cameras, and may be quickly swung upward and clamped into place.



MEASUREMENTS AND WEIGHTS.

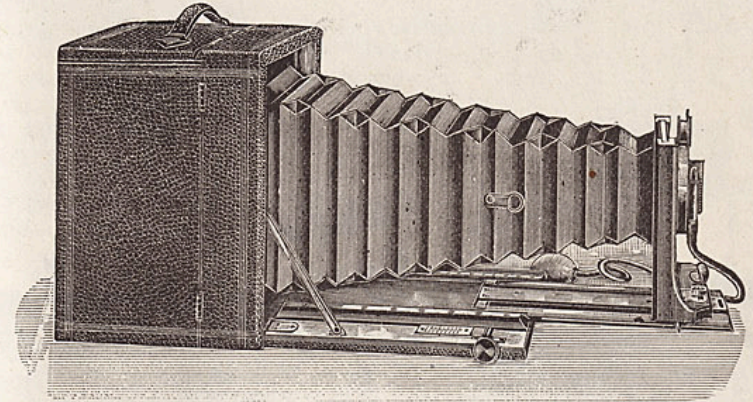
	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Size, closed,	6 x 6 x 3½	8½ x 8½ x 3½	10 x 10 x 3½	11½ x 11½ x 4
Focal length,	14 in.	17½ in.	21½ in.	25½ in.
Weight,	2½ lbs.	3½ lbs.	4½ lbs.	6½ lbs.
Complete, with Unicum shutter, lens, and one plate holder,	\$40.00	\$50.00	\$65.00	\$75.00
Complete, with Unicum shutter, Rochester anastigmat lens, one plate holder, etc.,	65.00	80.00	110.00	130.00
Complete, with B. & L. shutter, Zeiss convertible anastigmat lens, series VII,	No. 5. \$105.00	No. 8. \$125.00	No. 11. \$160.00	No. 17. \$250.00
Without lens or shutter,	35.00	40.00	50.00	55.00

* Unicum only.

This is a new design entirely. It combines the special features of the King and the Poco cameras, and is the most complete hand camera ever put out. Every adjustment which is needed for the use of either long focus or wide angle lenses is present.

In outward appearance it resembles the Telephoto

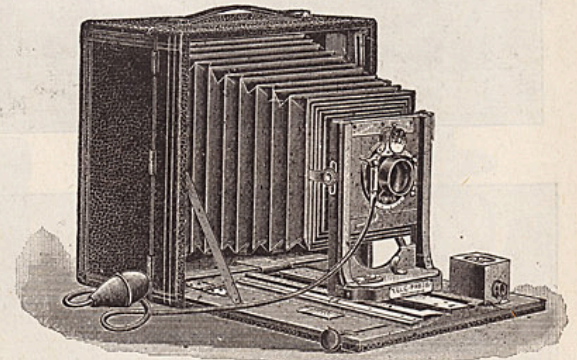
Telephoto Poco A.



This camera is a trifle larger than the ordinary on account of the reversible back. There is an extension front, operated by a rack and pinion, which gives a bellows extension capable of using long focus lenses or for copying.

The front rises and falls; and it has a large front board, so that new lenses may be readily fitted. The swing back is spring actuated, and recedes for the plate holder. The back is reversible, and it has double swings, both pivoted on the centre.

The lens is a symmetrical, very rapid, and capable of being split up so that either combination may be separately used in connection with the long draw. It has Unicum shutter, with iris diaphragms, and release by pneumatic bulb or finger. The exposures may be varied automatically from one second to $\frac{1}{100}$ part of a second, or made time or bulb.

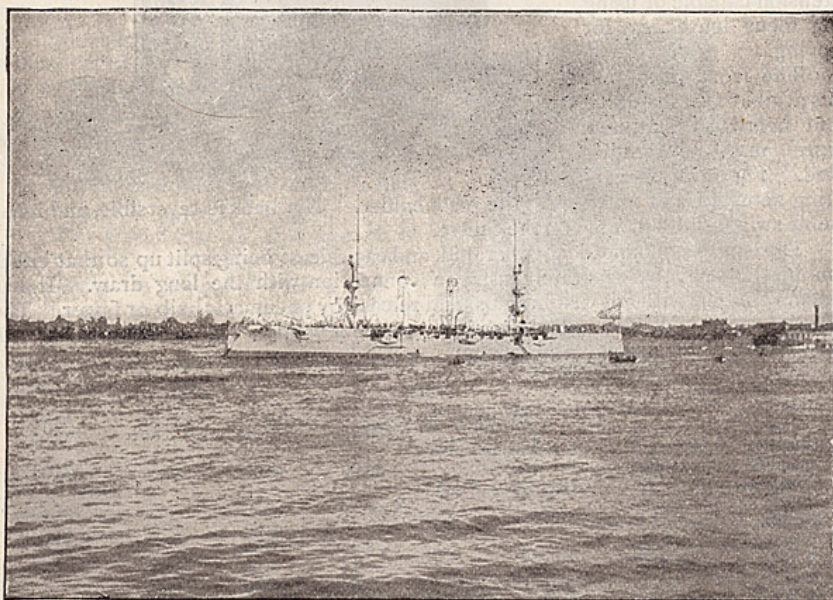
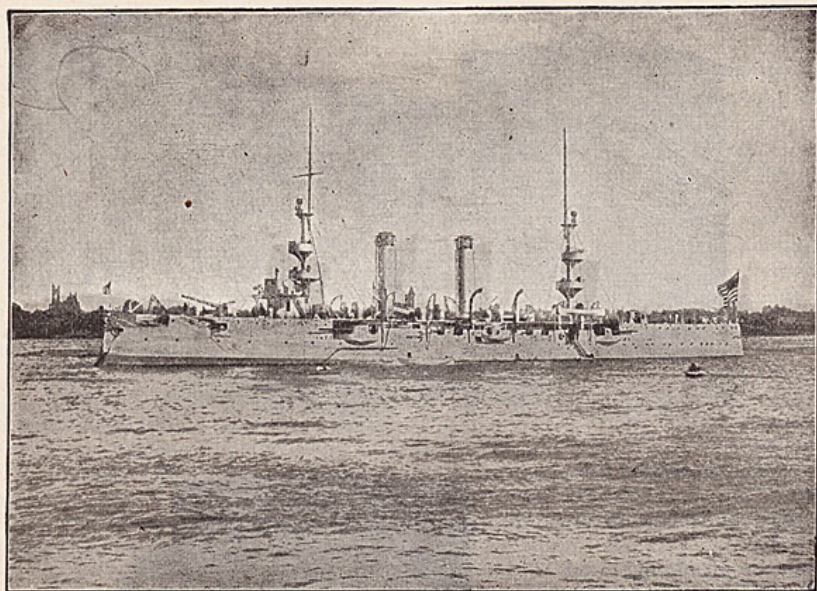


PRICE.

	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Complete, with Unicum shutter, lens, and one double plate holder,	\$30.00	\$35.00	\$45.00	\$55.00
Complete, with B. & L. shutter, lens, and one double plate holder,	38.00	48.00	58.00	70.00
Complete, with B. & L. shutter, Zeiss VII.A lens, and plate holder,	*105.00	115.00	150.00	235.00
Camera, no lens nor shutter,	20.00	28.00	35.00	40.00
Wide angle lens, extra,	8.00	10.00	15.00	18.00
Double dry plate holders,	.75	1.00	1.25	1.50
Roll holders (4 x 5, 5 x 7, daylight loading),	5.00	6.50	—	—
Sole leather carrying case and strap,	3.00	3.50	4.50	5.50
Size,	5½ x 7 x 7½.	5½ x 9½ x 9½.	7 x 11 x 11½.	7 x 12½ x 13½.
Focal length,	13½ in.	18 in.	21 in.	24 in.
Weight,	3 lbs.	4 lbs.	5 lbs.	7 lbs.

* Unicum shutter only.

Taken with the Telephoto Poco Cameras.



The smaller image was taken with the double combination of the lenses. The larger one was made with the front lens removed, and the long draw used, without changing the position of the camera.

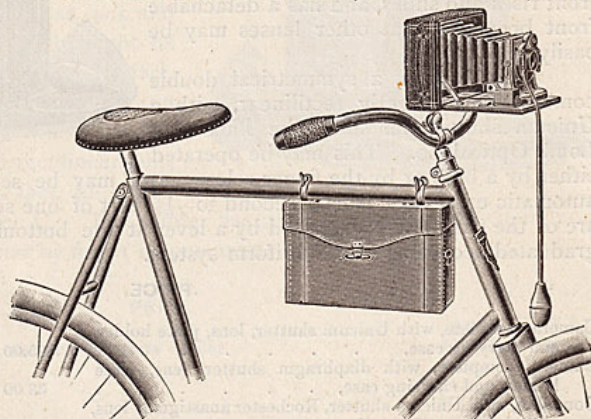
Cycle Poco Cameras.

This series is designed especially for wheelmen and other tourists, who wish a complete outfit in the smallest space. The price on each camera includes the carrying case, which will hold the camera and extra holders, or a roll holder, which will carry the Eastman cartridge films, loading in broad daylight.

It has a leather handle for use in hand, and rings on the ends by which a shoulder strap may be attached. It may be rigidly attached to the bicycle frame by means of the Poco bicycle carrying attachment.

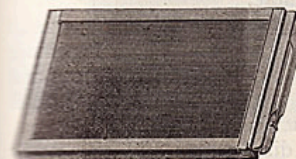
All Cycle Pocos are finished in mahogany, with brass parts highly polished and lacquered. They are covered with fine

seal grain morocco leather, with handle, and red Russia leather bellows.



If desired, the camera may be mounted on the handle bar, as in the illustration. This is done by means of the Poco bicycle clamp, which has a tripod head with a screw fitting the camera, mounted on a ball and socket joint. This may be adjusted to any handle bar. The new style Poco plate holder is supplied with each camera.

The feature of this plate holder is the method of holding the plates in position. The end opposite the valve in the holder is hinged and locked by means of the plate slide.

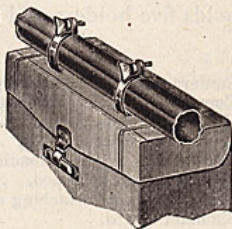
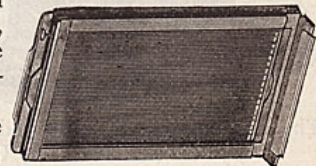
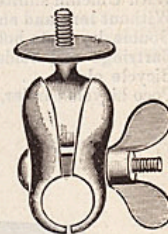


This dispenses with all troublesome springs, and avoids all chance of scratching or breaking the plates.

Each case holds five holders in the 4 x 5 size and four holders

in the 5 x 7. Telephoto Cycle Poco, 4 x 5, holds six holders; and King Poco, 4 x 5, holds seven.

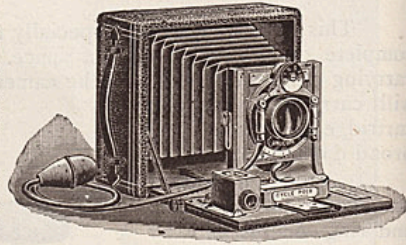
The camera may be carried in the diamond space of the bicycle frame by means of the cycle camera carrier, which clamps the case securely to the top bar. A special snap catch prevents the case from opening by accident.



Cycle Poco, No. 1.

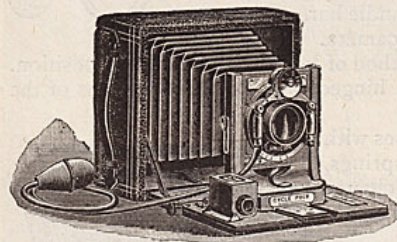
This camera is designed especially for the tourist and wheelman. There is a double swing and receding plate back, and rack and pinion for fine focussing. The front rises and slides, and has a detachable front board, so that other lenses may be easily fitted.

The lens is a symmetrical double combination, perfectly rectilinear, with a Unicum shutter, made by the Bausch & Lomb Optical Co. This may be operated either by a bulb or by the finger release, and may be set either on time, bulb, or automatic exposures, from 1 second to $\frac{1}{100}$ part of one second. The diaphragms are of the iris pattern, operated by a lever at the bottom of the shutter, which is graduated according to the uniform system.



	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Camera, complete, with Unicum shutter, lens, plate holder, and carrying case,	\$25.00	\$32.00	\$40.00	\$50.00
Camera, complete, with diaphragm shutter, lens, plate holder, and carrying case,	33.00	40.00	50.00	62.00
Complete, with Unicum shutter, Rochester anastigmat lens, plate holder, and carrying case,	50.00	60.00	90.00	110.00
Wide angle lens, extra,	8.00	10.00	15.00	18.00
With Unicum shutter, other lens fitted,	24.00	30.00	35.00	40.00
Without lens and shutter,	16.00	20.00	26.00	35.00
Double dry plate holders,	.75	1.00	1.25	1.50
Cartridge roll holders,	5.00	6.50		
Bicycle clamp,	.75	.75	.75	.75
Poco bicycle carrier,	1.00	1.00	1.00	1.00

Cycle Poco, No. 2.



Very strong and rigid, light in weight, compact, serviceable, and neat in appearance, of polished mahogany, trimmed with polished and lacquered brass, and covered with best selected morocco grain leather, with leather handle.

It has tripod plates, for both horizontal and vertical pictures, a rack and pinion, but no swing backs. The front rises and falls, and has a detachable front board.

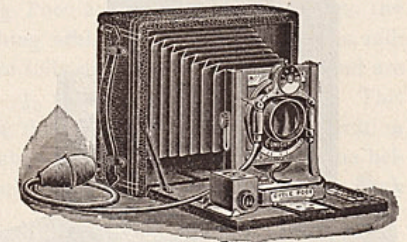
The Poco combined finder and level is supplied with each camera.

Cycle Poco No. 2 has Unicum shutter, with iris diaphragms and the Rochester symmetrical lens. A sole leather case accompanies each camera. The case holds five holders and camera in 4 x 5 size, and four in the 5 x 7.

	4 x 5.	5 x 7.
Camera, complete, with shutter, lens, one dry plate holder, and carrying case,	\$20.00	\$25.00
Complete, with Unicum shutter, Rochester anastigmat lens, one holder, and case,	45.00	55.00
Wide angle lens, extra,	8.00	10.00
Double dry plate holders,	.75	1.00
Roll holders, daylight loading,	5.00	6.50
Bicycle clamp, as tripod,	.75	.75
Poco carrier, for attaching camera to cycle,	1.00	1.00
Shoulder straps,	.25	.25

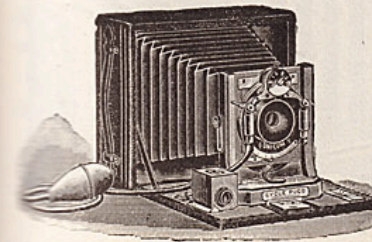
Cycle Poco, No. 3.

In this model the camera is made so that it is extremely strong and serviceable, but without such attachments as rack and pinion, swing backs, etc., which might be termed photographic luxuries. In fact, many bicyclists prefer the solid back, on account of the jar of the wheel on the swing back. It has a rapid rectilinear lens, with Unicum shutter,—in fact, an equipment identical with the Poco C. The shutter has iris diaphragms, time, bulb, and instantaneous releases, either by finger or pneumatic release.



	4 x 5.	5 x 7.
Camera, complete, lens, shutter, case, and one plate holder,	\$14.00	\$18.00
Double dry plate holders,	.75	1.00
Rack and pinion, extra,	3.00	3.00
Roll holders, daylight loading,	5.00	6.50
Wide angle lens, extra,	8.00	10.00
Bicycle clamp,	.75	.75
Poco carrier for attaching case to bicycle,	1.00	1.00
Shoulder strap,	.25	.25

Cycle Poco, No. 4.

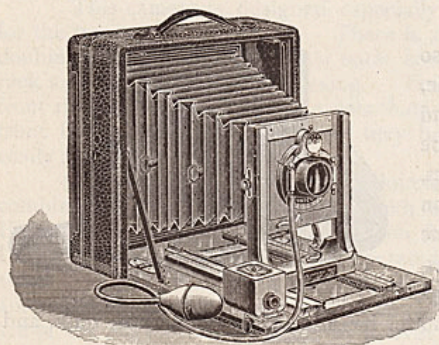


A high-grade achromatic lens takes the place of the rapid rectilinear in the number four series. The camera is mahogany, with a leather covering, and polished brass trimmings. It has a Unicum shutter, with iris diaphragm, and time, bulb, and instantaneous releases, both by finger and by pneumatic pressure. The camera takes the new Poco plate holder and the com-

combined finder and level. There are two tripod plates.

	4 x 5.	5 x 7.
Camera, complete, lens, shutter, case, and one plate holder,	\$12.00	\$16.00
Double dry plate holders,	.75	1.00
Roll holders, daylight loading,	5.00	6.50
Bicycle clamp,	.75	.75
Poco carrier, for attaching case to bicycle,	1.00	1.00
Shoulder strap,	.25	.25

Tele-photo Cycle Poco.



This model combines the efficiency of the Tele-photo Poco A with the compactness of the cycle forms. It is but a trifle larger than the ordinary form, and is sold with the regular light leather case, which will carry six double holders, 4 x 5, and four, size, 5 x 7.

By means of an extra sliding bed, which is run out by a rack and pinion, it is possible to obtain a focal capacity of over double the ordinary, which allows the use of long focus lenses or operations requiring long extension.

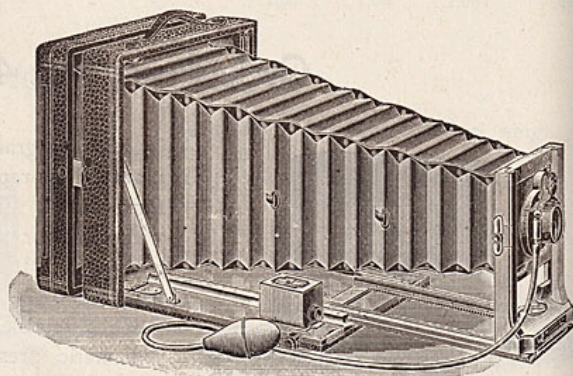
A reversible back, with a receding ground glass screen, is fitted to the rear of the camera. It is also equipped with an ingenious swing back, operated by a set of push buttons. By pressing the buttons on the side, the back of the camera can be extended a half-inch, giving the swing room to operate. This may be locked by the catch on the top.

The shutter is the Bausch & Lomb Umicum, with iris diaphragms, finger and pneumatic release. It has time, bulb, and automatic exposures, from one second to $\frac{1}{100}$ part of one second. The lens is symmetrical and perfectly rectilinear. If a larger picture is desired, either the front or back lens may be used alone, giving an image nearly double the size. To use the lenses alone, the long draw is necessary, as the focal length is doubled and the angle reduced.

The illustrations show the relations between the images of the single and double combinations. One is about twice the focus of the other. If desired, a wide angle lens may be supplied, which will screw into the same shutter.

On account of the slight increase in thickness of the camera, the case will hold an extra plate holder in the 4 x 5 size. A cartridge roll holder for the Eastman cartridge films may be attached in place on the reversing back, thus making it possible to focus while using films.

For high-grade work, where focal plane shutters are required, we fit up special outfits, described on the next page.



PRICE.

	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Complete, with shutter and lens, carrying case, and plate holder,	\$30.00	\$35.00	\$45.00	\$55.00
Complete, with Zeiss VIIA lens,	*105.00	115.00	150.00	235.00
Without lens or shutter,	20.00	28.00	35.00	40.00
Double dry plate holders, . . . . .	.75	1.00	1.25	1.50
Roll holders (4 x 5, 5 x 7, daylight loading),	5.00	6.50	—	—

*Umicum only.

Special Outfit for High-speed Work.

The Telephoto Cycle Poco and King Poco are particularly adapted to the use of the focal plane shutters in photographing athletic events, race finishes, railroad trains, etc. The focal plane shutters are fully described on page 68, and are capable of giving exposures ranging from $\frac{1}{100}$ to $\frac{1}{1000}$ part of a second. This shutter is attached to the back of the camera, does not interfere with the operation of the swing back, and adds nearly three inches to the focal capacity of the bellows. If desired, the shutter may be instantly detached, and the reversible back replaced in its former position.

	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Telephoto Cycle Poco, case, plate holder, focal plane shutter, Zeiss VIIA lens,	\$96.00	\$130.00	\$166.50	\$256.50
King Poco, case, plate holder, focal plane shutter, Zeiss VIIA lens,	111.00	142.00	181.50	271.50

We give here some important instructions about high-speed shutters and the development of these exposures, from the Thornton-Pickard Company.

For instantaneous subjects as long an exposure should be given as the subject will allow. This depends upon the rate of motion and the distance from the camera, both of which affect the movement of the image on the plate during the moment of exposure.

To find the exposure required for a moving object. This may be obtained simply, as follows:—

The distance of the object from the camera, measured in inches, must be divided by the number of yards per hour at which the object is travelling, and then multiplied by the focus of the lens in inches.

The result will be the fraction of a second which is the longest allowable exposure that does not show movement in the resulting picture.

Putting this into a simple formula, we get

$$\left. \begin{array}{l} \text{Exposure,} \\ \text{in fractions of a second} \end{array} \right\} = \frac{\text{Distance of object from camera in inches.}}{\text{Yards per hour} \times \text{focus of lens in inches.}}$$

For example, supposing that the object is 50 feet from the camera, and the focus of lens 6 inches, while the movement of the object is at the rate of 12 miles per hour, we get.

$$\text{Exposure} = \frac{50 \text{ (feet)} \times 12 \text{ (to reduce to inches)}}{12 \text{ (mils.)} \times 1,760 \text{ (yds. in a mile)} \times 6 \text{ (in. focus)}} = \frac{600}{126720} = \frac{1}{211} \text{ of a sec. (about).}$$

This does not allow for movement of limbs, etc., which is always more rapid than that of the object itself, and a shorter exposure will be necessary in consequence. On the other hand, if the object is not moving broadside to the camera, a longer exposure is allowable.

Below is given a table showing the correct exposure that should be given for various moving objects.

The table is made out for a distance from the camera one hundred times that of the focus of the lens,—that is, for a 6-inch focus lens at 50 feet, a 7-inch at 58 feet, an 8-inch at 67 feet, a 9-inch at 75 feet, or 12-inch at 100 feet.

	Towards the camera.	At right angles to the camera.
Man walking slowly, street scenes,	$\frac{1}{15}$ second	$\frac{1}{15}$
Cattle grazing,	$\frac{1}{15}$ "	$\frac{1}{15}$
Boating,	$\frac{1}{20}$ "	$\frac{1}{20}$
Man walking, children playing, etc.,	$\frac{1}{40}$ "	$\frac{1}{20}$
Pony and trap, trotting,	$\frac{1}{100}$ "	$\frac{1}{30}$
Cycling, ordinary,	$\frac{1}{100}$ "	$\frac{1}{30}$
Man running a race, and jumping,	$\frac{1}{150}$ "	$\frac{1}{30}$
Cycle racing,	$\frac{1}{200}$ "	$\frac{1}{30}$
Horses galloping,	$\frac{1}{200}$ "	$\frac{1}{30}$

If the object is twice the distance, the length of allowable exposure is doubled, and vice versa.

Development.

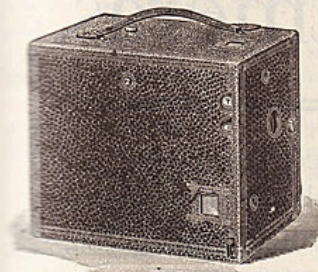
FOR THE DEVELOPMENT OF INSTANTANEOUS PHOTOGRAPHS we use the three necessary constituents only, viz., dry pyro, ammonia, and bromide, in the following proportions: pyrogallic acid (dry), 2 grains; bromide of potassium, 1 grain; liquid ammonia, .880, 2 minims; water, 1 oz. (The bromide and ammonia are conveniently kept as 10 per cent. solutions.) If under-exposed, dilute the developer with an equal bulk of water, and add 25 per cent. extra ammonia.

IN EXTREME CASES we take the above developer and dilute it with five times its usual bulk of water. Development will be very slow, but detail should appear all over the plate. In ten minutes add an amount of ammonia equal to 25 per cent. of that already used, to make up for that which has evaporated. Repeat the same at the end of the next ten minutes. After the developer has been used for about half an hour, replace it by another made up as at first, and continue the operation in the same manner. After an hour probably no further detail may be coaxed out. Usually sufficient density is obtained at the end of an hour (and much sooner, except in extreme cases), but, if not, sufficient density may be obtained by applying a normal developer for a short time.

ROCK THE DISH. When using pyro, the developer must be kept moving all the time, or the negative will be covered with spots, etc. We use a simple form of rocking table, which is kept in motion by a heavy weight. Four or five plates in a large or in separate dishes may be kept going at the same time, and attended to as required.

COVER THE DISH. During development the dish should be covered with the lid of a large-sized plate box, or other means, so as to avoid fogging the plate by the continuous light of the dark-room lamp

THE MAGAZINE POCO.



This camera is neat and compact, taking twelve pictures at one loading. It is so simple in construction that it is practically impossible to get it out of order or to make an error in its manipulation.

The camera is made in the best possible manner, covered with morocco grain leather, with leather handle, and fitted with two large square view finders and two tripod plates.

The shutter is the Rochester Safety, arranged for time and instantaneous exposures, together with speed regulator and revolving diaphragm.

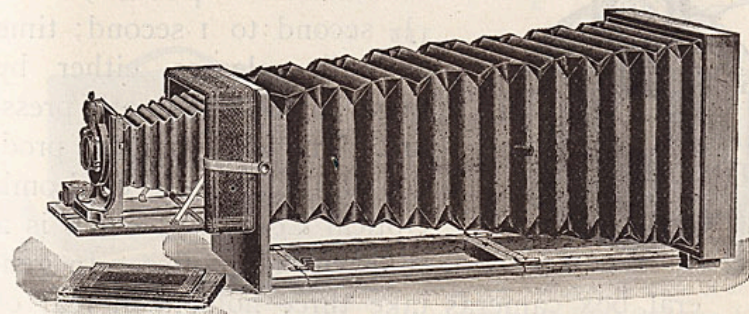
The lens is the fixed focus achromatic.

It is so constructed that when twelve exposures have been made, or as many as desired, it is only necessary to open the back of the camera and draw out the plates that have been exposed, replacing the back, and continue as before. It is so arranged that any number of plates from one to twelve will work equally as well as though fully loaded. An indicator in plain view at the side of the camera shows the number of plates exposed, as it records each as changed. Twelve holders, or carriers, are included in the price of the camera.

It is made in the 4 x 5 size only.

	PRICE.
Complete,	\$8.00
Extra carriers, . . . . .	.25

Cycle Poco Copying Camera.



Especially designed for use with any of the series of Cycle Pocos. It may be used for enlarging copying, or as a long-focus camera in connection with the Cycle Poco. After the Cycle Poco is attached, the front lens may be removed, using the back combination only, which will double the size of the image. The illustration shows method of attaching the two cameras.

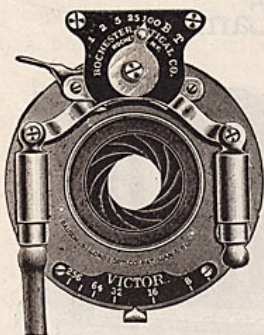
The enlarging camera may be used as a view camera by fitting a lens board and lens into the front, for pictures up to 8 x 10 size. Two sizes only, 6 1/2 x 8 1/2 and 8 x 10, are made. The front of the 8 x 10 holds a 5 x 7 Cycle Poco and 4 x 5 with adapter. 6 1/2 x 8 1/2 takes only 4 x 5 Cycle Poco.

	PRICE.	6 1/2 x 8 1/2	8 x 10
Complete, with one plate holder,	\$12.00	\$14.00	
Adapters, . . . . .		.50	
Double dry plate holders,	1.25	1.50	
Lens boards, . . . . .	.50	.50	

Premo Cameras.

These cameras have an established reputation, and cover in their different models all the requirements of the amateur and professional. They are made in two general styles, one carrying the plate holders in the back of the camera; the others, known as Pony Premos, have cases which carry the camera in one compartment and the plate holders or roll holder in the other. All cameras are made of mahogany, finely polished, and trimmed with lacquered brass. The covering is of fine grain leather, and all metal parts are concealed when camera is closed.

The feature of the 1899 model is the new Victor shutter, which combines instantaneous exposures, from $\frac{1}{100}$ second to 1 second; time or bulb releases, either by finger or by pneumatic pressure. The lenses are the product of the Bausch & Lomb Optical Company, which is a sufficient guarantee. In general, box cameras take three holders in rear of ground glass; Pony Premos, 4 x 5, take four holders or roll holder in case; 5 x 7 size, three holders or roll holder. The roll holders that fit all Premos are the Eastman cartridge roll holders, loading with film in broad daylight.



The Premo, Sr.

The Premo, Sr., combines all the essential features necessary for either hand or tripod work, in the most compact form.

The Premo, Sr., has double swing back, double sliding front, and rack and pinion for focusing.

We make the bed in two sections, hinged together, when desired for use with extremely wide angle lenses. Ordinary wide angle lenses do not need it.

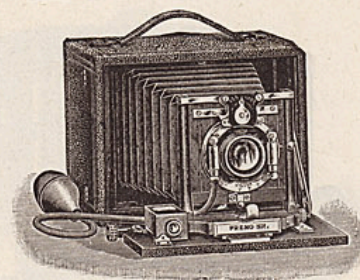
The lens is the Victor Rapid Rectilinear.

The new Victor Shutter, with Iris Diaphragm, is furnished with the Premo, Sr. It works between the lenses without noise or jar.

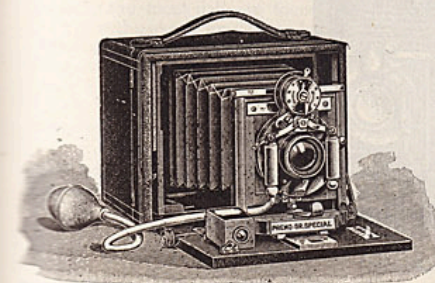
The size of the 4 x 5 Premo, Sr., when closed, is only $5\frac{1}{2} \times 4\frac{1}{2} \times 7$ inches, including space for three holders, or roll holder; and it weighs but $2\frac{1}{2}$ pounds.

The price includes the camera, lens, shutter, and one double plate holder.

	PRICE.	3½ x 4½	4 x 5	5 x 7	6½ x 8½	8 x 10
Premo, Sr.,	\$30.00	\$30.00	\$40.00	\$50.00	\$60.00	\$60.00
Premo, Sr., with diaphragm shutter,	37.00	37.00	48.00	59.00	69.00	
Wide angle lens, extra,	—	10.00	12.00	15.00	18.00	
Hinged bed, extra,	—	3.00	3.00	3.50	4.00	
Extra plate holders,	1.00	1.00	1.25	1.60	2.00	
Cut film holders,	1.35	1.35	1.60	1.85	2.30	
Cartridge roll holder, empty,	5.00	5.00	6.50	—	—	
Light proof film cartridge, . . . . .	.70	.90	1.60	—	—	
Leather-covered case,	2.50	2.50	3.00	3.50	4.00	
Sole leather case,	3.50	3.50	4.00	4.50	5.00	



The Premo, Sr., Special.



The description of the Premo, Sr., excepting lens and shutter, will apply equally well to the Premo, Sr., Special.

The merits of the Zeiss Anastigmat Lens, Series IIa., fitted with the Bausch & Lomb Diaphragm Shutter, as furnished with this camera, are well and favorably known among both amateur and professional photographers the world over. The Series IIa., Zeiss lens embraces an angle of about 80° . It yields an absolutely flat image, free from

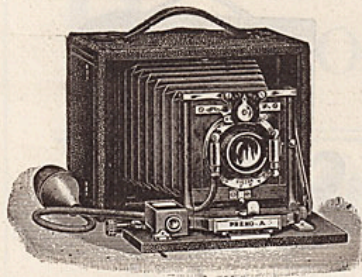
astigmatism, sharply defined to the extreme edges of the plate; and the speed is such as to particularly commend it for hand camera use.

The price includes camera, Zeiss Lens, Series IIa., diaphragm shutter, and one plate holder.

	PRICES.	4 x 5	5 x 7	6½ x 8½	8 x 10
Premo, Sr., Special,	\$67.00*	\$84.00	\$103.00	\$120.00	
Extra plate holders,	1.00	1.25	1.60	2.00	
Cut film holder,	1.35	1.60	1.85	2.30	
Cartridge roll holder, empty,	5.00	6.50	—	—	
Light proof film cartridges, . . . . .	.90	1.60	—	—	
Leather-covered case,	2.50	3.00	3.50	4.00	
Sole leather case,	3.50	4.00	4.50	5.00	
Special W. A. lens,	15.00	17.00	20.00	25.00	

*Fitted with the No. 2 Lens.

The Premo A.



Premo A is fitted with central swing back, and a fine rack and pinion movement for focusing.

The lens is the Victor Rapid Rectilinear, adapted for general work, and made especially for use with the Premo. This lens may be removed from the shutter, and the Victor Wide Angle substituted when desired, as the cells of both are interchangeable.

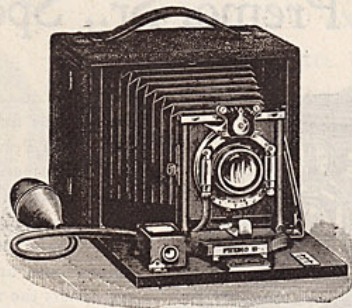
The new Victor Shutter has both finger and pneumatic release, and is fitted with Iris Diaphragm.

The ground glass screen is spring-actuated. Glass plates, cut and roll films, may all be used. The plate holder is the Perfection, Jr., with rubber slides.

The price includes camera, lens, shutter, and one double plate holder.

PRICE.	3½ x 4½	4 x 5	5 x 7	6½ x 8½
Premo A,	\$25.00	\$25.00	\$33.00	\$42.00
Premo A, with diaphragm shutter,	32.00	32.00	41.00	51.00
Wide angle lens, extra,	—	10.00	12.00	15.00
Extra plate holders,	1.00	1.00	1.25	1.60
Cut film holder,	1.35	1.35	1.60	1.85
Cartridge roll holder, empty,	5.00	5.00	6.50	—
Light proof film cartridge, . . . . .	.70	.90	1.60	—
Leather-covered case,	2.50	2.50	3.00	3.50
Sole leather case,	3.50	3.50	4.00	4.50

The Premo B.



Premo B is similar in general design to style A.

Premo B is furnished with the Victor shutter, having Iris diaphragm and pneumatic release. Either single achromatic or the Victor rapid rectilinear lens is fitted, as may be preferred.

The rapid rectilinear lens is precisely the same as furnished with Premo A.

Price includes camera, lens, shutter, and one double plate holder.

PRICES.	4 x 5	5 x 7
Premo B, with achromatic lens,	\$15.00	\$23.00
With Victor rapid rectilinear lens,	20.00	30.00
Wide angle lens, extra,	10.00	12.00
Extra Premo plate holders,	1.00	1.25
Cut film holder,	1.35	1.60
Cartridge roll holder, empty,	5.00	6.50
Light proof film cartridge, . . . . .	.90	1.60
Leather-covered case,	2.50	3.00
Sole leather case,	3.50	4.00

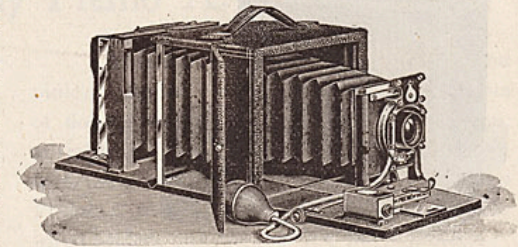
LONG FOCUS PREMO.

When not fully extended the Long Focus Premo is similar in appearance to the Premo, Sr.

Though but a trifle larger than the Senior, the Long Focus Premo has nearly double the focal capacity.

The extra length of draw is obtained by the addition of a folding back.

The Long Focus Premo has double swing back, double sliding front, and a fine rack and pinion movement for focusing. Both the horizontal and vertical swings are at the centre of the plate.



Focal Capacity or Length of Bellows.

4 x 5. 15 inches.	5 x 7. 19 inches.	6½ x 8½. 22 inches.	8 x 10. 28 inches.
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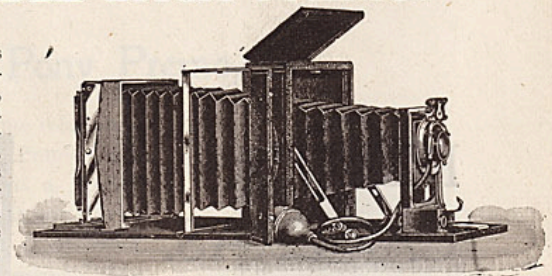
The price includes the camera, lens, shutter, and one double plate holder.

PRICES.	4 x 5.	5 x 7	6½ x 8½	8 x 10
Long Focus Premo,	\$35.00	\$45.00	\$55.00	\$65.00
Long Focus Premo, with Zeiss convertible anastigmat, Series VII. ^a diaphragm shutter,	No. 3 99.00	No. 8 123.00	No. 12 173.00	No. 14 190.00
Wide angle lens, extra,	10.00	12.00	15.00	18.00
Hinged bed, extra,	3.00	3.00	3.50	4.00
Extra plate holders,	1.00	1.25	1.60	2.00
Cut film holder,	1.35	1.60	1.85	2.30
Cartridge roll holder, empty,	5.00	6.50	—	—
Light proof film cartridges, . . . . .	.90	1.60	—	—
Leather-covered case,	2.50	3.00	3.50	4.00
Sole leather case,	3.50	4.00	4.50	5.00

REVERSIBLE BACK PREMO.

The Reversible Back Premo is provided with all modern improvements. It has double swing back, both rising and sliding front and a fine rack and pinion movement, permitting the most delicate focusing.

For the use of long focus lenses for copying, enlarging, and all other purposes requiring an extended length of bellows, the Reversible Back Premo is particularly well adapted.



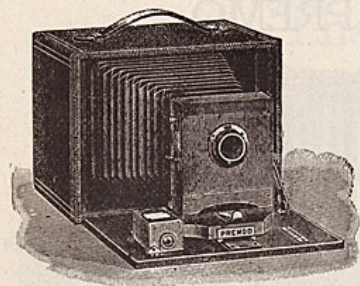
Combining the desirable features of both hand and view camera, the Reversible Back Premo will appeal to and be fully appreciated by a very large class of both amateur and professional photographers.

Focal Capacity or Length of Bellows.

4 x 5. 17½ inches.	5 x 7. 23 inches.	6½ x 8½. 29 inches.	8 x 10. 33½ inches.
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The price includes the camera, lens, shutter, and one double plate holder.

PRICES.	4 x 5	5 x 7	6½ x 8½	8 x 10
Reversible Back Premo,	\$40.00	\$50.00	\$62.00	\$72.00
Reversible Back Premo, Zeiss convertible anastigmat lens, Series VII. ^a , diaphragm shutter,	No. 3 104.00	No. 8 128.00	No. 12 180.00	No. 14 197.00
Wide angle lens, extra,	10.00	12.00	15.00	18.00
Hinged bed, extra,	3.00	3.00	3.50	4.00
Extra plate holders,	1.00	1.25	1.60	2.00
Cut film holder,	1.35	1.60	1.85	2.30
Cartridge roll holder, empty,	5.00	6.50	—	—
Light proof film cartridges, . . . . .	.90	1.60	—	—
Leather-covered case,	2.50	3.00	3.50	4.00
Sole leather case,	3.50	4.00	4.50	5.00



THE PREMO D.

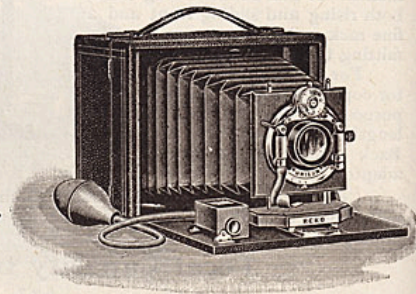
Premo D is similar in appearance to style C, though made without the swing back. Premo D has sliding front for adjusting sky and foreground, and is fitted with single achromatic or rapid rectilinear lens with rotating diaphragm. Our new safety shutter is also supplied, being a neat and effective device for both time and instantaneous work. The shutter is set by a lever at the side, the leaves remaining stationary.

Price includes camera, lens, shutter, and one double plate holder.

PRICES.	4 x 5	5 x 7
Premo D, with achromatic lens,	\$10.00	\$18.00
With rapid rectilinear lens,	15.00	24.00
Extra Premo plate holders,	1.00	1.25
Cut film holder,	1.35	1.60
Cartridge roll holder, empty,	5.00	6.50
Light proof film cartridge, . . . . .	.90	1.60
Leather-covered case,	2.50	3.00
Sole leather case,	3.50	4.00

REKO CAMERAS.

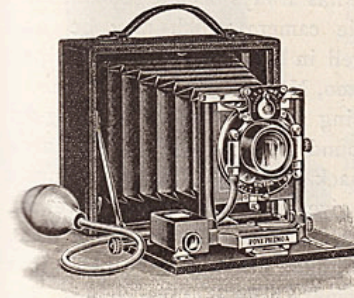
Made by the Rochester Optical Company,
Makers of the Premo Cameras.



These cameras have a special Reko rapid rectilinear lens and a Unicum shutter, with varying speeds, and hand or bulb release. The camera is adapted to either plates or film, has a central swing, rising front, and holds three Premo holders. It is neatly finished in mahogany, like the other Premos, and covered with fine grain leather.

Price, \$15.00

Pony Premo A.



This compact camera has a rack and pinion, together with additional adjustments of double sliding front and rack and pinion, permitting the most delicate focussing. Even with these additional features, the 4 x 5 Pony Premo A measures only 5 1/8 x 6 1/4 x 2 1/8 inches when folded, and weighs only thirty ounces.

Each camera has a rapid rectilinear lens, with the new Premo shutter. This has iris diaphragms, and time, bulb, and instantaneous exposures, either by finger or by pneumatic pressure. The camera is furnished

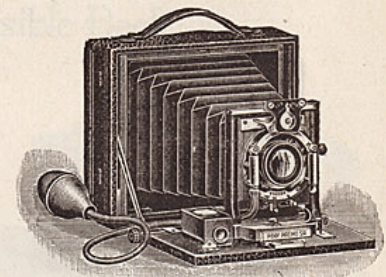
in a neat black case, which will hold the camera and three plate holders.

	PRICE.	4 x 5.	5 x 7.
Pony Premo A,		\$22.00	\$32.00
Wide angle lens, extra,		10.00	12.00
Extra plate holders,		1.00	1.25
Cut film holder,		1.35	1.60
Cartridge roll holder, empty,		5.00	6.50
Light-proof film cartridges, . . . . .		.90	1.60

The Pony Premo, Sr.

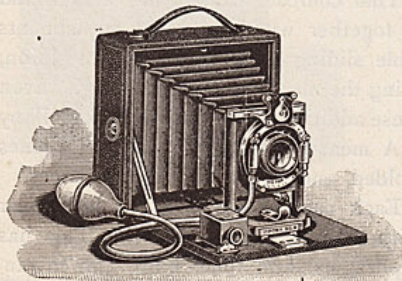
This model bears the same relation to the preceding camera as the Premo, Sr., holds to the Premo A. It has a double swing back, protected from injury by a wooden shield, double sliding front, rack and pinion movement for focussing, thus adapting it to all classes of hand and tripod work.

The lens is the Victor rapid rectilinear, and it is fitted with the new and improved Victor shutter. There is a neat black leather carrying case, specially adapted for bicycle use, which will hold camera and three holders, or cartridge roll holder, carrying cartridge films.



	PRICE.			
	3 1/2 x 4 1/2.	4 x 5.	5 x 7.	6 1/2 x 8 1/2.
Pony Premo, Sr.,	\$28.00	\$28.00	\$38.00	\$48.00
Wide angle lens, extra,	—	10.00	12.00	15.00
Extra plate holders,	1.00	1.00	1.25	1.60
Cut film holder,	1.35	1.35	1.60	1.85
Cartridge roll holder, empty,	5.00	5.00	6.50	—
Light-proof film cartridges, . . . . .	.75	.90	1.60	—

Pony Premo, No. 4.

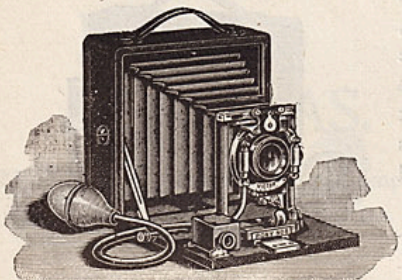


There has always been a demand for a serviceable camera which may be used equally well in the hand or on the tripod. Pony Premo, No. 4, is such a camera. It has a rising and falling front, spring-actuated ground glass, swing back, and a reversing back, which may be easily turned so as to give either horizontal or vertical photographs at will. The lens is the Victor rapid rectilinear, fitted with the new Victor

shutter. Measurements are $2\frac{3}{8} \times 5\frac{7}{8} \times 5\frac{7}{8}$, and weight a little over two pounds. The camera is made of mahogany, neatly covered with seal grain leather. Carrying case, of black sole leather, with neat and serviceable catch, is furnished with each outfit.

PRICE.	4 x 5.	5 x 7.
Pony Premo, No. 4, with achromatic lens,	\$15.00	\$23.00
Pony Premo, No. 4, with Victor rapid rectilinear lens,	20.00	30.00
Wide angle lens, extra,	10.00	12.00
Extra Premo plate holders,	1.00	1.25
Cut film holders,	1.35	1.60
Cartridge roll holder, not loaded,	5.00	6.50
Light-proof film cartridges, 12 exposures,	.90	1.60

Pony Premo, No. 5.

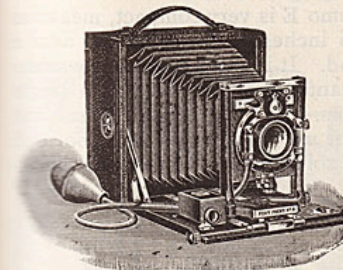


This resembles the No. 5 model, but is more complete and convenient. A rack and pinion for fine focussing is added. It has rising and falling front, swing back, which may be securely clamped in place, and is fitted with Victor rapid rectilinear lens, with the new and improved Victor shutter. Each camera is made of the best mahogany, with fine leather covering and lacquered brass

trimmings. A fine black sole leather carrying case with a safety catch is furnished with each camera, and will hold camera and three extra holders, or roll holder, loading in daylight.

PRICE.	4 x 5.	5 x 7.	6½ x 8½.
Pony Premo, No. 5, R. R. lens, Victor shutter, case, and plate holder,	\$25.00	\$35.00	\$45.00
Wide angle lens, extra,	10.00	12.00	15.00
Extra plate holders,	1.00	1.25	1.60
Cut film holders,	1.35	1.60	1.85
Cartridge roll holder, not loaded,	5.00	6.50	—
Light-proof cartridge, 12 exposures,	.90	1.60	—

Pony Premo, No. 6.



This model is designed with the idea of extreme compactness. It differs from the regular long focus, reversible back in that the compartment for plate holders is omitted and in having all the bellows extension in the front. The front is moved by means of a rack and pinion, which operates on the extension bed, and gives a focal capacity of 15 inches. The regular equipment is the new Victor shutter, with iris diaphragms, and the Victor rapid rectilinear lens. This lens is composed of two combinations, both symmetrical, and may therefore be used either as a double lens or a single achromatic lens.

The single combination will be found excellent for the purpose of photographing distant views, such as mountain scenery,—in fact, any objects at long range.

Focal Capacity, or Length of Bellows.

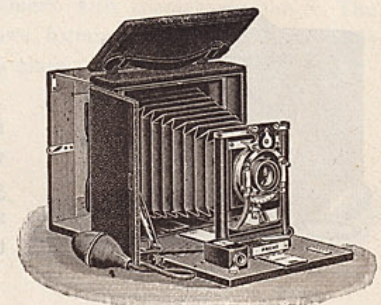
4 x 5. 15 in.	5 x 7. 19 in.	6½ x 8½. 22 in.
The price includes camera, lens, shutter, one double plate holder, and sole leather carrying case.		

	PRICE.		
	4 x 5.	5 x 7.	6½ x 8½.
Pony Premo, No. 6,	\$30.00	\$40.00	\$50.00
Wide angle lens, extra,	10.00	12.00	15.00
Extra plate holders,	1.00	1.25	1.60
Cut film holder,	1.35	1.60	1.85
Cartridge roll holder, empty,	5.00	6.50	*12.00
Light proof roll of film, 12 exposures,	.90	1.60	{ 24 exp., 4.00
			{ 48 exp., 8.00

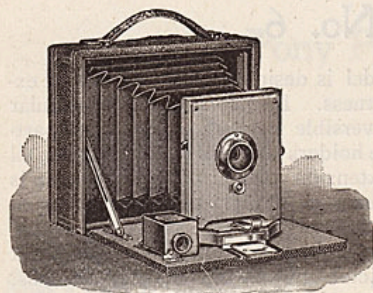
* Not made for cartridge film.

Premo, Sr., Reversible Back.

This camera differs from the ordinary Senior model in having an extra door on the top to allow the manipulation of a reversible back. It has a double swing, operating at the centres, and rising and sliding front. A rack and pinion is supplied for fine focussing. The lens is the Victor rapid rectilinear, specially adapted to hand camera work. The shutter is the new Victor, with instantaneous, bulb and time exposures. The 4 x 5 size is $5\frac{1}{2} \times 7 \times 7\frac{1}{2}$, and weighs 2½ pounds.



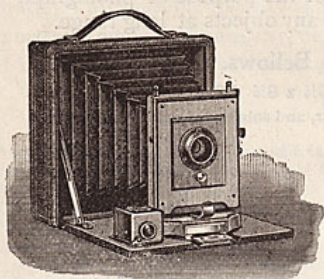
PRICE.	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Reversible back Premo, Sr., lens, shutter, one plate holder,	\$35.00	\$45.00	\$55.00	\$65.00
Wide angle lens, extra,	10.00	12.00	15.00	18.00
Hinged bed, extra,	2.00	3.00	3.50	4.00
Extra plate holders,	1.00	1.25	1.60	2.00
Cut film holders,	1.35	1.60	1.85	2.30
Cartridge roll holder, not loaded,	5.00	6.50	—	—
Light-proof film cartridge,	.90	1.60	—	—
Leather covered case,	2.50	3.00	3.50	4.00
Sole leather case,	3.50	4.00	4.50	5.00



Pony Premo E.

Pony Premo E is very compact, measures but 2 x 5 1/4 x 6 inches, and weighs but a trifle over one pound. It is fitted with a new safety time and instantaneous shutter and a single achromatic lens. It has ground glass and screw plate for use on tripod. May be used with cartridge roll holder, using daylight loading films.

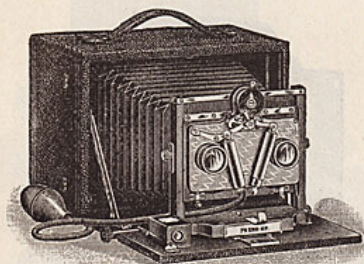
Pony Premo E, case, and plate holder,	PRICE.	\$8 00
Extra plate holders,		1.00
Cut film holders,		1.35
Cartridge roll holder, daylight loading,		5.00



Pony Premo, No. 2.

This design has reversible back and solid sliding front and shutter combined. The shutter is a new safety device, set by a milled head on the side, and gives both time and instantaneous exposures. Weight is but a trifle over two pounds; and it measures, closed, 2 1/4 x 5 1/2 x 5 1/2 inches. Either glass plates, cut or cartridge films, may be used.

Pony Premo, No. 2, with achromatic lens, case, and plate holders,	PRICE.	4 x 5	\$10 00
With rapid rectilinear lens,			15.00
Extra plate holders,			1.00
Cut film holder,			1.35
Cartridge roll holder, not loaded,			5.00
Light proof film cartridge, 12 exposures,			.90

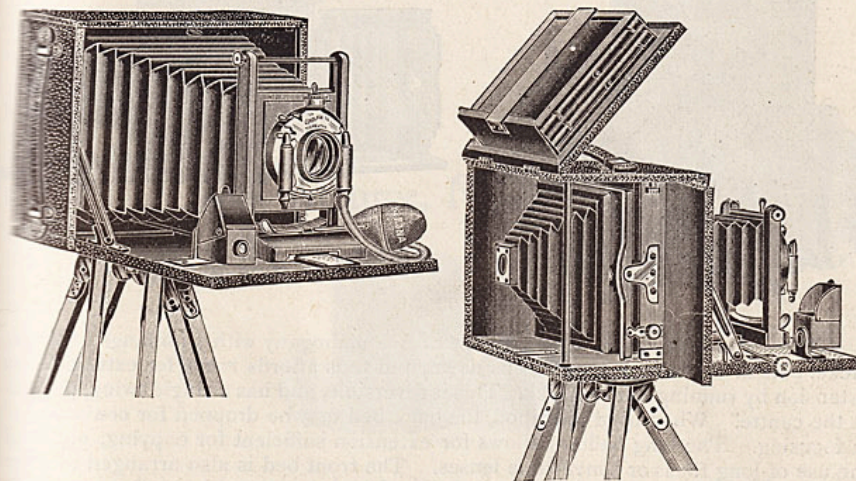


Stereo Premo.

The regular Premo A, Premo Sr., or long focus Premo may be supplied with an extra wide front for stereoscopic photography in 5 x 7 and 6 1/2 x 8 1/2 sizes. The lenses are a matched pair of Victor rapid rectilinear, with the B. & L. stereo shutter.

	PRICE.	5 x 7.	6 1/2 x 8 1/2.
Stereo Premo A,		\$70.00	\$80.00
Stereo Premo, Sr.,		75.00	85.00
Stereo long focus premo,		80.00	90.00
Wide angle lens, extra (each),		12.00	15.00
Hinged bed, extra,		3.00	3.50
Extra Premo holders,		1.25	1.60
Sole leather case,		4.00	4.50

KORONA CAMERAS.



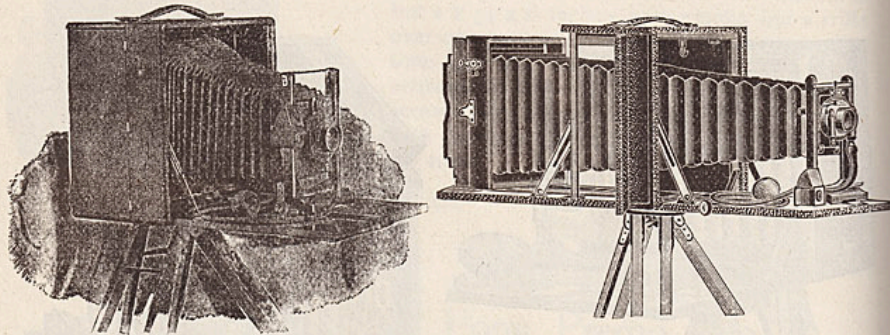
These cameras are made in two styles, the box pattern holding plate holders in the back, and a cycle form with carrying case holding camera and plate holders. The box form is numbered Series I., and the cycle form Series II. They are made of rich, dark mahogany, with nicked trimmings, and are supplied with Korona symmetrical lenses of the Gundlach Optical Co., or fine achromatic lenses, and the new Gundlach shutter. The Series I. and II. have double swing, rack and pinion, etc.; I.a. or II.a, single swing, rack and pinion. I.b, and II.b have no swings or fine focusing attachment, and I.c is a cheaper camera with special shutter. The Korona has an auxiliary detachable back bellows, forming a dark chamber. This is fitted with a lens, which is used as a focusing glass.

PRICE LIST.

	4 x 5.	5 x 7.
Korona I. or II., inst. symmetrical lens,	\$25 00	\$32 00
“ I. or II., Turner-Reich lens,	45.00	57.00
“ I. or II., no lens or shutter,	15.50	20.00
“ I.a or II.a, inst. symmetrical lens,	16.00	23.00
“ I.a or II.a, single achromatic lens,	13.00	20.00
“ I.a or II.a, Turner-Reich lens,	36.00	48.00
“ I.a or II.a, no lens or shutter,	10.00	17.00
“ I.b or II.b, single achromatic lens,	10.00	15.00
“ I.b or II.b, inst. symmetrical lens,	14.00	19.00
“ I.c, single achromatic lens,	7.00	—
Wide angle lenses, extra,	8.00	10.00
Extra for rack and pinion,	2.00	2.00
Double plate holders,	1.00	1.25
Leather covered case,	2.50	3.00
Sole leather case,	3.50	4.00

KORONA CAMERAS.

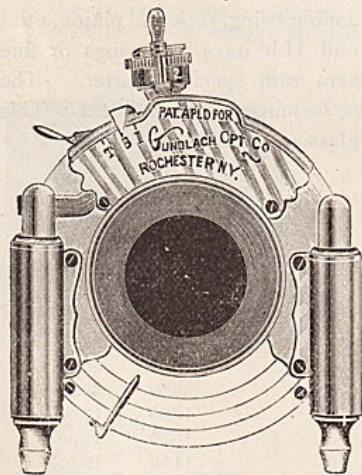
Long Focus. Series VI.



These cameras are very solidly built of fine mahogany with trimmings of brass, nickel-plated. The rear panel drops down, and thus affords room for extra bellows extension by running out the back. This is reversible, and has a single swing, pivoted at the centre. When used on tripod, the back bed may be dropped for convenience in focusing. The long bellows allows for extension sufficient for copying, etc., and the use of long focus or convertible lenses. The front bed is also arranged to drop down so as to clear the field of the lens, when extreme wide angles are used. When this is done, the back focus is used alone.

The rack and pinion is furnished with an extra large head, which may be turned upright, by means of a joint in the spindle, so as to allow the box to close. The rack is diagonal, on the microscope principle, to avoid play.

The lens is the Korona Rectigraphic, a rapid rectilinear, unsymmetrical, the combinations of which may be used separately. Comparing the double combination, the back lens alone, or the front lens, we obtain images varying in size in the proportion of 2 to 3 to 4. When using the single lenses alone, they should be screwed into the back of the shutter, and the hood screwed into the front.



It has the new Gundlach Optical Co. shutter, giving varying instantaneous exposures, $\frac{1}{100}$ second down to one second, time or bulb exposures. This may be operated either by pneumatic or finger release.

The camera holds three holders in 4 x 5 size, with a patent plate holder carrier holding two, for protecting plate holders from strong light when laid aside for focusing.

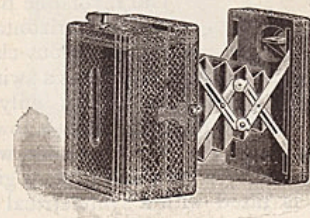
If desired, this camera may be fitted with a Turner-Reich anastigmat, the front lens of about twice the focus of the rear one.

	4 x 5.	5 x 7.	6½ x 8½.	8 x 10.
Korona, L. F., VI, camera, with rectigraphic lens,	\$40.00	\$50.00	\$65.00	\$80.00
Korona, L. F., VI, camera, with Turner-Reich Anastigmat,	60.00	85.00	120.00	150.00
Korona, L. F., VI, camera, no lens, etc.,	30.00	40.00	50.00	60.00
Extra plate holders,	1.00	1.25	1.60	2.00
Leather case,	3.50	4.00	4.50	5.00

MONROE CAMERAS.

No. 1.	3¼ x 4¼,	\$5.00
" 1.	4 x 5,	6.00
" 2.	2½ x 3½,	5.00
" 2.	3¼ x 4¼,	6.00
" 2 A.	3¼ x 4¼,	10.00
" 3.	3¼ x 4¼,	8.00
" 4 A.	4 x 5,	7.00
" 4 B.	4 x 5,	8.00
" 4 C.	4 x 5,	10.00
" 4 D.	4 x 5,	12.00
" 4, Sr.	4 x 5,	14.00

Monroe, No. 2 A.

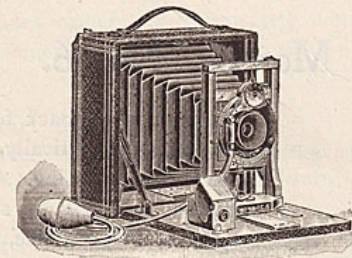


A camera using 3¼ x 4¼ cartridge film, loading in daylight. The camera measures, when closed, 3 x 4¼ x 5½ inches, and by an ingenious folding device the camera may be extended to its proper position. The back is an Eastman 3¼ x 4¼ vertical roll holder, taking 4¼-inch films.

It has a fine single achromatic lens, in universal focus.

	PRICE.
Monroe 2A camera, 3¼ x 4¼,	\$10.00
Film cartridges, 4¼ x 3¼, for cartridge roll holder, . . . . .	.70
Plate backs,	1.00
Plate holders, . . . . .	.75

Monroe, No. 5.



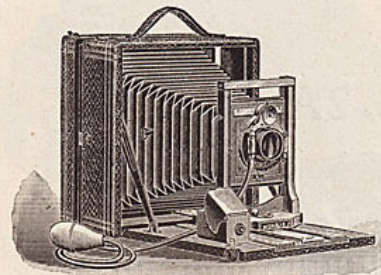
Made of mahogany, leather covered. Has a reversible back, a regular Leica & Lomb Umicum shutter, with finger or pneumatic releases, and a high-grade rapid rectilinear lens. Is of the compact cycle form, and may be furnished with a sole leather carrying case, holding camera and extra holders, or a cartridge roll holder.

	4 x 5.	5 x 7.	6½ x 8½.
No. 5 Monroe camera, lens, shutter, plate holder, and sole leather case,	\$16.00	\$24.00	\$35.00
No. 5 Special (has achromatic lens),	12.00		
Double dry plate holders,	1.00	1.25	1.50
Sole leather carrying case,	3.00	4.00	5.00

MONROE CAMERAS.

Monroe, No. 7.

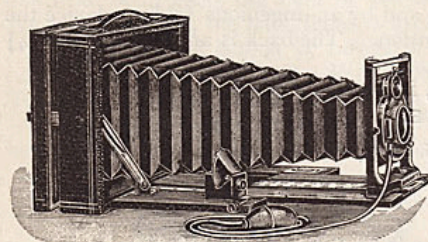
Long Focus. Reversible Back.



This camera is constructed of rich, dark mahogany, covered with fine grain leather. The fittings are of polished and lacquered brass, and the extension bed is very strong and rigid.

The reversible back enables one to photograph both horizontal and vertical positions of an object without changing the camera on its tripod. It has a swing back, pivoted centrally. This operates only when two buttons are pressed, which allow the back to recede, and give room for the swing back to operate. It has finder, with shade and rising front.

The front may be drawn out by a rack and pinion, giving an extra bellows extension for copying, etc. It is fitted with a symmetrical rapid rectilinear lens and a B. & L. Unicum shutter.

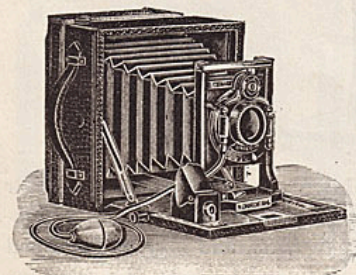


PRICE.

4 x 5. 5 x 7. 6 1/2 x 8 1/2.

No. 7 long focus Monroe, complete, with lens, Unicum shutter, plate holder and sole leather case, . . .	\$30.00	\$37.00	\$50.00
Double dry plate holders, . . .	1.00	1.25	1.50

Monroe, No. 6.

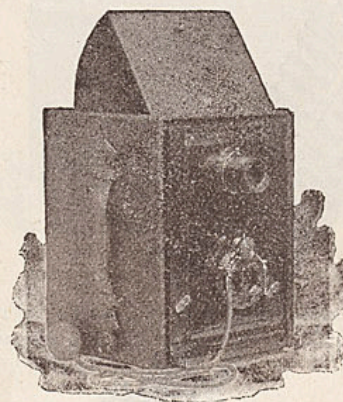


Has reversing back, for taking pictures either horizontally or vertically, and a rack and pinion for accurate focussing. The swing back is easily adjusted, and may be securely clamped in any position. In 4 x 5 size, a special camera, No. 6. Senior, carrying holders in the rear of the box, and without swing or reversible backs, may be obtained in place of the regular model. Lens is a Bausch symmetrical in a Unicum shutter.

PRICE.

	4 x 5.	5 x 7.	6 1/2 x 8 1/2.
No. 6 Monroe camera, lens, shutter, plate holder, and carrying case, . . .	\$22.00	\$30.00	\$42.00
No. 6 Monroe, Sr., camera, lens, shutter, plate holder, and carrying case, . . .	18.00		
Double dry plate holders, . . .	1.00	1.25	1.50

The Twin Lens Montauk.



In the Twin Lens Montauk that only possible objection to instantaneous photography, the uncertainty of getting the subject exactly as it is wanted, is entirely removed, as the picture to be made is actually visible at the moment of taking it.

The Twin Lens Montauk is fitted with two accurately matched lenses, arranged one above the other, the lower one to photograph the picture, the upper one to reflect an exact duplicate upon a full-size ground glass at the top of the camera, and to afford a full view of the picture as it will appear on the plate. The result is obvious: no matter how fleet an object, the motion can be carefully followed and the picture made at the proper moment. No plates ruined, no waste of materials, and only perfect results.

The price includes camera, two accurately matched lenses (one with shutter), and a Detective holder.

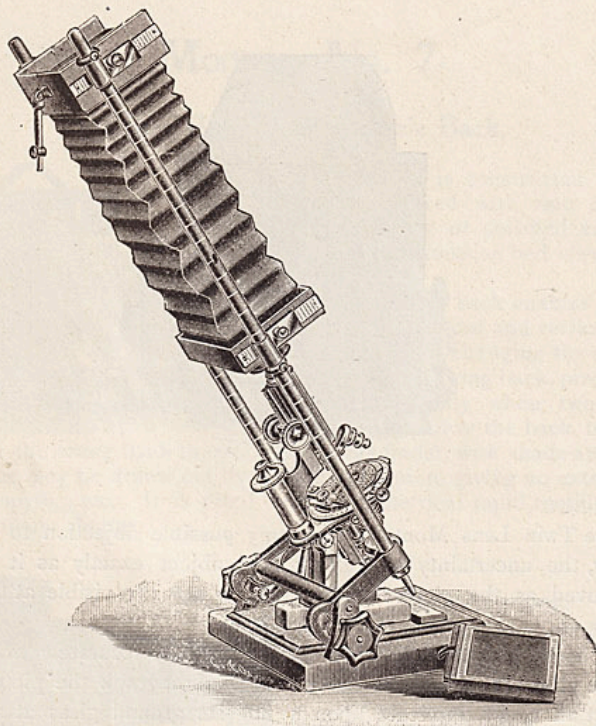
PRICE LIST.

Twin Lens camera for pictures 4 x 5, rapid symmetrical lenses, . . .	\$65.00
Twin Lens camera, 5 x 7, with rapid symmetrical lenses, . . .	80.00

The very finest results with the Twin Lens Montauk are obtained when employing high-grade lenses. We offer two styles, our "Gray Day" Twin Lens Montauks, both of which we guarantee to be of the very highest efficiency.

4 x 5 Twin Lens Montauk, fitted with set of Collinears, II. No. 3, . . .	\$140.00
4 x 5 " " " " " " " " III. No. 3, . . .	130.00
5 x 7 " " " " " " " " II. No. 4, . . .	185.00
5 x 7 " " " " " " " " III. No. 3a, . . .	165.00

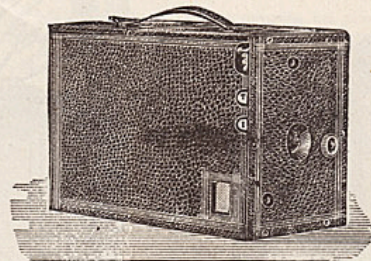
B. & L. Photomicrographic Camera.



This camera is constructed, as such cameras should be, with a heavy iron base to insure rigidity. The base is planed to a true level, and is provided with an adjustable clamp, against which the microscope is placed. There are two standards upon which the camera body proper slides. These are so arranged that the microscope may project its image into the camera either vertically, horizontally or obliquely. These bars are made of steel, 2½ cm. in diameter and 1 meter in length, and the camera is locked in position on these by means of milled head clamps. The lower right and left milled head clamps rigidly support the lower part of the camera, overcoming entirely any undue action on the fine adjustment, as the microscope is entirely free from the weight of the camera. The ground glass can be brought exactly at right angles to the optic axis by means of graduations on the vertical bars. The graduations will further assist in computing magnifications. The bars are 25 cm. apart, giving sufficient space for the head when adjusting an object to the microscope. The bellows is 50½ cm. long, mounted in polished mahogany, and is connected to the microscope by means of a light-tight, double metal chamber, blackened inside and out to prevent reflection. This effectually prevents the entrance of stray rays of light. In making this connection with the chamber, the camera does not come in contact with the microscope tube. Size of plates, 4 x 5 or 3¼ x 4¼.

Price, without microscope, with one double dry plate holder, 4 x 5, and kits for 3½ x 4½ plates,	\$40.00
Extra holders,	1.00
Extra kits, . . . . .	.20

GEM POCO CAMERAS.



4 x 5.

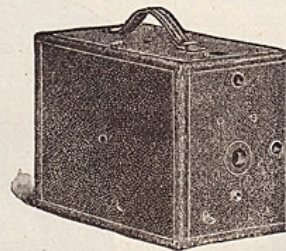
Size, 4 x 5. Has fixed focus lens, time and instantaneous Rochester shutter, and two brilliant view finders. Covered with fine morocco grain leather, has leather handle and two tripod plates. Capacity is three holders.

	PRICE.	4 x 5.
Camera, complete, with one dry plate holder,		\$5.00
Double dry plate holders, . . . . .		.75
Gem leather carrying case with shoulder strap,		1.40
Size,		5½ x 6¾ x 8
Weight,		1½ lbs.



PREMO VEE CAMERAS.

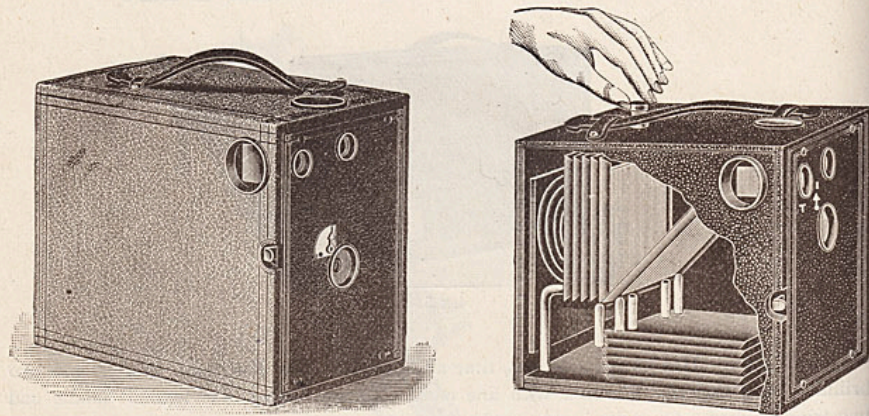
FORMERLY PREMO V.



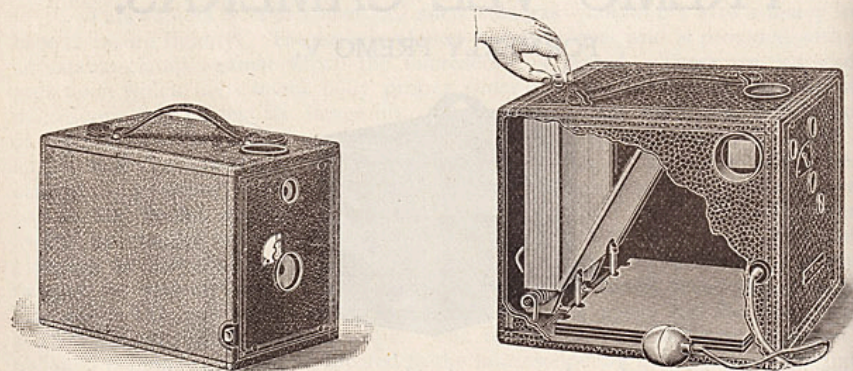
This camera is carefully made, is covered with morocco grain leather, has two brilliant view finders, will hold three Perfection dry plate holders, has new safety shutter. Made in 3½ x 4½ and 4 x 5 sizes.

	PRICE.	3½ x 4½ or 4 x 5
Premo V, single achromatic lens, and one dry plate holder,		\$5.00
Perfection dry plate holders, each,		1.00
Premo V leather carrying case and straps,		1.25
Developing and printing outfit,		1.50

Cyclone Magazine Cameras.



These cameras differ from the ordinary, in that they take a whole dozen plates at one loading, in plate holders that are included in the original cost of the cameras. After loading these plates in the dark-room, it is not necessary to open the camera, as the plates are changed instantly by means of a lever on the outside. The shutters are self-setting, and therefore the operator may take several pictures in rapid succession, if necessary. There is no focussing required, the lens being of universal focus, with great depth and definition. To avoid confusion, an automatic register has been added, which shows instantly how many unexposed plates are still available in the magazine. In the Number Four and Five series, aluminum plate holders are substituted for the iron ones, in order to lessen the weight. These cameras are fitted with set of diaphragms, and a bulb shutter so as to avoid jarring during the exposure, and are covered with fine grain morocco leather.



Price Lists.

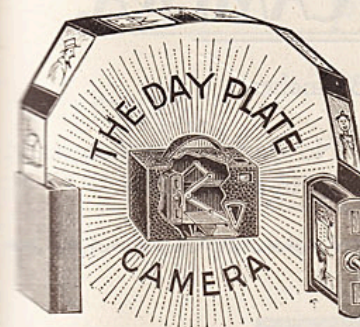
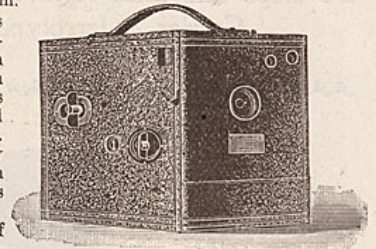
Magazine Cyclone No.	Size.	Dimensions.	Price.
1,	2 1/4 x 2 1/4,	3 x 5 1/4 x 5 1/4,	\$3.50
" " " 2,	2 1/4 x 4 1/4,	5 x 6 1/4 x 7 1/4,	6.00
" " " 3,	4 x 5,	5 1/4 x 7 x 8,	8.00
" " " 4,	2 1/4 x 4 1/4,	5 x 6 1/4 x 7 1/4,	8.00
" " " 5,	4 x 5,	5 1/4 x 7 x 8	12.00

The Day Plate Camera.

3 1/2 x 4 1/2.

In this camera no plate holders are required. The loading is in broad daylight, and this permits the use of an unlimited number of plates without being dependent on a dark room.

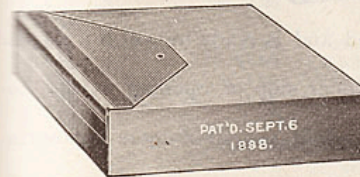
The lens is a single achromatic, which is always in focus, and cuts sharply all over the plate. It has a new shutter, which



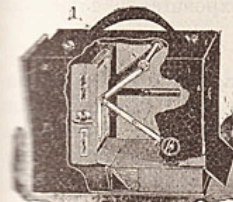
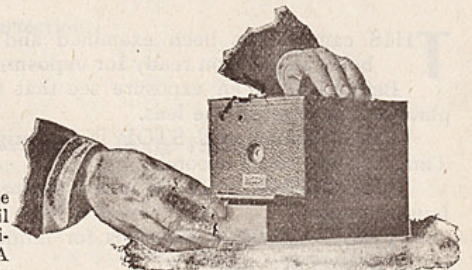
is self-setting, and an automatic register, which records each exposure.

The plates are mounted in the factory on a strip of black paper, and are packed in a pasteboard box with a narrow opening. The box is sealed, with the end of the strip projecting.

The box is placed in the camera in the following manner: the strip projecting from the plate



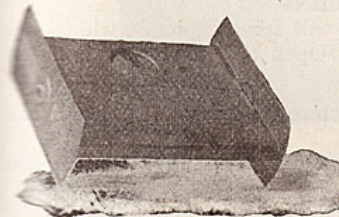
Box is hooked to the reel in the camera; and the key at the left, engaging the reel, is turned until the register indicates "1."



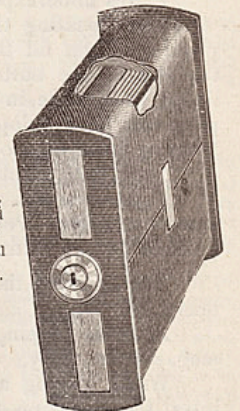
A plate has thus been drawn from the box, and is ready for exposure.

The key at the right focusses each plate as it is ready for exposure, and holds the reel in position. After all the plates have been exposed, they are securely protected from the light by the blank paper of the end of the strip, which, by a few turns of the key, is wound about the reel containing them. The reel (shown in the accompanying cut) may then be removed from the camera.

After the plates are developed, the reel is again available. To repeat, the empty plate box is removed from the camera and replaced by a full one and another reel. These reels may be folded and carried in the vest pocket.



Reel folded before assembling.



Reel holding exposed plates after removal from camera.

Two reels are furnished with each camera. This illustration shows the plates as they are mounted on the strip of paper. By tearing the edge of the mat which holds it, each plate may be removed separately for development. A plate adapter, permitting the exposure of one or two plates without the necessity of using a new box, is furnished with each camera, 5 x 6 x 7 1/2 ounces. Two gel sockets.



Reel assembled, ready to put in camera. Size of inches; weight, finders, two tri-

PRICE LIST. Camera, with one extra reel, \$8.00. Plates, per box of ten, 3 1/2 x 4 1/2, \$0.40. Extra reels, \$0.25.

Lens Boards.

For New Model Outfit, all sizes,	\$0.25
" New Model Improved, Peerless, and Standard Cameras, all sizes, . . . . .	.40
" Rochester View, Stereo and King Cameras, . . . . .	.40
" Rochester Favorite and Poco Cameras, . . . . .	.25
" Universal, Carlton, and Ideal, $3\frac{1}{2} \times 4\frac{1}{2}$ to 8×10 , 10×12 and 11×14 , 14×17, . . . . .	.50 .60 .80

HOLDER SLIDES.

In ordering Holder Slides always state for what camera they are wanted.

Size.	Anthony.				Scovill.		R. O. Co.		R. C. Co.		Eastman.
	Press Slides for D. P. Holders.	Rubber Slides for D. P. Holders.	Wood Slides for Renster Holders.	Wood Slides for Novel Holders.	Registering Slides for D. P. Holders.	* Wood Slides for Holders.	Press Board Slides.	Hard Rubber Slides.	Press Board Slides.	Hard Rubber Slides.	
$4\frac{1}{2} \times 4\frac{1}{2}$	\$0.10	\$0.15	—	—	\$0.18	\$0.27	\$0.15	\$0.25	\$0.15	\$0.15	—
4×5	.10	.20	—	—	.20	.32	.15	.25	.15	.15	—
$4\frac{1}{2} \times 5\frac{1}{2}$	—	—	—	—	.24	.34	—	—	—	—	\$0.24
$4\frac{1}{2} \times 6\frac{1}{2}$	.15	.25	—	—	.28	.36	.20	.30	.20	.20	.30
5×7	.15	.30	—	—	.35	.38	.20	.35	.20	.20	.35
5×8	.15	.30	—	—	.40	.40	.20	.35	.25	.20	.35
$6\frac{1}{2} \times 8\frac{1}{2}$	.20	.40	—	—	.55	.45	.25	.45	.25	.50	.40
8×10	.20	.50	\$0.70	—	.75	.72	.30	.50	.30	.60	.50
10×12	.35	1.00	1.25	\$0.75	1.00	1.35	.45	.80	.40	.80	—
11×14	.45	1.30	1.60	1.15	1.30	2.02	—	1.25	.50	1.00	—
14×17	.75	2.25	2.00	1.35	—	2.25	—	2.00	.60	1.20	—
17×20	—	—	2.50	1.60	—	2.70	—	3.00	.75	1.50	—
18×22	—	—	2.75	2.00	—	3.15	—	—	—	—	—
20×24	—	—	3.25	—	—	3.60	—	—	—	—	—
22×27	—	—	3.50	—	—	—	—	—	—	—	—
25×30	—	—	4.00	—	—	5.40	—	—	—	—	—

* Rubber Slides 40 per cent. additional.

KITS OR INSIDE FRAMES.

Any Size Opening.

Outside Measure.	Glass Cor. Anthony.	Rabbeted for Wet or Dry Anthony.	Scovill Glass Cor.	Scovill Rabbeted for Wet or Dry.	R. O. Co. Rabbeted.	R. C. Co. Rabbeted.	Eastman Rabbeted.
4×5	—	\$0.25	\$0.64	\$0.28	\$0.25	\$0.20	—
$4\frac{1}{2} \times 5\frac{1}{2}$	\$0.65	.25	.65	.29	.25	—	\$0.30
$4\frac{1}{2} \times 6\frac{1}{2}$	—	.25	.67	.30	.25	—	.30
5×7	—	.30	.68	.31	.30	.25	.35
5×8	—	.30	.74	.32	.30	.25	.35
$6\frac{1}{2} \times 8\frac{1}{2}$	.75	.30	.84	.34	.35	.30	.35
7×10	—	.30	.90	.40	—	—	—
8×8	—	—	.90	.40	—	—	—
8×10	1.00	.35	.95	.40	.40	.35	.40
10×12	1.10	.55	1.25	.60	.50	.40	—
11×14	1.20	.60	1.30	.66	.60	.50	—
14×17	1.60	.75	1.80	.80	.75	.65	—
17×20	1.80	1.00	1.96	—	1.00	.95	—
18×22	—	1.00	2.30	—	1.50	1.20	—
20×24	2.25	1.25	2.45	—	—	—	—

Lloyd's Reading Glasses



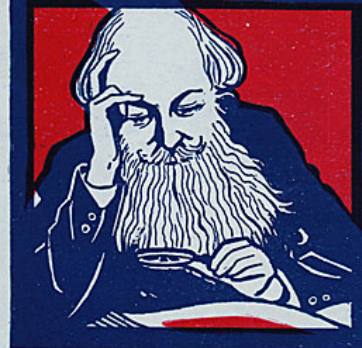
One need not be old to enjoy the nearly invisible beauties in photographs, miniatures, flowers, postage stamps, snowflakes, and the countless miracles of nature which can be revealed by the Reading Glass.

But, when youth has gone, what content they bring to those who can no longer control their natural sight! How pleasurable the daily news becomes, printed never so badly, perhaps!

And how serviceable to the artist, the photographer, and to those who must improve upon the best eyesight that ever was! How easily and rapidly they do their work! How much bread and butter depends upon this!

Reading glasses give pleasure, content, help, rest, to all. Do those who do not use them realize how much good can be obtained at how little cost?

in. diameter,	PRICE.	$3\frac{1}{2}$ in. diameter,	PRICE.
" "	\$0.40	4 " "	\$1.25
" "	.45	4 $\frac{1}{2}$ " "	1.50
" "	.55	5 " "	1.90
" "	.65	5 $\frac{1}{2}$ " "	2.40
" "	.80	6 " "	3.00
" "	.90		3.50
" "	1.05		



Dry Plates.

	Amer- ican.	Climax.	Cramer.	East- man.	Eclipse, Jr.	Ham- mer.	Seed.	Stand- ard.	Stanley.	Wuest- ner.
2 x 2,	\$0.18	\$0.25	\$0.30	\$0.25	\$0.25	\$0.20	\$0.25	\$0.20	\$0.18	\$0.25
2 x 2½,	.25	.25	.30	.25	.25	.25	.25	.25	.25	.25
2½ x 2½,	.25	.25	.30	.30	.25	.30	.30	.25	.25	.25
2½ x 4,	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35
3 x 3,	.35	.35	.40	.35	.35	.35	.35	.35	.35	.35
3 x 3½,	.35	.35	.40	.35	.35	.35	.40	.35	.35	.35
3½ x 3½,	.35	.35	.40	.35	.35	.40	.40	.35	.35	.40
3½ x 3¾,	.40	.35	.40	.35	.35	.40	.40	.35	.35	.35
3½ x 4½,	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45
3¾ x 3¾,	.40	.40	.40	.35	.35	.40	.40	.35	.35	.40
4 x 4,	.60	.60	.60	.60	.55	.60	.60	.60	.60	.50
4 x 5,	.65	.65	.65	.65	.65	.65	.65	.65	.65	.65
4½ x 4½,	.60	.60	.60	.60	.60	.60	.60	.60	.65	.60
4½ x 5½,	.75	.75	.75	.75	.75	.75	.75	.75	.75	.75
4½ x 6½,	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
4¾ x 6½,	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5 x 7,	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
5 x 8,	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
6½ x 8½,	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
7 x 10,	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
8 x 10,	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
10 x 12,	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
11 x 14,	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
14 x 17,	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
16 x 20,	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
17 x 20,	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
18 x 22,	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50
20 x 24,	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50

LLOYD'S

FLASH CARTRIDGES

MAKE CLEAR PICTURES

Dealers
or
Mail 25¢

Andrew J. Lloyd & Co.
323 Washington St.
Boston



Ortho-chromatic and Iso-chromatic Plates.

For correct color values, auburn hair, colored draperies, cloud effects, etc. Best results obtained with Ray filter, which see.

Cramer's iso-chromatic, instantaneous, medium, and slow; Wuestner's ortho-chromatic; Carbutt's ortho-chromatic; Seed's ortho-chromatic. Same list as regular plates.

Process Plates.

For photo-mechanical engraving processes, copies of line drawings, etc. Gives extreme contrast. Carbutt's, Wuestner's, Climax, Seed, Standard, Cramer contrast. Same list as regular plates.

Positive and Negative Films.

	Heavy.	Thin.		Heavy.	Thin.		Heavy.	Thin.
4½ x 4½	\$0.60	\$0.55	5 x 7,	\$1.60	\$1.40	8 x 10,	\$3.45	\$3.00
4 x 5,	.95	.80	5 x 8,	1.80	1.55	10 x 12,	5.45	4.75
3½ x 6½,	1.25	1.10	6½ x 8½,	2.40	2.10	11 x 14,	7.20	6.25
4½ x 6½,	1.40	1.20						

Carbutt's X-ray Plates.

Size.	Price.	Size.	Price.
5 x 7,	\$1.30	11 x 14,	6.00
5 x 8,	1.56	14 x 17,	11.65
6½ x 8½,	2.00	16 x 20,	15.90
8 x 10,	2.90	18 x 22,	21.00
10 x 12,	4.50	20 x 24,	23.40

Non-halation Plates.

Size.	Eastman's, Seed's and New York Non-Halation. Per Doz.	Cramer's Non-Halation. Per Doz.	Hammer Aurora D. C., Non-Halation. Per Doz.	E. I. Non-Halation. Per Doz.	Carbutt's Non-Halation. Per Doz.
3½ x 4½ . . .	\$0.55	\$0.45	\$0.55	\$0.55	\$0.55
4 x 5 . . .	.80	.65	.80	.80	.80
4½ x 5½ . . .	.95	.75	.95	.90	.90
4½ x 6½ . . .	1.10	.90	1.10	1.10	1.10
4½ x 6½ . . .	1.20	1.00	1.20	1.20	1.20
5 x 7 . . .	1.40	1.10	1.40	1.40	1.30
5 x 8 . . .	1.55	1.25	1.55	1.55	1.50
6½ x 8½ . . .	2.10	1.65	2.10	2.10	2.00
7 x 10 . . .	2.65	2.10	2.65	2.70	2.50
8 x 10 . . .	3.00	2.40	3.00	3.00	2.90
10 x 12 . . .	4.75	3.80	4.75	4.75	4.50
11 x 14 . . .	6.25	5.00	6.25	6.25	6.00
14 x 17 . . .	11.25	9.00	11.25	11.25	10.80
16 x 20 . . .	15.65	12.50	15.65	15.75	15.00
17 x 20 . . .	16.25	13.00	16.25	16.25	15.60
18 x 22 . . .	19.40	15.50	19.40	19.25	19.80
20 x 24 . . .	23.15	18.50	23.75	23.50	22.20

Discounts Quoted upon Application.

Lantern Slide Plates.

Carbutt's, Cramer's, Climax, Standard, Wuestner, Seed's,	\$0.55
Eastman, . . . . .	.70
Seed's G. B. P. R. plates, six tones by development alone, . . . . .	.60

Stripping Plates.

Size.	Carbutt's Plain.	Carbutt's Non-Halation.	Seed's.	Cramer's Lightning.	Cramer's Iso.	Wuestner's Regular and Orthochromatic.	Climax.
5 x 7	\$1.45	\$1.55	\$1.50	\$1.45	—	\$1.45	\$1.45
5 x 8	1.65	1.75	1.65	1.65	\$2.00	1.65	1.65
6½ x 8½	2.20	2.35	2.20	2.20	2.65	2.20	2.20
7 x 10	2.80	2.95	2.85	2.80	3.36	2.80	2.80
8 x 10	3.20	3.45	3.20	3.20	3.85	3.20	3.20
10 x 12	5.00	5.40	5.50	5.00	6.00	5.05	5.00
11 x 14	6.60	7.50	6.65	6.65	8.00	6.65	6.60
14 x 17	12.00	12.95	12.00	12.00	14.40	12.00	12.00
16 x 20	16.60	18.00	16.65	16.65	20.00	16.65	16.60
17 x 20	17.30	18.70	17.50	17.50	21.00	17.30	17.30
18 x 22	20.00	23.75	20.00	20.00	24.00	20.00	20.00
20 x 24	24.50	26.60	25.00	25.00	30.00	24.50	24.50

Transparency and Opal Plates.

Per dozen. Also packed in half-dozen packages.

Size.	Cramer Carbutt A	Seed G. G. Trans.	Carbutt G. G. Climax G. G.	Seed G. B. P. R.	Seed G. B. P. R. G. Glass.	Carbutt or Seed Plain Opals.	Carbutt or Seed Ground Opal.
3½ x 4½	\$0.45	\$0.55	\$0.70	\$0.50	\$0.55	\$0.55	\$0.60
4 x 5	.65	.80	1.15	.70	.80	.80	.85
4½ x 6½	.90	1.10	—	1.00	1.10	1.20	1.45
5 x 7	1.10	1.40	1.40	1.25	1.40	1.50	1.80
5 x 8	1.25	1.55	1.60	1.40	1.60	1.70	2.25

Per half-dozen.

4½ x 8½	\$0.85	\$1.05	\$1.15	\$0.90	\$1.05	\$1.20	\$1.45
5 x 10	1.20	1.50	1.65	1.35	1.50	1.75	2.15
6 x 12	1.90	2.40	2.50	2.10	2.40	2.65	3.25
7 x 14	2.50	3.15	3.20	2.75	3.15	3.50	4.20
8 x 17	4.50	5.65	5.50	4.95	5.65	6.00	7.00

Discounts Quoted upon Application.

Light Proof Film Cartridges.

For Pocket Kodaks, Cartridge Kodaks, Bullets, Bull's-eye, and Falcons.

		Price.
12 exposures,	1½ x 2 in. Pocket Kodak,	\$0.25
12 "	2½ x 3½ " No. 1 Folding Pocket Kodak,	.40
12 "	2 x 2½ " No. 1 Falcon,	.40
12 "	3½ x 3½ " No. 2 Bullet, Bull's-eye, Folding B. E., F. P. K., Falcon or Specials,	.60
18 "	3½ x 3½ " " " " " " " " " " " "	.90
12 "	4 x 5 " No. 4 Bullet, No. 4 Bull's-eye or Special, (5 exposures, Panoram),	.90
12 "	5 x 4 " No. 4 Cartridge Kodak,	.90
12 "	7 x 5 " No. 5 Cartridge Kodak,	1.60

Films for Cartridge Roll Holders are special cartridges. See Cartridge Roll Holder.

Eastman's Transparent Films.

On Patent Spools to fit the Eastman-Walker Roll Holder.

Size.		Price.
3½ in.,	3½ x 4½ exposures, 24 exposures, \$1.00	48 exposures, \$2.00
4 "	4 x 5 " "	1.50 " 3.00
4½ "	4½ x 6½ " "	2.00 " 4.00
4¾ "	4¾ x 7¾ " "	2.70 " 5.40
5 "	5 x 8 " "	2.25 " 4.50
5 "	5 x 8 " "	3.00 " 6.00
6½ "	6½ x 8½ " "	4.00 " 8.00
8 "	8 x 10 " "	6.00 " 12.00

Kodak Films.

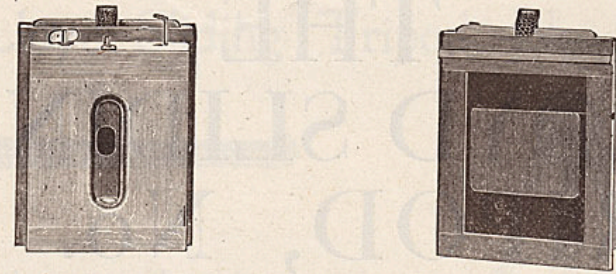
No. 1,	Length of Spool.	Price.	No. 4, Jr.,	Length of Spool.	Price.
" 1,	2½ in., 2½ in., 150 exposures,	\$3.75	" 4, Jr.,	4 in., 4 x 5, 48 exposures,	\$3.00
" 1,	2½ " 2½ " 100 "	2.50	" 4, Jr.,	4 " 4 x 5, 100 "	6.25
" 1,	2½ " 2½ " 50 "	1.25	" 4, Folding,	4 " 4 x 5, 48 "	3.00
" 2,	3½ " 3½ " 100 "	4.25	" 4, "	4 " 4 x 5, 100 "	6.25
" 2,	3½ " 3½ " 200 "	8.50	" 5, "	5 " 5 x 7, 32 "	4.00
" 2,	3½ " 3½ " 150 "	6.35	" 5, "	5 " 5 x 7, 54 "	6.00
" 2,	3½ " 3½ " 60 "	2.50	" 5, "	5 " 5 x 7, 100 "	11.00
" 3,	4½ " 3½ x 4½ " 60 "	2.50	" 6, "	6½ " 6½ x 8½, 24 "	4.00
" 3,	4½ " 3½ x 4½ " 100 "	4.25	" 6, "	6½ " 6½ x 8½, 48 "	8.00
" 3,	4½ " 3½ x 4½ " 250 "	10.50	A, "Daylight,"	3½ " 2½ x 3½, 24 "	.75
" 3, Jr.,	3½ " 3½ x 4½ " 48 "	2.00	A, "Ordinary,"	3½ " 2½ x 3½, 24 "	.65
" 3, "	3½ " 3½ x 4½ " 60 "	2.50	B, "Daylight,"	4 " 3½ x 4, 24 "	1.10
" 3, "	3½ " 3½ x 4½ " 100 "	4.25	B, "Ordinary,"	4 " 3½ x 4, 24 "	1.00
" 4,	5 " 4 x 5 " 48 "	3.00	C, "Daylight,"	5 " 4 x 5, 24 "	1.60
" 4,	5 " 4 x 5 " 100 "	6.25	C, "Ordinary,"	5 " 4 x 5, 24 "	1.50
" 4,	5 " 4 x 5 " 250 "	15.50			
" 4,	5 " 4 x 5 " 24 "	1.50			

Kodet Films.

No. 4, Regular,	4 x 5, 48 exposures, 4-in. spool,	Price.
" 4, Folding,	4 x 5, 48 " 5 " "	\$3.00
" 5, "	5 x 7, 32 " 7 " "	4.00
" 5, "	5 x 7, 54 " 7 " "	6.00

In ordering Kodak or Kodet Spools, always give the exact designation of the instrument.

The Eastman Cartridge Roll Holder.



Cartridge roll holders, which can be fitted to any ordinary camera by an intelligent cabinet-maker, are now available. They take special light proof cartridges of twelve exposures, are provided with red celluloid windows in the back for counting exposures in same manner as in the Cartridge Kodak system Kodaks, have an improved tension device to make the film lie flat during exposure, and are equipped with dark slides, making them interchangeable with plate holders when in the field. Well made of hard wood, with brass fittings, and handsomely finished.

Special Spools for Cartridge Roll Holders.

In ordering, specify for Cartridge Roll Holders, giving length of spool, as the spools are different from the ordinary spools.

PRICE LIST.

No. 1.	3½ x 4½,	5.00
No. 2.	3½ x 3½,	5.00
No. 4.	4 x 5 (specify whether horizontal or vertical),	5.00
No. 5.	5 x 7 (vertical only),	6.50
¾-in. cartridge,	12 exposures, for No. 2 roll holder,	.60
4 "	" 12 " 4 horizontal roll holder,	.90
4½ "	" 12 " 1 roll holder,	.70
5 "	" 12 " 4 vertical roll holder,	.90
7 "	" 12 " 5 " "	1.60
Glycerine,	prevents curling after development,	per oz., .12

Blair Light Proof Film Cartridges.

For Baby Hawk-eyes, Hawk-eye Jrs., and Tourist Hawk-eyes.

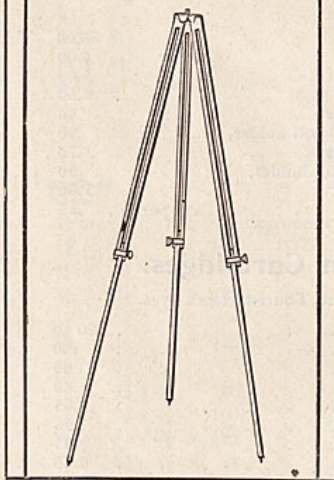
12 exposures,	2 x 2½ in., Baby Hawk-eye,	\$0.40
12 "	3½ x 3½ " Hawk-eye, Jr.,	.60
25 "	3½ x 3½ " "	1.20
12 "	3½ x 3½ " Tourist Hawk-eye,	.60
12 "	4 x 5 " Hawk-eye, Jr.,	.85
18 "	4 x 5 " "	1.25
12 "	4 x 5 " Tourist Hawk-eye,	.85
12 "	5 x 7 " special roll holder,	1.60

Blair Films.

Inches	Wide.	Long.	Equal to following exposures.	Price.	Inches	Wide.	Long.	Equal to following exposures.	Price.
108	25	3½ x 4½,	. . . . .	\$1.20	5	180	{ 44 5 x 4 or 25 5 x 7 or	\$3.00
215	50	"	2.40			{ 22 5 x 8,			
90	25	3½ x 3½,	. . . . .	1.10	5	355	{ 88 5 x 4 or 50 5 x 7 or	6.00
180	50	"	2.20			{ 44 5 x 8,			
130	25	4 x 5,	. . . . .	1.65	5½	105	25 5½ x 4,	1.65
255	50	"	3.30	5½	180	25 5½ x 7 or 43 5½ x 4,	3.00		
380	75	"	5.00	5½	205	50 5½ x 4,	3.30		
505	100	"	6.60	5½	355	50 5½ x 7,	6.00		
135	{	40 4½ x 3½ or 25 4½ x 5 or	}	1.65	6½	218	25 6½ x 8½,	4.40	
		22 4½ x 5½ or 20 4½ x 6½,			6½	435	50 "	8.80	
265	{	80 4½ x 3½ or 50 4½ x 5 or	}	3.30	8	255	25 8 x 10,	6.60	
		48 4½ x 5½ or 40 4½ x 6½,			8	505	50 "	13.00	
505	{	100 4½ x 5,	}	6.60	8½	167	25 8½ x 6½,	4.40	
					8½	330	50 "	8.80	

THE LLOYD SLIDING TRIPOD, No. 0.

This tripod is advertised this season for the first time. It represents positively the best value obtainable for the money. ❀ ❀ ❀ ❀ ❀ ❀ ❀ ❀



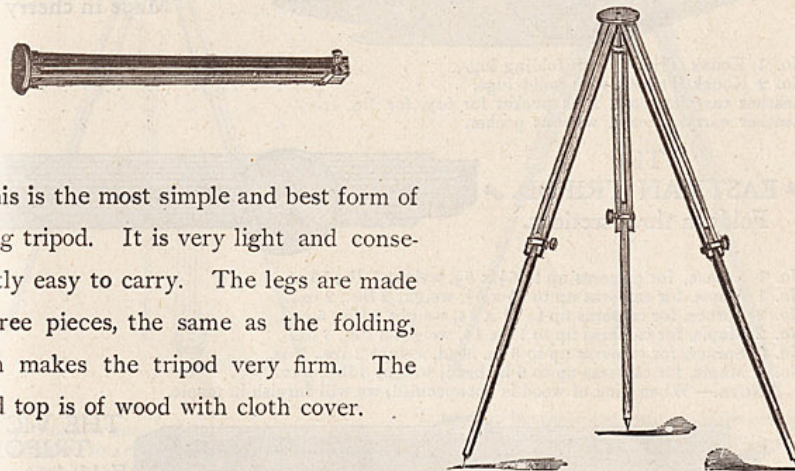
It is neat, attractive, strong, and serviceable, and will last for years. Made of spruce, well seasoned, and measures, when folded, about twenty-nine inches. It has brass top and trimmings, neatly nickelled, and a universal tripod screw, which will fit Rays, Pocos, Premos, etc.

*When fully extended it stands about fifty-four inches, a most convenient height for the ordinary person. By means of the clamp screws, the legs may be shortened to about thirty inches. The construction of the tripod makes it extremely rigid, and suitable for all but the heaviest cameras,—that is, $6\frac{1}{2} \times 8\frac{1}{2}$ and upwards. The tripod screw is very long, which makes it very easy to grasp and manipulate. Each tripod has a strap near the sliding joint, to keep it together while carrying. Every tripod is packed in neat paper box, ready for delivery.

Price, with neat paper box,

\$1.00.

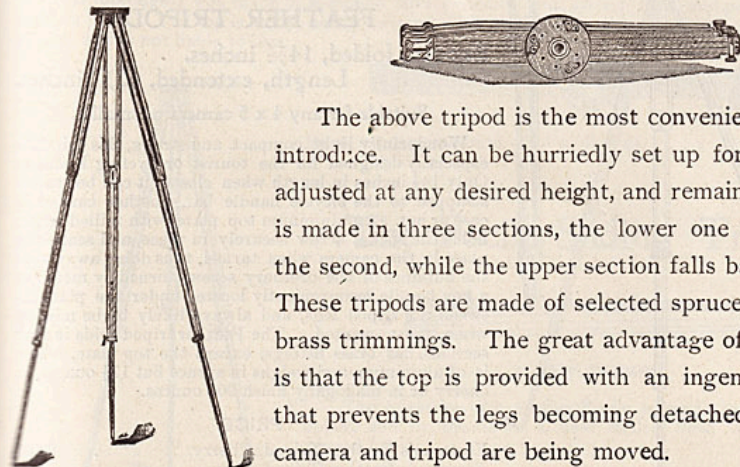
Lloyd Sliding Tripod, No. 1.



This is the most simple and best form of sliding tripod. It is very light and consequently easy to carry. The legs are made in three pieces, the same as the folding, which makes the tripod very firm. The tripod top is of wood with cloth cover.

Price, \$2.00.

The Lloyd Combination Tripod, No. 1.



The above tripod is the most convenient form we introduce. It can be hurriedly set up for use, easily adjusted at any desired height, and remains rigid. It is made in three sections, the lower one sliding into the second, while the upper section falls back upon it. These tripods are made of selected spruce with good brass trimmings. The great advantage of this tripod is that the top is provided with an ingenious device that prevents the legs becoming detached when the camera and tripod are being moved.

Price, \$2.50.

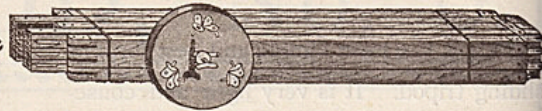
Eastman Kodak Company's Tripods.



THE KODAK TRIPOD.
Folds in four sections.
Made in cherry only.

No. 1 Kodak Tripod, with folding lugs,	\$5.00
No. 2 Kodak Tripod, with solid lugs,	4.00
Leather carrying case, with pocket for top, for No. 1,	3.00
Leather carrying case, without pocket,	2.00

The
EASTMAN TRIPOD.
Folds in three sections.



No. 1 Spruce, for cameras up to 6½ x 8½, weight 1 lb., 10 oz.,	\$3.00
No. 1 Maple, for cameras up to 6½ x 8½, weight 2 lbs., 2 oz.,	3.00
No. 2 Spruce, for cameras up to 11 x 14, weight 2 lbs., 6 oz.,	3.50
No. 2 Maple, for cameras up to 11 x 14, weight 3 lbs., 3 oz.,	3.50
No. 3 Spruce, for cameras up to 6 in. head, weight 2 lbs., 3 oz.,	4.00
No. 3 Maple, for cameras up to 6 in. head, weight 3 lbs., 5 oz.,	4.00

NOTE.— When kind of wood is not specified, we will furnish in maple.



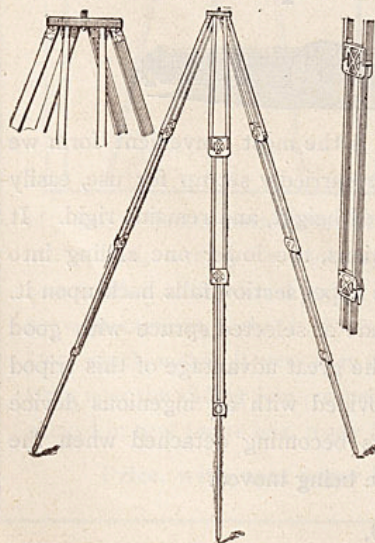
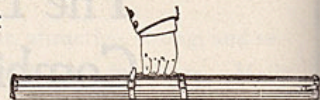
THE VICTOR TRIPOD.
Folds in two sections.

No. 1 Spruce, for cameras up to 6½ x 8½, weight 1 lb., 11 oz.,	\$2.00
No. 1 Maple, for cameras up to 6½ x 8½, weight 2 lbs., 3 oz.,	2.00
No. 2 Spruce, for cameras up to 11 x 14, weight 2 lbs., 6 oz.,	2.50
No. 2 Maple, for cameras up to 11 x 14, weight 3 lbs., 3 oz.,	2.50

NOTE.— When kind of wood is not specified, we will furnish in maple.

THE BULL'S-EYE TRIPOD:

The Bull's-eye tripod folds in two sections, and is provided with a leather hand strap for carrying. Made of the best seasoned spruce with brass fittings. Price, \$2.00



FEATHER TRIPOD.
Length, folded, 14½ inches.
Length, extended, 52½ inches.
Suitable for any 4 x 5 camera or smaller.

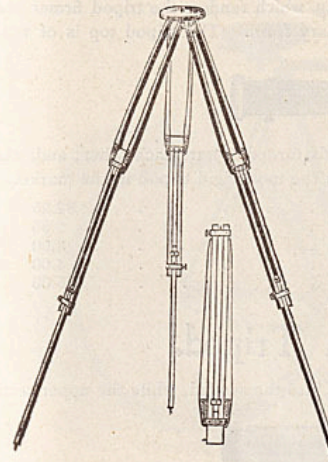
Wonderfully light, compact, and strong, this tripod is especially designed for the tourist or cycling Kodaker. Only 14½ inches in length when closed, it can be readily strapped to the bicycle handle bar, whether carried in case or not. An aluminum top plate, with milled edges, holds the socket screw securely in place, and seats it in place in the camera when turned, thus doing away with the nuisance of the ordinary screw, turned by means of a key handle inconveniently located under the plate between the tripod legs, and always likely to be missing when most wanted. The Feather tripod folds in four sections, has brass fittings, except the top plate, which is of aluminum, and weighs in spruce but 17½ ounces, in cherry or in mahogany finish 20½ ounces.

PRICE.

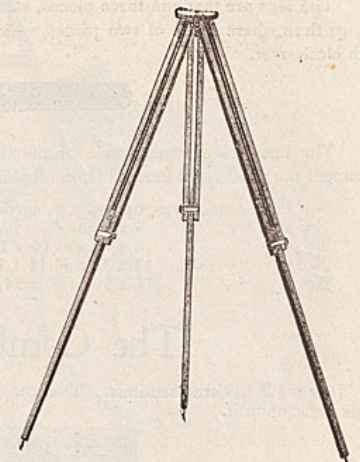
Eastman's Feather Tripod, Cherry,	\$4.00
Eastman's Feather Tripod, Spruce,	4.00
Eastman's Feather Tripod, Mahogany Finish,	4.50
Black Sole Leather Hand Carrying Case,	1.50

The Compact Tripod.

The Sliding Tripod.



This tripod is made to fold and slide, and can be adjusted to any desired length. The tripod screw is arranged to always remain in the top.



Is made of best selected spruce in three pieces, the centre one sliding within the outer ones, and can be clamped at any desired position. The legs are fastened to the top, which leaves the tripod always together and perfectly rigid.

No.	Size of Cameras.	Price.	No.	Price
1,	3½ x 4½ — 4 x 5 or 4½ x 6½,	\$2.00	1, for hand cameras (brass head),	\$1.50
2,	5 x 7 — 5 x 8 " 6½ x 8½,	2.50	For all sizes up to	
3,	8 x 10 " 10 x 12,	3.00	2, 5 x 8,	2.00
4,	11 x 14 " 14 x 17,	3.50	3, 8 x 10,	2.50
			4, 11 x 14,	3.00
			5, 18 x 22,	3.50

Standard Folding Tripod.

It is thoroughly well made of seasoned spruce, and is light, strong, rigid, and perfectly durable in all its parts. The top is wood, neatly covered with cloth. The screw remains attached, ready for use, and is not liable to loss.



Price, for cameras from 4 x 5 to 6½ x 8½, \$1.50

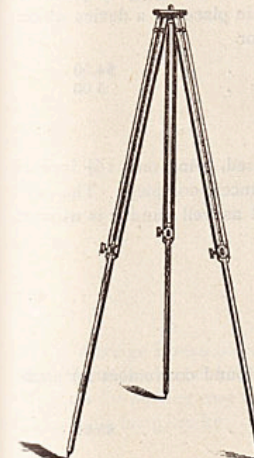
The Facile Sliding Tripod.



A NEW DESIGN.

The lower section of the Facile is made to slide into the upper, and by means of a neat milled head is held at any desired height.

No. 1. For 4 x 5 and 5 x 7 cameras, weight 17 oz.,	\$2.00
No. 2. For 6½ x 8½ cameras, weight 1 lb., 9 oz.,	2.25



Carlton's Sliding Tripod.

The legs are made in three pieces, same as the folding, which renders the tripod firmer when set up than where made of two pieces, which is the ordinary form. The tripod top is of wood, with cloth over.



The brass clamps each side of the leg have the ends turned toward each other; and, when clamped, the pressure is exerted from all sides, rendering it the most rigid tripod in the market.

No. 1.	For cameras, up to 5 x 7, spruce,	2.50
No. 2.	" " 5 x 8 and 6 1/2 x 8 1/2, spruce,	3.00
No. 3.	" " 8 x 10 and 10 x 12, ash,	4.00
No. 4.	" " 11 x 14 and 14 x 17, ash,	5.00
No. 5.	" " 17 x 20 to 20 x 24, ash,	

The Combination Tripod.

It is made in three sections. The lower section slides into the second, while the upper section folds back upon it.



The top is provided with an ingenious device, which prevents the legs from becoming accidentally detached when in position for use. The legs can be detached only by raising the lower end to nearly a horizontal position.

No. 0.	Spruce, for 4 x 5 cameras, weight 1 lb.,	3.00
No. 1.	" " 5 x 7 " " 1 " 6 oz.,	3.25
No. 2.	" " 6 1/2 x 8 1/2 " " 1 " 9 "	3.50
No. 3.	Ash, " 8 x 10 " " 4 " 6 "	

The Premo Tripod.

The Premo Tripod is the lightest yet made, and has three joints. The lower section slides into the second, and these two into the third, while the upper section folds back upon the third. Has aluminum head.



The legs of the tripod may be grasped at the top for the purpose of changing its position, without fear of separating them from the head. They are held securely in place by a device which prevents them from becoming detached, except at the will of the operator.

No. 1.	For 4 x 5 cameras, weight 15 oz.,	4.50
No. 2.	" 5 x 7 and 6 1/2 x 8 1/2 cameras, weight 1 lb., 7 oz.,	5.00

The Petite Tripod.

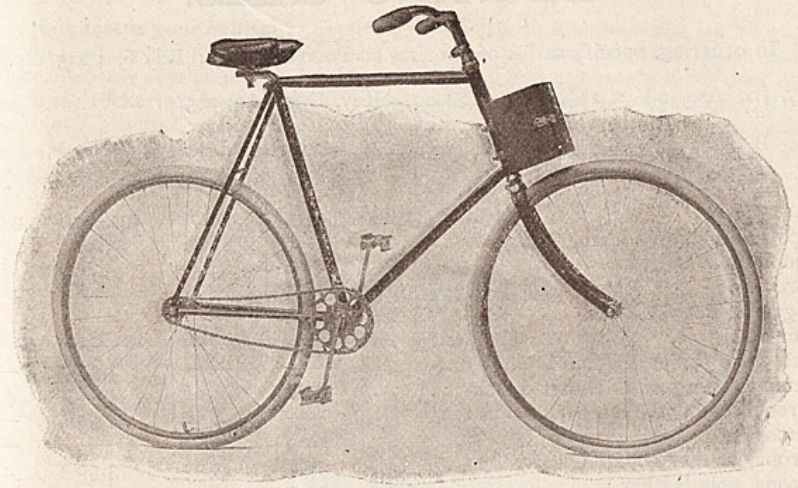
The Petite Tripod is exceedingly compact, the length, when closed, being only 16 1/2 inches. When extended for use, the length is 55 inches. Weight, only 17 ounces, complete. The construction of the Petite Tripod renders it not only compact, but rigid as well; and it is without question one of the best tripods yet introduced.



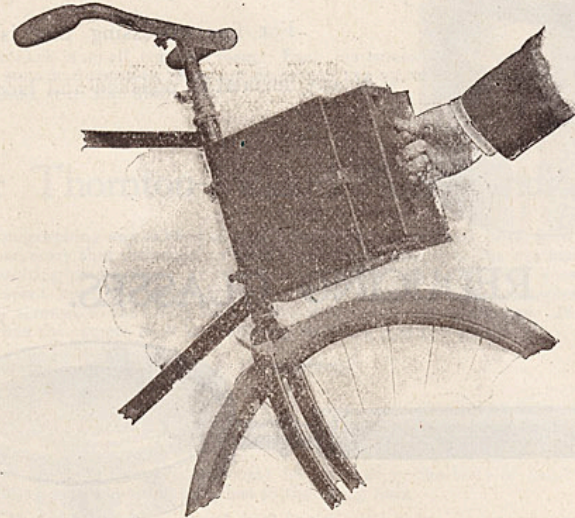
The head can be detached from the legs if desired. This will be found convenient for packing in a small valise or hand satchel.

No. 1.	For 4 x 5 and 5 x 7 cameras,	5.00
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Kodak Bicycle Carrying Cases.



Pocket Kodak bicycle carrying case,	\$1.00
Folding Pocket Kodak combination case (specify whether No. 1 or No. 2),	1.25
Folding B. E. combination case,	1.25
Style A cases, for No. 2 Bullet, Bull's-eye, and Falcon, and No. 2 Bullet and Bull's-eye specials (specify which),	2.00
Clamp to hold case on bicycle head (fits any tubing from 1/2 to 1 1/4),	.50
Detachable lamp bracket (goes on front of case),	.25
Style B cases, for any wheel, with mud guards, for No. 2 Bullet, Bull's-eye, Falcon, Bull's-eye Special, and Bullet Special Kodaks (needs 6 in. clear from guard to saddle spring),	1.50



No. 4 Cartridge Kodak bicycle case,	\$2.50
No. 5 Cartridge Kodak bicycle case,	3.25
Washers for holding case front of brake rod,	.50
Detachable lamp bracket,	.25

CARRYING CASES.

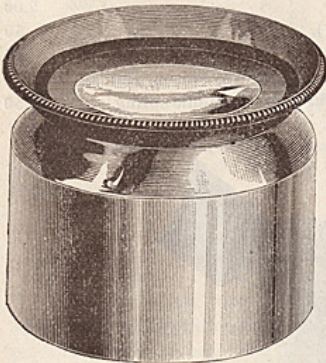
In ordering, specify series of camera, as Poco B, 5 x 7; Ray 6, 4 x 5, etc.

Ray, Jr., case, 2 1/2 x 2 1/2, . . .	\$1.00	Ray, D, case, 4 x 5, . . .	\$2.00
" " " 3 1/2 x 3 1/2, . . .	1.25	" E " 4 x 5, . . .	2.00
" B " 3 3/4 x 4 1/4, . . .	1.50	" series 4, 5, and 6, 4 x 5, . . .	2.00
" C " 4 x 5, . . .	2.00	" " 4, 5, and 6, 5 x 7, . . .	3.00

	4 x 5.	5 x 7.	6 1/2 x 8 1/2.	8 x 10.
Poco Folding, sole leather, tan, . . .	\$2.50	\$3.00	\$3.50	\$4.00
Telephoto Poco, . . .	3.00	3.50	4.50	5.50
Stereo Poco, . . .	—	3.00	—	—
Magazine Poco, . . .	1.50	—	—	—
Gem Poco, . . .	1.40	—	—	—
Poco, view cameras, (canvas), . . .	—	—	2.50	—
Premo Folding, sole leather, black, . . .	3.50	4.00	4.50	5.00
Stereo Premo, sole leather, black, . . .	—	4.00	4.50	—
Premo Vee, . . .	1.25	—	—	—
Korona, leather covered, . . .	2.50	3.00	3.50	4.00
Korona, sole leather, . . .	3.50	4.00	4.50	5.00

Munroe, No. 3, combination, \$2.00; No. 2, combination, \$1.50; No. 5, 4 x 5, \$3.00; 5 x 7, \$4.00.

Cyclone Magazine, No. 1, \$1.50; Nos. 2 and 4, \$2.00; Nos. 3 and 5, \$2.50.

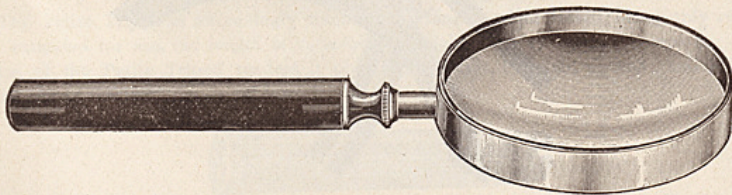


FOCUSSING GLASSES.

For fine focussing this is invaluable.
Neatly finished in polished and lacquered brass.

Price, \$0.50

REDUCING GLASSES.



Number,	252cc.	254cc.	256cc.	258cc.	260cc.	262cc.
Diameter, inches,	2	2 1/4	3	3 1/4	4	5
Price, each,	\$1.50	\$2.00	\$2.50	\$3.00	\$4.00	\$6.00

The Pickering Speed Tester.

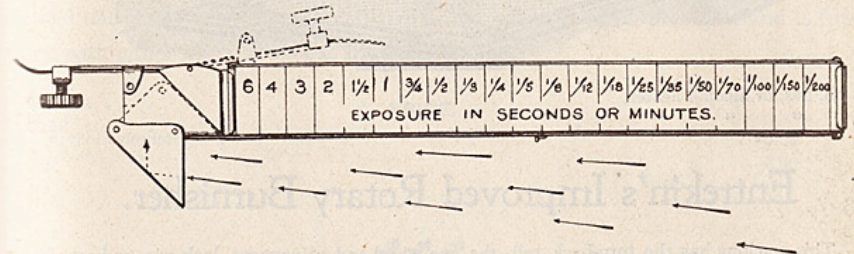
How fast is your shutter? The shutters of ordinary snapshot cameras are not marked with their speed, but the higher grade cameras are. These markings are seldom reliable, and are responsible in many cases for poor results obtained. You can learn the exact speed of your shutter by using the **Pickering Speed Tester**, invented and used by Professor Pickering of Harvard Observatory. In a handy and simple manner it applies the fundamental law of the pendulum, and registers accurately any speed from 1-100 of a second to a full second. It will register the work of cheap cameras as well as the expensive kind, and it can be used over and over again indefinitely.

Price, \$0.50

Exposure Meters.

Watkins, with F. Ring, exposure ribbon, and book of table,	\$5.00
Extra exposure ribbons, each . . . . .	.50
Copy of exposure note, . . . . .	.50
Wynne's exposure meter,	2.75
Extra ribbons, . . . . .	.20

The Expodak.



Made of nickel, in small, compact form. Each instrument furnished with instruction books, telling all about stops and shutters, reloading Expodaks, timing enlargements, platinotype and carbon prints, and iso-plates, with Ray filters, etc.

Price, \$1.85

The Thornton-Pickard Plumb Indicator.

When photographing any subject in which there are two vertical lines, such as buildings, etc., it is absolutely necessary that the sensitive plate should hang plumb, or the vertical lines will not be parallel in the resulting photograph. It is difficult to judge when the plate does not hang plumb without either a spirit level or a plumb indicator. The latter is by far the simplest and best device. It is permanently screwed to the swing back of the camera, and cannot get lost. It shows at a glance with certainty when the camera back and sensitive plate are true and plumb.

Price, complete, with screws ready for attaching, \$0.20

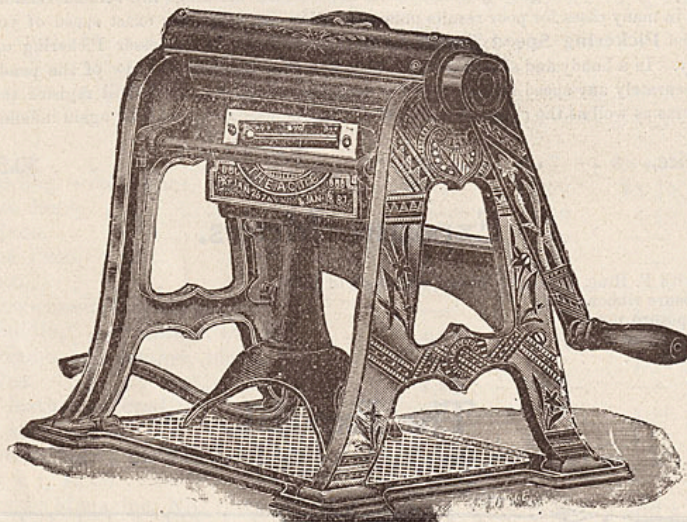
Camera Levels.

These levels are quite compact, and may be attached to the body of hand cameras; but if a tripod camera is used, they should be attached to the swing back.

No. 1. In metal mounting, round, with flange screw holes,	\$0.75
No. 2. In metal mounting, round, large size,	1.00
No. 3. In metal mounting, without flange, . . . . .	.75
No. 5. Pocket level, . . . . .	.75
No. 6. Double level, . . . . .	.40
Round and flat, in brass, . . . . .	.75

Acme Rotary Flue-heating Burnishers.

One hand wheel adjustment; even tension. Acme thermometer attached.



11-in. oil, gas, or alcohol heater,	\$25.00
15-in. " " " "	35.00

Entrekin's Improved Rotary Burnisher.

This machine has the turn-back roll, the one wheel end adjustment, lock nut, and set screw and swing fire pan.

The 10-inch size is made in two styles, light and heavy.

It may be heated with alcohol, oil, or gas.

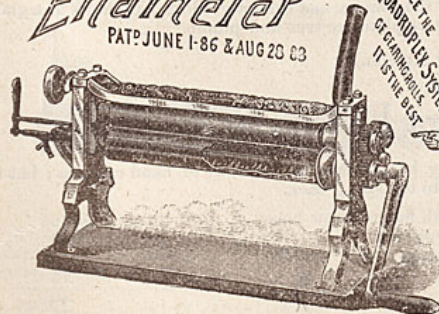
	Price.		Price.
8-in. roll	\$12.00	15-in. roll	\$30.00
10 " " light,	15.00	20 " "	40.00
10 " " heavy,	25.00	25 " "	55.00

No scratches. No sweat. No smoke.
 No soot. No lubricating. No dirt.
 No discomfort from heat. Quick heater.
 Elegantly finished.

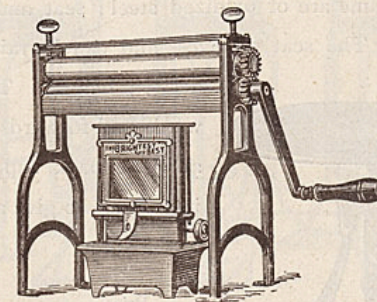
	Price.
10-inch,	\$30.00
15 " "	40.00
20 " "	50.00
25 " "	60.00

In ordering, don't forget to specify whether gas or gasoline attachment is wanted.

THE GLOBE
Enameler
 PAT. JUNE 1-86 & AUG 20 03



Brilliant Photo Burnisher.

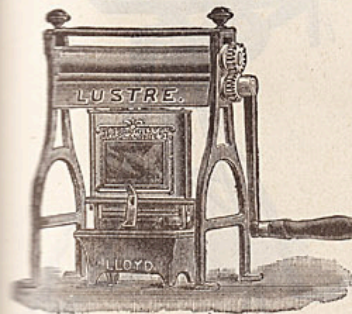


Is made in two sizes, 8 and 10 inch rolls. The rolls are made of steel, highly polished and nickeled. Has thumb-screws for adjustment of pressure, and is furnished with either oil lamp or gas burner.

	PRICE.		PRICE.
8-inch, complete,	\$5.00		
10 " " " "	6.00		

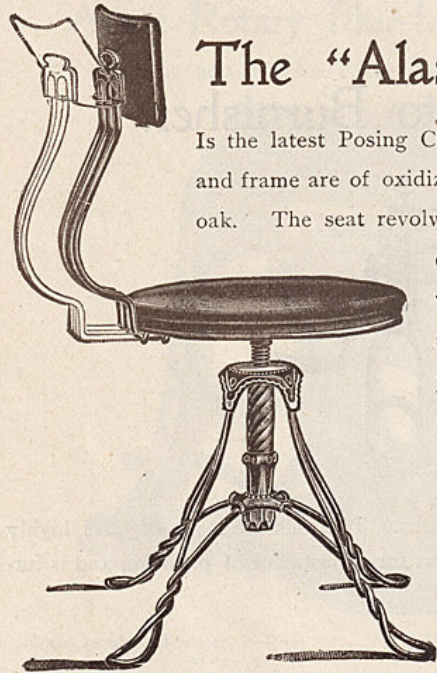


The Lustre Burnisher.



For the amateur we offer the popular Lustre Burnisher, a neat, attractive, and durable instrument. It has a double roll, with a screw adjustment for varying pressures, and the upper roll roughened, so as to pull the mounts along. Each instrument furnished with a substantial oil heater, neatly nickeled and lacquered.

Price, \$5.00.



The "Alaska" Posing Chair

Is the latest Posing Chair for bust portraits. The legs, back, and frame are of oxidized steel; seat and back support are of oak. The seat revolves, and can be raised or lowered to any desired height. The back slides backwards and forwards, as shown in the cut; and the back support automatically adjusts itself to give a maximum of comfort to the sitter.

Price, \$7.00

The Elite Posing Chair.

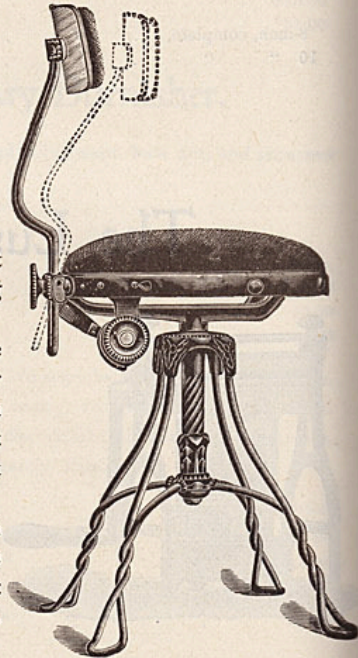
Unique, Handsome, Indestructible.

This is the latest and one of the best chairs ever offered the trade for use in posing subjects for bust pictures.

The seat revolves on a screw, which at the same time elevates or depresses it to suit any height of subject. A clamp under the seat can be used to tighten the screw, so that the subject will not turn the seat involuntarily. The back is adjustable, both vertically and horizontally.

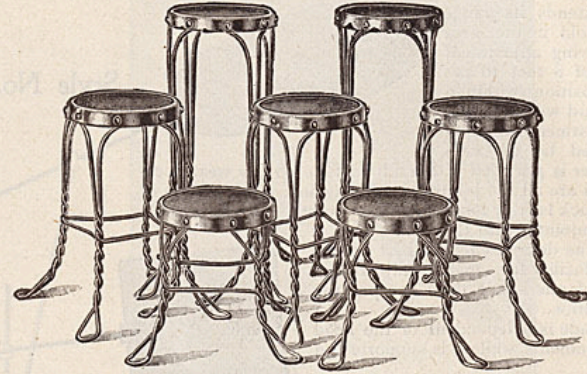
The frame of bent steel rods, plated in antique copper, is practically indestructible, as well as handsome in design and finish; and it will not look shabby, even after years of use.

It is warranted to please.



Antique copper finish, oak seat and back,	Price.
" " " plush or leather seat and back,	\$8.00
	9.50

The Globe Grouping Stools.



These are made of twisted steel rods, antique copper finish, oak seats. They are the most compact, durable, attractive and sensible grouping arrangement ever devised, as well as the lowest (quality considered) in price.

No. 1 is 11 inches high, No. 2, 17 inches, and No. 3, 24 inches.

Price for any height, \$2.50 each.

The Centennial Head Rest.

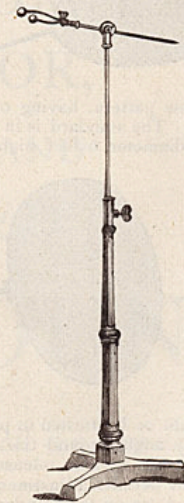


Plain and neat, with no chance for dust.

THE PRICES ARE:

Tall,	\$2.75
Short,	2.50

Success Head Rest.



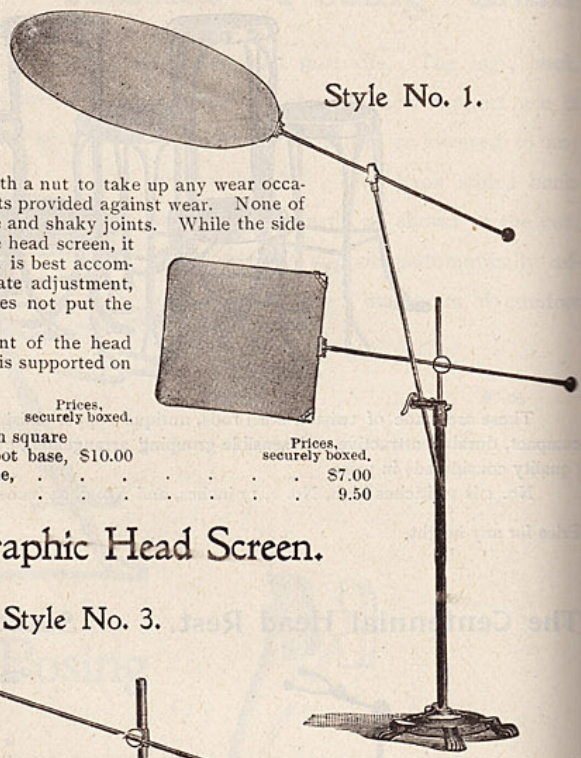
Tall,	\$3.25
Short,	3.15
With back support 75 cts. extra.	

White's Perfection Head Screen and Side Shade.

The base standard has the double or duplex joint, providing a separate rod for the new compound clamping and swivelling joint.

In this style the head screen is held by a projecting joint on the base support, having the sectional ball and slide rod movement, which extends its range more than twofold in the area it will cover, giving adjustment from a height of 8 feet to the floor to any position within a circle of 8 feet, and without other means of adjustment than is instantly afforded by the cam lever, which latter is provided with a nut to take up any wear occasioned by use, as are all the joints provided against wear. None of the parts have back lash or loose and shaky joints. While the side shade is used conjointly with the head screen, it is evident that the desired effect is best accomplished by this facility for separate adjustment, as the placing of one shade does not put the other out of position.

The side shade is independent of the head screen in its movements, while it is supported on the same base.

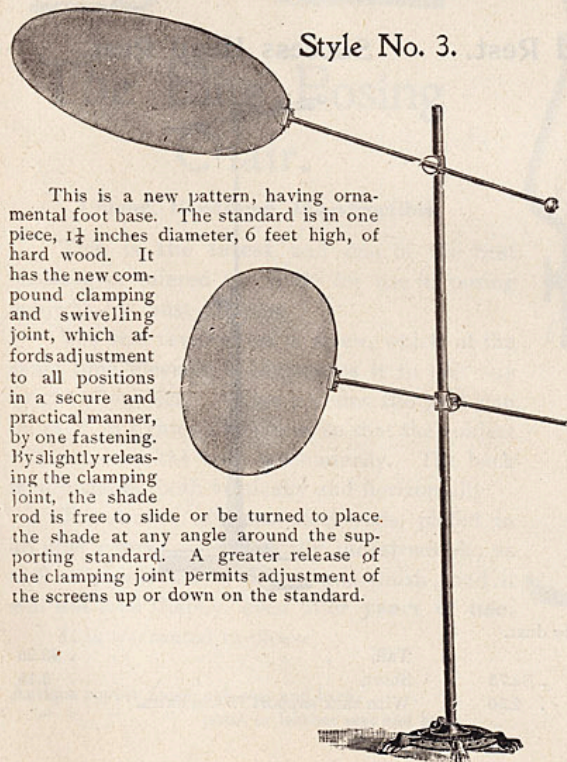


Style No. 1.

- | | |
|--|-------------------------|
| No. | Prices, securely boxed. |
| 1. Head screen, as illustrated, with square side shade and ornamental foot base, | \$10.00 |
| 1. Head screen, without side shade, | 7.00 |
| 1. Head screen, with oval shade, | 9.50 |

- | |
|-------------------------|
| Prices, securely boxed. |
| \$7.00 |
| 9.50 |

White's Photographic Head Screen.



Style No. 3.

This is a new pattern, having ornamental foot base. The standard is in one piece, 1 1/4 inches diameter, 6 feet high, of hard wood. It has the new compound clamping and swivelling joint, which affords adjustment to all positions in a secure and practical manner, by one fastening. By slightly releasing the clamping joint, the shade rod is free to slide or be turned to place the shade at any angle around the supporting standard. A greater release of the clamping joint permits adjustment of the screens up or down on the standard.

No. 1 Perfection Head Screen and Square Side Shade.

PRICES.

- | | |
|---|--------|
| No. 3. Head screen, as illustrated, with oval side shade, | \$7.00 |
| If with square side shade, | 7.50 |
| No. 3. Head screen, without side shade, | 4.50 |

In ordering side shades for this style, specify that they are for No. 3 pattern.



We shall be pleased to send on application sample photographs of all the leading

INTERIOR,
EXTERIOR,
PLAIN, AND
CLOUDED

BACKGROUNDS.

We are constantly on the alert for all the newest and choicest designs.

It will pay you to see our line before purchasing.

Developing and Toning Trays. Compressed Fibre Trays.

Shallow and Deep. Deep Trays have Lips.
The latest, the cheapest, the best. Smooth, handsome, strong.
Guaranteed to be acid and alkali proof.

Size, $3\frac{1}{2} \times 4\frac{1}{2}$,	shallow, price \$0.20	deep, price \$0.50
" 4 x 5, . . . . .	.28;	" " .70
" 5 x 7, . . . . .	.42	" " .85
" 5 x 8, . . . . .	.56;	" " 1.15
" $6\frac{1}{2} \times 8\frac{1}{2}$, . . . . .	.72;	" " 1.75
" 8 x 10,	1.08;	" " 2.40
" 10 x 12,		" " .75
" 11 x 14,		
" 4 x 13, for panoramic films,		

Glossy Hard Rubber Trays. Shallow Only.

With finger depressions to aid in lifting plates.

Size, $3\frac{1}{2} \times 4\frac{1}{2}$,	Price \$0.20
" 4 x 5, . . . . .	.35
" 5 x 8, . . . . .	.56
" $6\frac{1}{2} \times 8\frac{1}{2}$, . . . . .	.72
" 8 x 10,	1.08

Vulcanite Trays.



$4\frac{1}{2} \times 5\frac{1}{2}$, deep,	\$0.55	$8\frac{1}{2} \times 10\frac{1}{2}$, deep,	\$1.25	18 x 22, deep,	\$6.00
$5\frac{1}{2} \times 7\frac{1}{2}$, " . . . . .	.70	$10\frac{1}{2} \times 12\frac{1}{2}$, "	1.85	19 x 24 "	6.75
$5\frac{1}{2} \times 8\frac{1}{2}$, " . . . . .	.80	12 x 16 "	2.60	21 x 26 "	8.50
7 x 9 " . . . . .	.95	15 x 19 "	4.75		

Porcelain Trays

Are white and show discoloration of developer readily, making them superior for Bromide and Velox developing.

	Deep.		Deep.
5 x 7,	\$0.62	11 x 14,	2.64
5 x 8, . . . . .	.75	14 x 17,	6.60
7 x 9, . . . . .	.82	16 x 20,	8.00
8 x 10,	1.00	20 x 24,	16.00
10 x 12,	1.66		



Papier Maché Trays.

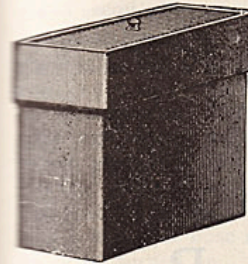
A recent importation of superior quality, and at reduced prices. These goods are very durable, light in weight, and deep. They are black in color, and in general appearance not unlike the hard rubber tray.

$3\frac{1}{2} \times 4\frac{1}{2}$, each, \$0.25	$8\frac{1}{2} \times 10\frac{1}{2}$, each, \$0.90	$16\frac{1}{2} \times 20\frac{1}{2}$, each, \$3.25
$4\frac{1}{2} \times 5\frac{1}{2}$, " .30	$10\frac{1}{2} \times 12\frac{1}{2}$, " 1.25	$19\frac{1}{2} \times 24$, " 5.00
$5\frac{1}{2} \times 7\frac{1}{2}$, " .35	$12\frac{1}{2} \times 14\frac{1}{2}$, " 1.75	23 x 27, " 6.00
$5\frac{1}{2} \times 8\frac{1}{2}$, " .40	$14\frac{1}{2} \times 18$, " 2.75	26 x 30, " 9.75
7 x 9, " .60		28 x 34, " 10.50

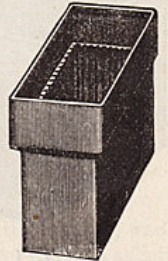
Glass Trays.

4 x 5 plates or smaller,	\$0.25	7 x 9 plates or smaller,	\$0.65
5 x 8 " " . . . . .	.40	8 x 10 " " . . . . .	.75

The Universal Hard Rubber Fixing Box.



No. 1.



No. 2.

Differs from our regular Fixing Box in that it has ridges or grooves on all four sides. Each size takes several sizes of plates; large ones the long way, small ones the short way of the box (see Fig. 2). The box also has a cover to keep out dust and prevent evaporation.

All these boxes save your hypo, plates, and temper.

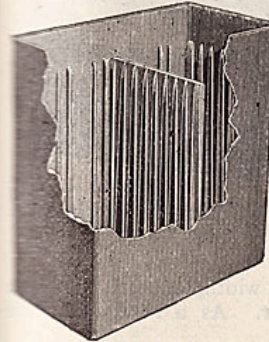
is made in two sizes. No. 1 allows of twenty $3\frac{1}{2} \times 4\frac{1}{2}$, $4\frac{1}{2} \times 5\frac{1}{2}$, or $4\frac{1}{2} \times 6\frac{1}{2}$, or eleven $6\frac{1}{2} \times 8\frac{1}{2}$ plates being fixed at one time.

Price, \$4.50

No. 2 allows of twenty-two 4 x 5, 5 x 7, or 5 x 8, or eleven 8 x 10 plates being fixed at one time.

Price, \$5.00

Composition Fixing Boxes.

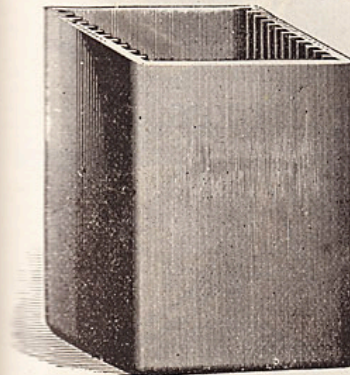


Fixing bath for 4 x 5,	\$2.00
" " " 5 x 7 or 5 x 8,	2.25
" baths " same, with partitions,	3.00
" " " 8 x 10,	3.50
" " " same, with partitions,	4.00

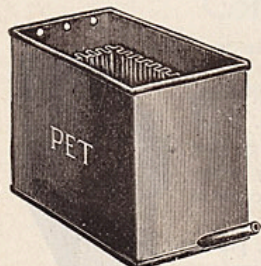
Hard Rubber Fixing Baths.

The advantages of this bath are: *first*, that it is made of hard rubber; *second*, that it is smooth and can easily be kept clean; *third*, that it holds one dozen plates, thus saving many trays; *fourth*, that it has a ridge at the bottom which keeps the plate above any sediment that may collect there; *fifth*, that the edges of the film will not be scratched in the groove.

For $3\frac{1}{2} \times 4\frac{1}{2}$, or lantern-slide plates,	\$1.75
" 4 x 5 plates,	2.15
" $4\frac{1}{2} \times 6\frac{1}{2}$ "	2.30
" 5 x 7 "	2.60
" 5 x 8 "	2.85
" $6\frac{1}{2} \times 8\frac{1}{2}$ "	3.50
" 8 x 10 "	4.00



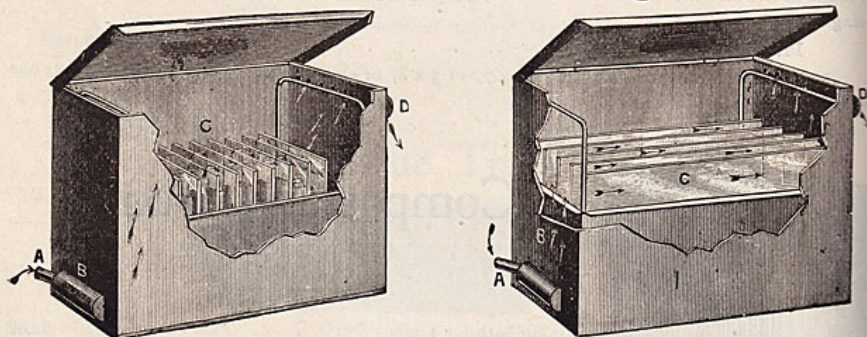
Pet Washing Box



Takes either six plates, size 5 x 7, or twelve, 4 x 5. It feeds from the bottom by means of a hose, which may be coupled direct to the water faucet. Adapters may be furnished, so as to take any size from 5 x 7 down.

Price,	\$1.00
Price, with adapters for smaller plates,	1.25
Hose, per foot, size to fit inlet,	.12
Faucet connections,	.15

The Perfection Washing Box.



In the arrangement of these washing boxes several advantageous principles have been carried out:

1. Each box takes several sizes of plates.
2. The water enters the bottom of the box in its full width, and strikes all the plates at once. It leaves the box in the same manner. As a result, the box washes the plates thoroughly.
3. The plates rest on a metallic rack, and can be removed in one single motion, the rack then serving as a drying rack.
4. Two sizes will suffice to wash all plates from 3 1/4 x 4 1/4 to 8 x 10.

No. 1 takes twenty-two plates 3 1/4 x 4 1/4, or 4 1/4 x 6 1/2, or twelve 6 1/2 x 8 1/2,	Price.
" 2 " " " 4 x 5, or 5 x 7, or 5 x 8, or twelve 8 x 10,	\$2.00
	2.25

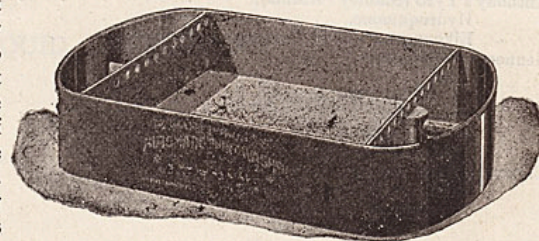
Scovill Washing Boxes.

For 3 1/4 x 4 1/4 plates,	Each.
" 4 x 5 " and smaller size,	\$1.60
" 4 1/4 x 5 1/2 " " " "	1.75
" 4 1/4 x 6 1/2 " " " "	1.90
" 5 x 7 " " " "	2.00
" 5 x 8 " " " "	2.10
" 6 1/2 x 8 1/2 " " " "	2.15
" 8 x 10 " " " "	2.25
" 10 x 12 " " " "	2.50
" 11 x 14 " " " "	4.00
" 14 x 17 " " " "	5.00
" 8 x 10, adjustable washing box,*	7.50
	4.00

* Adjustable for 6 1/2 x 8 1/2, 5 x 8, 5 x 7, 4 x 5, 3 1/4 x 4 1/4 plates. All sizes to be washed at once.

California Automatic Print Washer.

It is a recognized fact that washing in constantly changing water is superior to a continual soaking. The last washing is beyond a doubt the most important operation of the entire process, and it is the most neglected in many cases. Prints placed in this washer need no attention, and thus its cost is saved in labor alone.

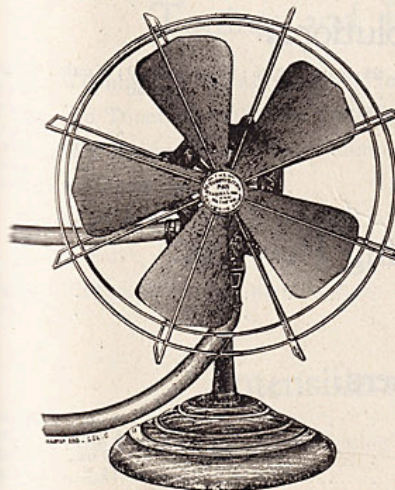


A rubber hose is attached to the tap and the inlet pipe of the washer, and the water turned on. The water fills the space between the bottom of the washer and the perforated bottom of the tank, and fills the tank by rising through the perforations in the bottom. The water then rises in the pipes in the pockets at the right and the left of the tank. The weight of the tank resting on one of the valves closes the outlet of the side pipe in the pocket on the lower side, consequently opening the outlet of the pocket and carrying off the overflow of the tank. On the opposite side of the tank the valve closes the outlet of the pocket by its own weight, and the water from the side pipe fills the pocket until the water in the pocket becomes of sufficient weight to throw that end of the tank down, opening the valve on the side, closing the other, and repeating the operation. The water in the tank takes an upward and circular motion from being forced through the small holes, and the rocking of the tank gives the entire body of water exactly the same motion that separates the prints in the ordinary tray by rocking. With this apparatus prints never settle to the bottom of the tank, but float in the water, and move gently from side to side.

The face of each print is in this way presented to the moving water, and imperfect washing is an impossibility.

They are furnished in three sizes, and made and finished for service and wear.

	PRICE.	
12 x 12 inches,		\$7.00
20 x 20 " " "		8.50
25 x 25 " " "		10.00



Water Fans.

May be attached to city faucet. Wastes no water, as the overflow should discharge into the washing box. It keeps the dark-room cool, and gives the best means for drying plates rapidly.

Price, with wall brackets,	\$7.50
Base, for use when not fixed in position,	1.00
Hose (inlet or outlet), per foot,	.10

Liquid Developers.

Anthony's Pyro (Stanley formula),	2 8-oz. bottles,	\$0.50
Hydroquinone,	8-oz. bottle, \$0.30; 16-oz.,	.55
Eikonogen,	8 " " .30; 16 "	.55
Gennert's Metol (conc.),	8 oz., \$0.35; 16 oz.,	.60
Ortol,	Set of 2 8-oz. bottles,	.50
Iko-Hydro (conc.),	8 oz., \$0.30; 16 oz.,	.50
Eikonogen	8 oz., .30; 16 "	.50
Metol Glycin	" " " 16 "	.60
Hydrokinone	8 oz., .30; 16 "	.50
Carbutt's Hydrochinon,	2 8-oz. bottles,	.60
Eiko-cum-Hydro,	2 " "	.60
Pyro potash,	" "	.60

Intensifiers and Reducers.

Lloyd's Intensifier,	2 8-oz. bottles,	\$0.50
W. & C. Perfect Platinum Intensifier,		.85
Anthony's Permanent Reducer,	8-oz. bottle,	.30

Developing Powders.

Eastman Pyro powders,	12 in box,	\$0.50
Hydroquinone powders,	" " "	.50
Eikonogen	" " "	.50
Amidol	" " " for Dekko papers,	.50
Seed's Pyro	6 " "	.25
Hydroquinone	" " "	.25
Metol-Hydro	" " "	.25
Eiko-Hydro	" " "	.25
Eikonogen cartridges, per box of 10,		1.50
Amidol		1.50
Metol	\$0.20; per box of 6,	1.20
Nepera Chemical Co. Metol-Quinol for Velox papers, tins, making 16 oz.,	tubes " 4 "	.50
" " " " " " " "	" " " 4 "	.15
Lloyd's Metol-Quinol tubes for Velox papers, making 4 oz.,	" " " 4 "	.10
" Trenol Quinol " " " " " "	" " " 4 "	.10
Carbutt's Metol-Hydro Powders, 6 in box,		.25
" " " " Tubes, 6 " "		.50
Ross Glyco-Pyro,		.50
Karma developing tablets,		.25

Toning Solutions.

Rayon toning and fixing solution,	4 oz., 25; 8 oz., \$0.35; 12 oz., \$0.50; 1/2 gals.,	\$2.00
Kloro " " " " " "	12 " .50 " "	2.00
Solio " " " " " "	4 oz., 30; 8 oz., .50 " "	2.00
Aristo Gold, Delta Gold, Mephisto Gold,		.50 and 1.00
Aristo Platinum, Delta Platinum, Mephisto Platinum,		.50 " 1.00
Aristo or Mephisto single toners,		.50 " 1.00
Anthony's Aristotype toning and fixing solution,	8-oz. bottle,	.40

Toning and Fixing Powders.

Lloyd's toning and fixing powders,		\$0.25
Karma toning tablets,		.25

Hardeners.

Solio hardener	8 oz.,	\$0.35
" " "	1/2 gals.,	1.75
" " tins, making	16 oz.,	.40
Kloro " "	12 "	.50

Mitchell's Developers.

LIQUID DEVELOPERS.

Hydro-Metol,	half-pints, \$0.35; pints,	\$0.60
Eikonogen,	" " .35; "	.60
Metol,	" " .35; "	.60
Hydrokinone,	" " .30; "	.50
Lantern Slide,	" " .40; "	.75
Handy,	" " .25	
Eikonogen and Hydrokinone,	2 8-oz. bottles,	.50

POWDER DEVELOPERS.

Hydro-Metol, 6 tubes, each making 8 oz. developer,		\$0.50
Phaino-Fix, will develop and fix 18 to 24 4 x 5 plates,		.25
Snap Shot, 6 sets of tubes, makes 1/2 gal. two-solution developer,		.50
Phainogen, 6 sets of tubes, making 48 to 72 oz. developer,		.75
Bromide Paper, 6 sets of tubes, sufficient for 6 doz. 5 x 7,		.35
Eikonogen, 6 sets of powders, making 1 1/2 pints,		.25
Hydrokinone, 6 " " " " 1 1/2 " "		.25
Eiko-Quinone, 6 " " " " 3/4 pint,		.50
Pyrogallol, 6 " " " " 1 1/2 pints,		.25

Toning and Fixing Preparations.

Auric Toning Fluid, two solutions, for 6 doz. 5 x 7 prints,		\$0.75
Collodio Toner, one solution (1 oz. tones 1 doz. 5 x 7), half-pints, \$0.50; pints,		1.00
Standard Toning and Fixing Solution,	" " .35; "	.60
Handy Toner (gelatine),	" " .25	
Tone-an-Fix, powder (for gelatine prints),		.25
Fixing Salt:		
Pint size, \$0.08; quart size, \$0.15; half-gallon size, \$0.25; gallon size,		\$0.50

Intensifiers and Reducers.

Standard Intensifying and Reducing Solutions, set of 3 8-oz. bottles,		\$0.75
Universal Intensifier	" " 2 4 " "	.35

Dark Room Accessories.

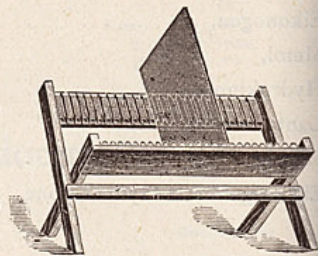
NEGATIVE BOXES, holding 24 plates.

3 1/4 x 4 1/4,	\$0.60	8 x 10,	\$1.10
4 x 5, . . . . .	.65	10 x 12,	2.00
5 x 7, 5 x 8, . . . . .	.85	11 x 14,	3.00
6 1/2 x 8 1/2, . . . . .	.90	14 x 17 (12),	3.50

NEGATIVE RACKS.

They fold up flat, are made of best seasoned cherry, neat, and will hold any size negative.

Price, \$0.25



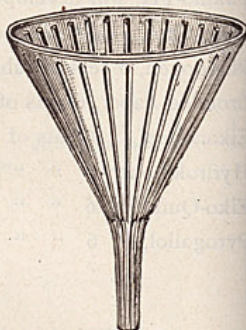
ABSORBENT COTTONS.

1-lb. package,	\$0.55	1/2-lb. package,	\$0.35	1/4-lb. package,	\$0.20
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FUNNELS.

These funnels are exceptionally strong, are made in moulds, have solid glass ribs on the inside, running vertically, forming passages through which the solution descends freely.

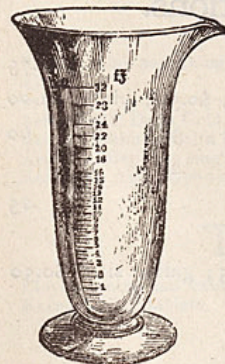
Size.	Each.
1/2 pint,	\$0.12
1/4 " . . . . .	.15
1 " . . . . .	.20
1 quart, . . . . .	.30
2 " . . . . .	.45



GRADUATES.

Our graduates are moulded, the scale being ground on the glass. The measurements are guaranteed perfectly accurate.

Size.	Each.
1 drachm,	\$0.20
1 oz., . . . . .	.15
2 " . . . . .	.20
3 oz., . . . . .	.25
4 " . . . . .	.30
6 " . . . . .	.35
8 oz., . . . . .	.40
16 " . . . . .	.70
32 "	1.00
2 " beaker, \$0.15; 4 oz. beaker, . . . . .	.20



Hydrometers for Silver Solution, single scale, packed in wooden cases, 38 cts. each
 Standard Thermometers, for testing temperature of solutions, 25 "
 " " in hard rubber case (pocket size), 50 "

Dark-room Accessories.

RUBBER GLOVES AND APRONS.

Just the thing to keep Silver or Pyrogallic Acid off the Hands.

Sizes, ladies' long, Nos. 6, 7, 8, and 9, corresponding approximately to kid glove sizes 5 1/2, 6, 6 1/2, and 7, per pair,	\$1.50
Sizes, ladies' short, Nos. 6, 7, 8, and 9, per pair,	1.35
Sizes, men's long, Nos. 10, 11, 12, 13, 14, and 15, corresponding approximately to kid glove sizes 7 1/2, 7 3/4, 8, 8 1/2, 8 3/4, and 8 1/2 or 9, per pair,	1.65
Sizes, men's short, Nos. 10, 11, 12, 13, 14, and 15, per pair,	1.35
Rubber aprons,	

PURE RUBBER FINGER TIPS.

Specially made for Photo Use.

The only economical means ever offered against the discoloration of nails and fingers from acids and chemicals. A great improvement over the expensive and clumsy glove, as they do not impair the sense of touch, but rather increase it. Very easily applied or removed.

Per set of three, \$0.15

VELVET RUBBER SQUEEGEES.

6 inches,	each, \$0.40
8 inches,	" .50
12 inches,	" .75

PLATE LIFTERS.

Efficient lifters,	\$0.15
L. Plate Lifters, . . . . .	.20
Russell negative clasp and drying support, . . . . .	.15

LOCKWOOD CLIPS.

3 in. long, 5/8 open, per dozen,	\$0.50
2 1/2 in. long, 3/8 open, per dozen, . . . . .	.45

INCANDESCENT RUBY ELECTRIC LAMPS.

For Dark Rooms.

These lamps are a deep ruby color and very safe. They are made *tipless*, which prevents the escape of white light from the tip, this being the universal defect in all ordinary lamps which are tipped. In ordering, specify candle power and voltage required, and kind of socket you use.

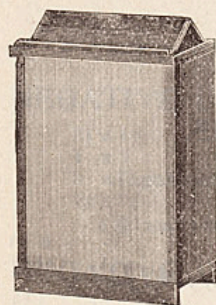
8, 10, or 16 candle power for 52, 104, or 220 volt current, to fit T.-H., Edison, Westinghouse, etc., sockets.

Price, \$1.00

ADJUSTABLE NEGATIVE WASHING RACK.

This negative rack is made entirely of metal, and is fastened at the joints with rivets, which allows it to be opened or closed, to take any size negative desired. The joints are held in place, after being opened to the proper size, by set screws at either end.

Price, each, \$1.50



The Lloyd Metal Candle Lamp.

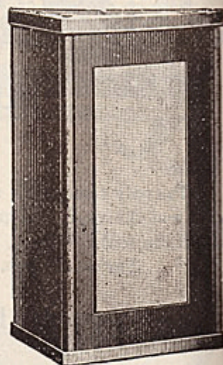
A new, compact, candle lantern, made of tin, neatly lacquered and provided with a safety shield, where the ruby glass slides in. These lamps all use the large candle, in which the paraffine is enclosed in a paper cup, so that the melted paraffine does not run over the sides, but falls in again toward the centre, making them both economical and clean.

Price, \$0.25

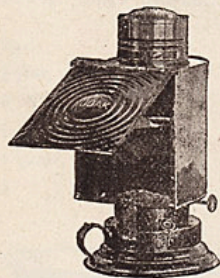
The Lloyd Compact Metal Ruby Lamp.

This is a candle lamp which folds into a box measuring $4\frac{1}{4} \times 7\frac{1}{2} \times 1\frac{1}{4}$ inches. The light opening is covered with both ruby fabric and orange paper, and therefore gives good illumination, which is also perfectly safe.

The entire lamp, excepting only the light opening, is made of metal, thus avoiding the great danger attending the use of similar styles made of cloth-covered pasteboard and wood. We believe this to be **the best, the safest, and the cheapest folding candle lamp** ever produced, and as such must commend itself to amateurs and all tourist photographers. Price, \$0.50.



Eastman's Kodak Dark-room Lamps.



This lamp is well made and safe. It is equipped with improved burner carrying extra broad wick, and has new ventilating top, insuring a bright, steady flame. It is the safest dark-room lamp made, being fitted with both ruby and orange glass. The flame can be controlled from the outside, and it is fitted with adjustable shield to protect the eyes from light and throw it directly on the work.

No. 1. Improved Kodak Dark-room Lamps, one-inch wick, each, \$1.50
 No. 2. " " " " $\frac{3}{4}$ -inch " " 1.00

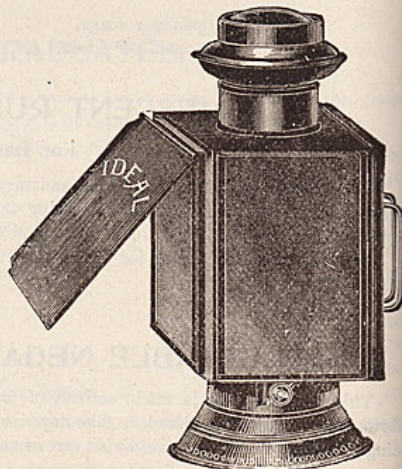
Ideal Lantern.

There are three sides for light, each of which has a double glass, one sheet each orange and ruby, which combination makes a perfectly safe light.

The front side is provided with a shield to protect the eyes, and also to reflect the light down toward the developing tray. It also has a silvered reflector, thus increasing the volume of light.

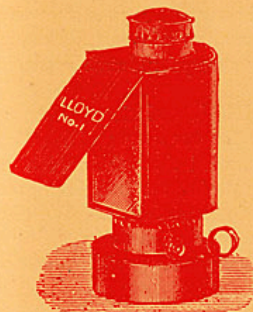
If desired, one side may be used for making transparencies, or for printing with bromide paper, by using a sheet of ground glass in place of the orange and a tin slide or shield in place of the ruby.

Price, \$3.00

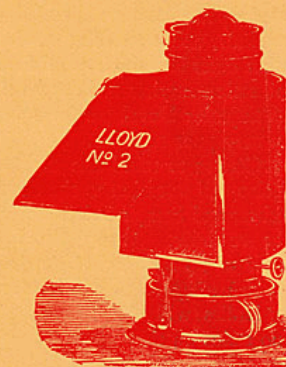


The LLOYD DARK ROOM LANTERNS

*The Best Lamp for the Money.
 Every one Guaranteed Perfect.*



No. 1, \$0.80



No. 2, \$1.00

*These Lanterns fill every
 Requirement of the Amateur.*

The ventilation is perfect, and the volume of light ample for the purposes of the ordinary worker. Made in two sizes,—No. 1, small, and No. 2, large. The small lantern has single ruby glass; while the larger size has combination of ruby and orange glass, for use singly or together, as in case of ortho-plates. Both lamps are fitted with broad wicks, and are regulated from the outside. Handsomely finished in red lacquer, leaving little to be desired.

Lloyd's Prepared Developers

AS interest in photography grows, and amateurs' skill increases, more and more people turn their attention to developing their own negatives. Hence the demand for reliable prepared developers.

Readers of our catalogue will observe that none of those articles which are advertised at prices so cheap as at once to arouse suspicion are listed in our pages. The reason is that developers quoted at manifestly absurd prices are not wholly to be depended upon. Expert knowledge to select the best formulæ, practised skill to mix the materials, and a sound reputation for using only chemicals of approved quality, are items that enter into the cost of developers. Of course, if one wishes to mix together a lot of stale materials and drown them with excessive quantities of water, he can put up "A Superior Developer for 13 cents," which will pay a very handsome profit, but make a very poor negative.

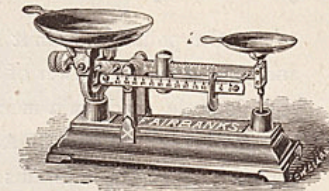
Calling to mind the difference between good and bad, and the reasons, we would also call attention to the developers prepared by us for our own trade. Only the freshest and best materials are used. They are compounded skilfully from the best formulæ we know. We have sold great quantities of them during the past three years, and know of no instance where they have not given complete satisfaction. We guarantee each package, and will immediately refund to any dissatisfied customer.

Ladies will like Trenol, Eikonogen, and Hydroquinone especially, as they leave no stains on the fingers.

PRICE LIST.

	8 oz.	16 oz.		
Lloyd's Trenol,	\$0.30	\$0.55	⬜	Lloyd's Eikonogen Powders, . . . \$0.25
Lloyd's Hydroquinone,	.30	.55	⬜	Lloyd's Hydro-Eiko Powders,25
Lloyd's Eikonogen,	.30	.55	⬜	Lloyd's Metol Hydro Powders,25
Lloyd's Metol,	.35	—	⬜	Lloyd's Ortol Powders,25
Lloyd's Ortol,	.35	—	⬜	Lloyd's Reducing Powders,25
Lloyd's Hydriko, two 8-oz. bottles, No. 1 and No. 2,	.50		⬜	Lloyd's Intensifying Powders,25
Lloyd's Metol Hydro, two 8-oz. bottles, No. 1 and No. 2,	.50		⬜	
Lloyd's Pyro Soda, two 8-oz. bottles, No. 1 and No. 2,	.50		⬜	Lloyd's Toning and Fixing Solution (Rayon), \$0.35 \$0.50
Lloyd's Intensifiers, two 8-oz. bottles, per pair,	.50		⬜	Lloyd's Fixing Salts, large size, .25 small, .10
Lloyd's Trenol Powders,	\$.25		⬜	Lloyd's Toning and Fixing Powders,25
Lloyd's Pyro Powders,	.25		⬜	
Lloyd's Hydroquinone Powders,	.25		⬜	Lloyd's Vignetting Paste, . . \$0.60
				Lloyd's Retouching Varnish, . . .25

Photographic Scales.

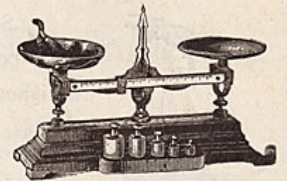


This new scale has been especially constructed to cover the whole range of ordinary photographic work. It really combines in one the two scales heretofore needed by photographers. The small pan and light beam weigh from 1 to 60 grains, while the large pan and beam weigh from $\frac{1}{4}$ to 8 ounces. The beams and pans are nickel-plated.

No. 3025. Movable pans, $4\frac{1}{4}$ and $2\frac{1}{2}$ in. in diameter, \$10.00

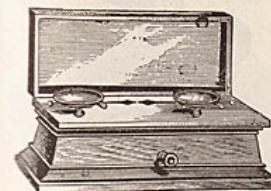
Dispensing Scales.

Handsomely designed scale for rough prescription and photographic work; has $3\frac{3}{4}$ -inch nickel-plated, movable pans; a side beam in front of scale with a sliding weight (this beam is divided into 120 divisions, each representing 1 grain; an extra row of metric divisions is placed on bottom edge of beam, each representing 1 decigram.) Platform or shelf is attached to base of scale, in which are fitted a set of solid brass weights, 2 ounces and down. Scale sensible to $\frac{1}{2}$ grain.



No. 6. Diameter of pans, $3\frac{1}{4}$ in. Capacity, 4 oz. Price, \$8.00

Eureka Prescription Scale.

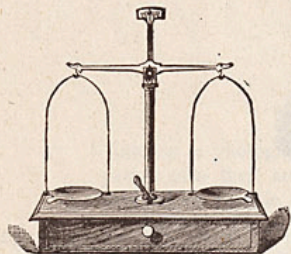


Cherry box, with marble top and hinged glass cover. Guaranteed accurate.

Each, \$12.50

Photographic Scales.

Army Prescription Scales.

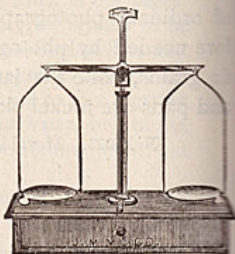


On polished walnut box. Scales take apart and pack away in drawer of box. A well-finished and reliable scale, made in a mechanical way, well adapted for physicians' offices. A full set of weights included. Weights, 2 drams to $\frac{1}{2}$ grain. $5\frac{3}{4}$ -inch beam.

Each, \$3.25

A scale similar to the above described, not so highly finished. 6-inch beam.

Each, \$2.50



Hand and Pocket Scales.



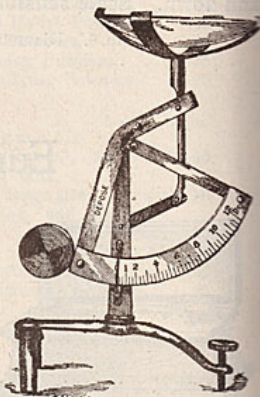
Scales come packed in a neat box, which may be carried in the pocket. They have steel beams and brass pans, and are furnished with a set of weights up to

8-in. beam, for grains, scruples, drams, and ounces,	\$1.50
6 " " " drams and grains,	.75
5 " " " " " " " " " " " "	.60

Déposé Scale.

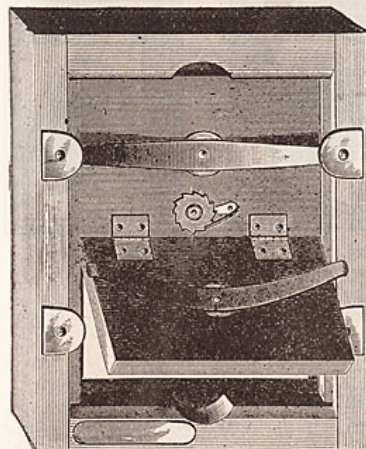
A marvel of neatness and compactness, consisting of a brass stand and frame, with glass chemical pan. The graduated scale is made of steel, and the capacity of the scale is from 1 grain to 12 drams.

Price,	\$1.00
Grain weights, $\frac{1}{4}$ to 5 grains, aluminum, per set,	.60
" " square, $\frac{1}{4}$ to 10 grains, aluminum, per set,	.60
" " coin shape, 2 drams to $\frac{1}{4}$ grain, per set,	.60



Improved Printing Frames.

These printing frames have been greatly improved by the placing of a washer under the spring, thereby saving the wear and tear of the wood-work, and the springs are fastened with rivets instead of screws. A tongue and groove are fitted into the back of frame where the two parts are hinged, preventing the entrance of any light. There has also recently been added a spring tally for recording the number of prints made (see cut). A celluloid tablet is recessed into each frame, constituting an admirable means for recording details of negative and of printing. Being recessed, the tablet is out of the way; and no erasure of the notes is possible, unless desired. The celluloid takes the pencil easily, and marks are readily washed off.



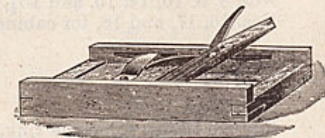
Size.	Flat.	Deep.	Size.	Flat.	Deep.
3 $\frac{1}{2}$ x 4 $\frac{1}{2}$,	\$0.36	—	11 x 14,	\$1.80	\$2.40
4 x 5,	.38	—	14 x 17,	2.40	3.00
4 $\frac{1}{2}$ x 5 $\frac{1}{2}$,	.40	—	15 x 20,	3.00	4.20
4 $\frac{1}{2}$ x 6 $\frac{1}{2}$,	.42	—	17 x 20,	3.00	4.50
5 x 7,	.50	—	18 x 22,	4.00	5.00
5 x 8,	.52	—	20 x 24,	5.00	5.25
6 $\frac{1}{2}$ x 8 $\frac{1}{2}$,	.60	\$1.20	24 x 30,	—	8.80
8 x 10,	.75	1.40	35 x 45,	—	15.00
10 x 12,	1.00	1.60	30 x 60,	—	20.00

When the backs open lengthwise, 10 per cent. additional is charged.

Ray Printing Frame.

This frame is made of best seasoned cherry, and springs of best spring brass. It is designed principally for the amateur's use. It is light and strong.

Size, 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$,	Price, \$0.25	Size, 3 $\frac{1}{2}$ x 4 $\frac{1}{2}$,	Price, \$0.25
" 3 $\frac{1}{2}$ x 3 $\frac{1}{2}$,	" .25	" 4 $\frac{1}{2}$ x 4 $\frac{1}{2}$,	" .25
		" 4 x 5,	" .25



Leigh's Combination Photograph Printing Frame.



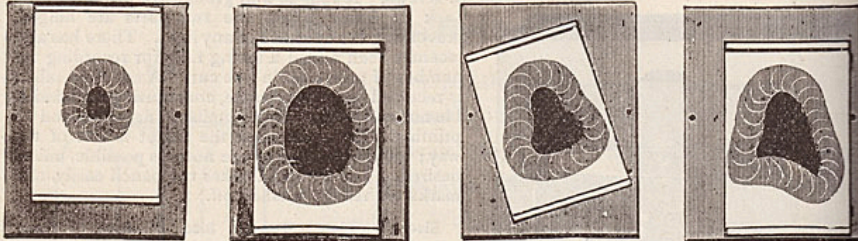
By means of this frame it is possible to make several prints from different negatives on the same piece of paper for combination printing. By the use of this we print from the full-sized negative, and are not obliged to cut up and spoil the negatives, thus often ruining them for future orders for single cabinets. Prints ten inches to ten feet in length may be made if desired. Two styles are made, one taking rolls for the narrow dimension and one for the wider way.

PRICE, FOR EITHER STYLE, COMPLETE.

4 $\frac{1}{2}$ x 6 $\frac{1}{2}$,	\$2.25
5 x 7,	2.50
5 x 8,	2.50
6 $\frac{1}{2}$ x 8 $\frac{1}{2}$,	\$3.00
8 x 10,	3.50
11 x 14,	5.00

The Dixie Vignetter.

The First and Only Successful Adjustable Vignetter.



Size.	Each	Per Doz.	Size.	Each.	Per Doz.
3 1/2 x 4 1/2	\$0.20	\$3.50	5 x 8	\$0.30	\$3.50
4 x 5	.30	3.50	6 1/2 x 8 1/2	.45	5.00
4 1/2 x 6 1/2	.30	3.50	8 x 10	.60	7.00
4 3/4 x 6 3/4	.30	3.50	10 x 12	.75	9.00
5 x 7	.30	3.50			

Sample by mail, postpaid, 10 cts. additional.

WAYMOUTH'S VIGNETTE PAPERS.

Envelopes, containing one each, No. 1 to No. 15,	\$1.00
Nos. 1, 2, 3, 4, and 5, for Cartes,	per doz., .50
Nos. 6, 7, 11, 12, and 13, for large Cartes and Victorias,	" " .75
Nos. 8, 9, 10, 14, 15, and 15 1/2, for cabinets and 4 x 4,	1.00
Nos. 16, 17, and 18, for cabinet and half-size,	1.25

PAPERS.

Post-office,	per doz., \$0.25	
English tissue, for vignetting,	" " .20	
Blotting, heavy and World, per doz., \$0.60; light,	" " .30	
Filter, per package of 100 sheets:		
No. 19. 7 1/2 in., \$0.30	No. 33. 13 in., \$0.62	No. 45. 18 in., \$1.00
" 25. 10 " .38	" 40. 16 " .82	" 50. 19 1/2 " 1.20
Albumen, extra brilliant and second choice:		
N. P. A., Eagle, Lion, S. & M., and others, \$1.20	Per doz. \$11.50	Per 1/2 ream. \$22.00
Litmus,	per vial of 100, \$0.10; per book, \$0.05	Per ream. \$42.00

COLLODION.

Anthony's New Negative, Negative, New Ferrottype, Anthony's Positive, 1/4 lb., \$0.65

COTTONS.

Anthony's Negative, Nos. 1 and 2 Soluble, Positive, Glacé,	per oz., \$0.50
" Snowy,	" " 1.00
" Climax,	" " .75

FOCUSING CLOTHS.

Good quality, rubber-coated, per sq. yd., \$0.50

RUBY AND ORANGE FABRIC.

For dark rooms, per sq. yd., \$0.60

PRINTING FRAME EASELS.

Takes frames, from 3 1/2 x 4 1/2 to 10 x 12, each, \$0.25

Printing Out Papers.

GELATINE.

SOLIO, ALBUMA AND KLORO.

Subject to change without notice.

Size.	Half Dozen.	Dozen.	Half Gross.	Gross.
3 1/2 x 3 1/2	2 doz., \$0.20			\$1.15
*3 1/2 x 4	2 " .20			1.15
3 1/4 x 4 1/4	2 " .20			1.15
4 x 5	2 " .25			1.25
2 1/4 x 3 3/4 (Carte-de-V.)	2 " .20			1.00
3 x 4 (Mantello)	2 " .20			1.00
3 7/8 x 5 1/2 (Cabinet)	.20			1.35
*3 7/8 x 5 7/8	.20			1.50
4 x 6	.20			1.60
5 x 7	.30	\$1.60		2.65
5 x 8	.30	1.75		3.00
5 1/2 x 7 3/4	.50	1.90		3.25
6 x 8	.40	2.25		4.00
6 1/2 x 8 1/2	.45	2.40		4.25
7 x 9	.50	2.75		5.00
8 x 10	.60	3.50		6.50
10 x 12	.90	5.25		10.00
11 x 14	1.20	7.00		13.00
14 x 17	1.80	10.50		20.00
*16 x 20	\$1.25	2.40	14.00	27.00
*18 x 22	1.60	3.00	17.50	34.00
20 x 24	1.85	3.50	20.50	40.00

Cabinet Seconds \$1.10 per gross.

4 x 5 " (trimmed) 1.00 " "

10-yard roll, 26 in. wide, untrimmed, \$4.50. 5-yard roll, do., \$2.50

10-foot roll, do., \$1.75

The above prices are net.

*These sizes are no longer on the regular list, but will be furnished on special orders.

Printing Out Papers.

COLLODION.

ATLAS, AND ARISTO, Jr.

Subject to change without notice.

Size.	Dozen.	Half Gross.	Gross.
3½ x 3½	2 dozen, \$0.25		\$1.25
3½ x 4	2 "	.25	1.25
3¼ x 4¼	2 "	.25	1.25
4 x 4	2 "	.25	1.25
4 x 5		.15	\$0.75 1.35
4¼ x 5½		.20	1.75
2¼ x 3¾ (Carte-de-V.)		.15	1.00
3 x 4 (Mantello)		.15	1.00
3⅞ x 5½ (Cabinet)		.20	1.60
3⅞ x 5⅞ "		.20	1.60
4 x 6		.20	1.60
5 x 7		.30	1.60 2.65
5 x 8		.30	1.75 3.00
5½ x 7¾		.35	1.90 3.25
6½ x 8½		.45	2.40 4.25
7 x 9		.50	2.75 5.00
8 x 10		.60	3.50 6.50
10 x 12		.90	5.25 10.00
11 x 14		1.20	7.00 13.00
14 x 17		1.80	10.50 20.00
16 x 20		2.40	14.00 27.00
18 x 22		3.00	17.50 34.00
20 x 24		3.50	20.50 40.00

10-yard rolls	\$4.50
5-yard rolls	2.50
10-foot rolls	1.75
Cabinet Seconds	1.20 (per gross)

NOTE.—Half-dozen packages in following sizes only: 11 x 14, 65 cents; 14 x 17, 95 cents; 16 x 20, \$1.25; 18 x 22, \$1.60; 20 x 24, \$1.85.

The above prices are net.

Printing Out Papers.

COLLODION MATT.

ARISTO PLATINO, AND DELTA MATT.

Subject to change without notice.

Size.	Dozen.	Half Gross.	Gross.
3½ x 3½	2 dozen, \$0.30		\$1.50
3½ x 4	2 "	.30	1.50
3¼ x 4¼	2 "	.30	1.50
4 x 5		.20	\$0.90 1.65
4¼ x 5½		.25	2.10
2¼ x 3¾ (Carte-de-V.)		.20	1.20
3 x 4 (Mantello)		.20	1.20
3⅞ x 5½ (Cabinet)		.25	2.00
3⅞ x 5⅞ "		.25	2.00
4 x 6		.30	2.25
5 x 7		.35	1.95 3.20
5 x 8		.40	2.10 3.60
5½ x 7¾		.45	2.30 4.00
6½ x 8½		.55	2.90 5.10
7 x 9		.60	3.30 6.00
8 x 10		.75	4.20 7.80
10 x 12		1.10	6.30 12.00
11 x 14		1.45	8.40 15.60
14 x 17		2.20	12.60 24.00
16 x 20		2.90	16.80 32.40
18 x 22		3.60	21.00 40.80
20 x 24		4.20	24.60 48.00

Cabinet Seconds	\$1.60 per gross.
10-yard roll	.60 per yard.
5-yard roll	.65 per yard.

NOTE.—Half-dozen packages in following sizes only: 11 x 14, 75 cents; 14 x 17, \$1.15; 16 x 20, \$1.50; 18 x 22, \$1.90; 20 x 24, \$2.20.

The above prices are net.

Willis & Clements Platinum Papers.

Artistic photographers use Willis & Clements platinum paper for their finest black and white effects. It is remarkably simple, and requires no tedious washing, toning, and fixing, etc. The whole operation is complete in less than three-quarters of an hour. No hypo is used at any stage, which avoids all possibility of fading from that source. Willis & Clements prints are absolutely permanent, since the image consists of metallic platinum, which is the most stable metal known. Platinum prints will stand the action of all corrosive fluids except a boiling mixture of concentrated nitric and muriatic acids.

Two varieties, **Black and Sepia.**

In three grades:—

A. A., THIN SMOOTH.

B. B., HEAVY SMOOTH.

C. C., HEAVY ROUGH.

PRICE LISTS.

A. A. BLACK.	Per doz.	A. A., SEPIA. B. B., BLACK AND SEPIA. C. C., BLACK AND SEPIA.	Per doz.
3½ x 3½	\$0.30		\$0.30
3½ x 4½	.30		.30
4 x 5	.15		.50
3½ x 5½	.45		.55
4½ x 5½	.50		.60
4½ x 6½	.60		.70
5 x 7	.70		.80
5 x 8	.85		.95
5½ x 7½	1.00		1.25
6½ x 8½	1.15		1.25
8 x 10	1.70		1.85
10 x 12	2.50		2.80
11 x 14	3.40		3.75
14 x 17	5.25		6.00
16 x 20	6.75		7.00
20 x 26	9.00		10.00
Rolls, 20 in. by 26 ft.,	9.00		10.00
Rolls, 20 in. by 52 ft.,	18.00		—

Developer for 16 oz. solution, . . . \$0.15; 50 oz., \$0.35; 100 oz., \$0.60.
 Sepia solution, 2 oz.,15; 4 oz., .25; 10 oz., .50.

**COLLEGE-ROOM
DECORATION**

OPTO

**THE QUICK
PRINTING
BLUE PRINT
PAPER**

TRY IT

CROCKER

OPTO QUICK-PRINTING BLUE PAPER.



Our experience with OPTO has fully justified the claim we made for it in 1898, as a Blue Print Paper of unsurpassed quality, yielding the finest effects possible in photography.

We repeat all that we said then regarding the care with which OPTO is made from first to last: the raw stock is the finest obtainable; all pains are taken to secure the best atmospheric conditions at every stage of manufacture; and, finally, OPTO is securely put up in tins carefully sealed, instead of in paper packages, as formerly.

We have sent this fine Blue Print Paper to every part of the Union, to Cuba, Porto Rico, and South America, and are assured that it gives general satisfaction.

It is a special favorite of amateurs. Every one knows the rich, cheery effect of the Blue Prints so much in vogue in college rooms, with their fine contrasts and gay coloring. It is this that our artist has illustrated.

OPTO is a very rapidly worked paper. The manipulation is very simple and sure. The beginner will get the "hang" of it in a surprisingly short time, and will quickly acquire expertness.

To confirm its popularity and to add an incentive for still wider use, prices are kept very low.

PRICE LIST.

Delivered by mail, postage paid, on receipt of price.

	Per package of 25 sheets.		Per package of 25 sheets.
2 1/2 x 2 1/2	\$0.14	5 x 8	\$0.40
3 1/4 x 4 1/4 . . . . .	.16	6 1/2 x 8 1/2 . . . . .	.56
3 1/2 x 3 1/2 . . . . .	.16	8 x 10 . . . . .	.68
4 x 4 . . . . .	.20	10 x 12	1.00
4 x 5 . . . . .	.20	11 x 14	1.50
4 1/4 x 6 1/2 . . . . .	.30	14 x 17	2.00
5 x 7 . . . . .	.35		

18 x 22, per dozen, \$1.50
20 x 24, " " 1.75

Bradley Platinum Papers.

J. Smooth surface paper.
B. Heavy paper, slightly rough.
S. B. Heavy smooth paper.

PRICE LIST.

Size.	Per doz.	Only following sizes sold in gross lots.
3 1/4 x 3 1/4	\$0.20	—
3 1/4 x 4 1/4 . . . . .	.20	—
4 x 5 . . . . .	.30	Per gross.
3 1/2 x 5 1/2, CABINET, . . . . .	.35	\$3.25
4 x 6 . . . . .	.40	3.50
4 1/2 x 6 1/2 . . . . .	.45	—
5 x 7 . . . . .	.50	—
5 x 8 . . . . .	.65	—
6 1/2 x 8 1/2 . . . . .	.90	—
8 x 10	1.35	—
10 x 12	2.00	—
11 x 14	3.00	—
14 x 17	4.75	—
16 x 20	6.00	Per sheet tube extra.
20 x 26	8.00	67 cents.
In roll 26 feet long, 20 inches wide,		\$8.00
Developer, sufficient for 30 oz. solution, . . . . .		.30
Developer, sufficient for 5 doz. prints, . . . . .		.10

French Satin, Jr.

Blue Print Paper.

PRICE LIST.

Size.	Per package of 25 sheets.
3 1/4 x 4 1/4	\$0.16
3 1/4 x 3 1/2 . . . . .	.16
4 x 4 . . . . .	.20
4 x 5 . . . . .	.20
4 1/2 x 6 1/2 . . . . .	.30
5 x 7 . . . . .	.35
5 x 8 . . . . .	.40
6 1/2 x 8 1/2 . . . . .	.56
8 x 10 . . . . .	.68
10 x 12	1.00
11 x 14	1.50
14 x 17	2.00
18 x 22	per doz., 1.50
20 x 24	" " 1.75

Platni Paper.

Prints black and white, and is developed by water, just like the blue papers.

PLATNI LIST.

Size.	per doz.,	Size.	per doz.,
3 1/4 x 3 1/4	\$0.20	5 x 8	\$0.55
4 x 5 . . . . .	.30	6 1/2 x 8 1/2 . . . . .	.75
3 1/2 x 5 1/2 . . . . .	.30	8 x 10	1.10
4 x 6 . . . . .	.30	Per yard, 26 inches wide,	1.00
5 x 7 . . . . .	.50		

Eastman's Bromide Papers.

List and description of the various kinds and statement of use to which each is best adapted.

Each of the various kinds and grades of bromide papers named below is made in two varieties of emulsion:—

HARD.—Strong contrast, for use with soft or flat negatives.
SOFT.—Soft and rapid, for use with strong or hard negatives.

Standard Bromide Paper is a natural surface bromide paper, which is especially adapted for all kinds of enlargements, particularly copies on which crayon or pastel work is to be done.

The emulsion is coated on three different weights of paper,—A, thin smooth; B, heavy smooth; C, heavy rough.

The A, thin smooth, should be used for contact prints or small enlargements which are to be spotted or finished in India ink or water colors.

The B, heavy smooth, should be used for large enlargements which are to be spotted or finished in water colors, India ink, or oil.

The C, heavy rough, is best adapted for large work which is to be finished in crayon or pastel. It can also be finished in India ink, water colors, or oil.

Platino Bromide Paper gives results so near like Platinum that the difference, if any, would be difficult to detect. It has a fine surface, and is best adapted for contact prints and enlargements from life negatives.

This is made in two weights of paper,—A, thin smooth; C, heavy rough.

The A, thin smooth, should be used for contact prints or small enlargements which are to be spotted or finished in India ink or water colors.

The C, heavy rough, is intended for large enlargements which are to be spotted or finished in crayon or pastel, India ink, water colors, or oil.

It is not expected that Platino or Standard Bromide will be used when sepia tones are wanted.

Matte-enamel Bromide Paper.—Rich carbon blacks and a smooth velvety mat surface tinted just enough to lend warmth to the high lights and half-tones, giving with Matte-enamel an effect not heretofore obtained with bromide papers. When used with life negatives, enlargements can be made that closely resemble mat contact prints.

This paper gives excellent sepia tones, and is especially recommended for enlargements 16 x 20 and under, when it is desired to make prints ready for delivery by simply spotting. It is furnished on medium weight paper only. Its fine grain gives an excellent tooth on which to work crayon and pastel. It can also be finished in India ink, water colors, or oil. Try this paper on solid prints from life negatives made for mat surface work.

Enamelled Bromide Paper.—A glossy bromide paper, which, when used with life negatives, gives enlargements which closely resemble glossy contact prints. It gives excellent sepia tones, and can be finished in water colors washed in or with the air brush. When squeegeed to ferrotype plate, it gives a gloss which is fully equal to that produced by the glacé process. It is furnished on medium weight paper only.

Royal Bromide Paper.—A mat paper with rough texture for broad effects. May be toned a rich sepia in the hypo fixing bath, and prints made through silk give effects resembling rare old etchings.

PRICE LIST OF EASTMAN'S BROMIDE PAPERS.

Per doz.		Per doz.		Per doz.	
2½ x 3½	\$0.15	5 x 8	\$0.40	17 x 20	\$3.40
3 x 4	.15	5½ x 7½	.45	18 x 22	4.00
3½ x 4½	.15	6½ x 8½	.60	20 x 24	4.80
3¾ x 5¼	.25	7 x 9	.65	22 x 27	6.00
4 x 5	.25	8 x 10	.80	24 x 30	7.20
4 x 6	.25	10 x 12	1.20	25 x 30	7.50
4½ x 6½	.30	11 x 14	1.55	24 x 36	8.70
4¾ x 6¾	.35	12 x 15	1.80	30 x 40	12.00
5 x 7	.35	14 x 17	2.35	40 x 60	24.00
5 x 7½	.40	16 x 20	3.20	40 x 72	28.80

IN ROLLS.

Per yard.		Per yard.		Per yard.	
10 in. wide	\$0.30	18 in. wide	\$0.54	30 in. wide	\$0.90
11 " "	.33	20 " "	.60	31 " "	.93
12 " "	.36	22 " "	.66	41 " "	1.23
14 " "	.42	24 " "	.72	Not less than 10 yards on a spool.	
16 " "	.48	25 " "	.75		

In ordering, always specify whether Hard or Soft is wanted; and, if the Standard or Platino is to be ordered, state which grade of paper is desired.

VELOX PAPERS.

SIX GRADES:—

Carbon, Mat Surface,
 Glossy, Enamelled Surface, } For Contrasty Effects.
 Rough, Rough Surface,
 Special Portrait, Semi-mat Surface,
 Special Glossy, Enamelled Surface, } For Soft Effects.
 Special Rough, Rough Surface,

Size.	Doz.	VELOX. Gross.
2¼ x 3½	\$0.15	\$1.10
3 x 4	.15	1.25
3½ x 3½	.15	1.25
3¼ x 4¼	.20	1.60
3¾ x 5½ (Cabinet)	.25	2.00
4 x 5	.25	2.00
4¼ x 4¼	.25	2.00
4 x 6	.25	2.00
4¼ x 6½	.35	2.75
5 x 7	.40	3.50
5 x 8	.45	4.00
5½ x 7¾	.50	5.00
6 x 8	.55	5.50
6½ x 8½	.65	6.00
7 x 9	.75	7.00
8 x 10	.90	8.00
10 x 12	1.25	12.00
11 x 14	1.50	15.00
14 x 17	2.25	24.00
16 x 20	3.00	32.00
18 x 22	4.00	40.00
20 x 24	4.00	44.00
Seconds (Cabinets or 4 x 5)		1.20

One Sheet 25 in. x 10 ft., \$2.00.

This paper prints by artificial light or diffused daylight. It does not need a dark room, but may be developed under a low gas flame. Fixes in hypo just as a plate, after washing dries quickly. The permanency of Velox is unquestioned.

Full directions for working Velox will be found on pages 252 and 253.

Nepera Bromide Papers.

Platinoid, Enamelled, Rough.

SIZE.	DOZ.	GROSS.	SIZE.	DOZ.	GROSS.
2½ x 3½	.15	\$1.10	8 x 10	\$0.80	\$8.00
3 x 4 or 3½ x 3½	.15	1.25	10 x 12	1.20	—
3½ x 4½	.15	1.60	11 x 14	1.55	—
3¾ x 5½ (CABINET)	.25	2.00	14 x 17	2.35	—
4 x 5	.25	2.00	16 x 20	3.20	—
4 x 6	.30	—	18 x 22	4.00	—
4½ x 6½	.30	2.75	20 x 24	4.80	—
5 x 7	.35	—	22 x 27	6.00	—
5 x 8	.40	4.00	24 x 30	7.20	—
5½ x 7½	.50	—	25 x 30	7.50	—
6 x 8	.55	5.50	24 x 36	8.70	—
6½ x 8½	.60	6.00	30 x 40	12.00	—
7 x 9	.75	7.00			

BROMIDE, in rolls at least 10 yards long.

Width	Price per yard
10 inches wide	\$0.30
11 " "	.33
12 " "	.36
14 " "	.42
16 " "	.48
18 " "	.54
20 " "	.60
22 inches wide	\$0.66
24 " "	.72
25 " "	.75
35 " "	1.07
41 " "	1.23
54 " "	(only "Rough"), \$1.75

Dekko Paper.

A developing paper giving tones from blue black to olive green, and manipulated in a weak white light. Printed by gaslight or other artificial light.

Carbon Dekko. Cream tint, matte surface.

Plain Matte. White, same surface as matte printing-out papers.

Egg Shell Matte. Rough matte surface with slight sheen.

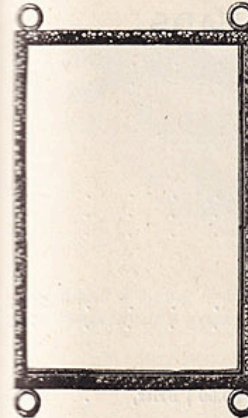
Rough Matte. For broad, sketchy effects.

PRICE.

SIZE.	DOZ.	GROSS.	SIZE.	DOZ.	GROSS.
2½ x 3½	.15	\$1.10	5 x 7	\$0.35	\$3.50
3 x 4	.15	1.25	5 x 8	.40	4.00
3½ x 3½	.15	1.25	5½ x 7½	.45	5.00
3½ x 4½	.20	1.60	6 x 8	.50	5.50
3¾ x 5½	.25	2.00	6½ x 8½	.60	6.00
4 x 5	.20	2.00	7 x 9	.65	7.00
4 x 6	.25	2.00	8 x 10	.80	8.00
4½ x 6½	.30	2.75			

Transparency and Lantern Slide Accessories.

Transparency Frames.



TRANSPARENCY FRAME.

Made in several styles. The plain frames have a detachable side, which is removed to introduce the transparency and secured by screws. Antiques are similar. Some are provided with two rings, some on sides, others on ends, for horizontal or vertical pictures. In ordering, style must be specified. Others have four rings: the two extra ones are easily removed by cutting pliers. They have little teeth which fold over and hold the plates in.

Price Lists.

Size.	4 x 5.	5 x 7.	5 x 8.	6½ x 8½.	8 x 10.
Plain, two rings, horizontal or vertical.	\$0.28	\$0.32	\$0.34	\$0.38	\$0.48
Plain, four rings.	.31	.35	.37	.42	.52
Antique, four rings.	.34	.37	.39	.45	.56
Zigzag.	.40	.46	.48	.53	.60

Etched Glass Mats for Transparency Frames.

6½ x 8½	each, \$0.33	8 x 10	each, \$0.42
11 x 14	each, \$0.70		

Ground, Ruby, Orange, and Green Glass.

4 x 5	per light, \$0.08	11 x 14	per light, \$0.40
5 x 7	.10	12 x 16	.50
5 x 8	.15	14 x 17	.70
6½ x 8½	.20	18 x 22	1.00
8 x 10	.25	20 x 24	1.25
10 x 12	.30	For Lloyd dark-room lanterns, cut to size, each, .10	

Lantern Slide Cover Glass.

3½ x 4, finest French (2 doz. in box)	per doz., \$0.25
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Mats for Lantern Slides.

Black, with gilt lines, in seven different size openings, oblong, circular, oval, etc.,	per 100, \$1.00
Boston mats, with 100 L. S. numbers, per 100, \$0.50	Olmstead mats, " .50

Lantern Slide Binders.

Extra quality, black,	per 100, \$0.20	Extra quality, white or black, rolls,	\$0.50
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Retouching and Spotting Materials.

RETOUCHING PENCILS AND LEADS.

Pencils, each,	\$0.10	Leads, half-dozen,	\$0.50
" per dozen,	1.00	Holder and one lead, . . . . .	.25
		India ink, per stick, \$0.20.	
		Litmus Pencils, each, .25.	

OPAQUE.

Lloyd's Vignetting Paste,	\$0.50
Gihon's Opaque, . . . . .	.50
McCollins' " . . . . .	.50

RETOUCHING FRAMES.

8 x 10 and under,	\$3.00
11 x 14 "	7.00

RETOUCHING FLUID.

Snell's,	\$0.25	Bordeaux,	\$0.50	A., P. & W.,	\$0.50	Fritz,	\$0.35
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VARNISHES.

Lloyd's Retouching Varnish,				\$0.25
Flint, Mountfort's, Adamantine,	6-oz. bottle, \$0.40;	pint, \$1.00;	quart, 1.50	
Diamond,	6 " " .35;	" 1.00;	" 1.75	
Crystal,	6 " " .30;	" .65;	" 1.10	
Weston's,	6 " " .40;	" 1.00;	" 1.75	
Phoenix Ferrottype,	8 " " .50;			
Ground glass substitute,			per bottle, .50	
Standard waterproof varnish,	2-oz. bottle, .25		6-oz., .50	

SPOTTING-OUT AND RETOUCHING COLORS.

Aristo spotting-out colors, 3 shades,	per set, \$0.50
Spurr's spotting-out and retouching colors, 4 shades,	" " .50
Talbot's spotting-out colors, 5 small tubes,	" " .75
" " " large size, 7 colors,	" " 3.00

STRAUSS MARL.

Is an invaluable aid to operator, printer, and retoucher. For working in shadows and backgrounds on the negative it has no equal. Invaluable for blocking out and vignetting. Far superior to any opaque. Sold in glass jars with metal screw top.
Price, per jar, \$1.00

THE PHOTOSCRIPT.

Is an ingenious apparatus by means of which the operator may title and number his negatives in plain type, with little or no trouble, directly on the film surface. The letters and numbers so produced are clean cut and white, and may be put in any corner or margin desired.
Price, \$3.75

BRUSHES.

Red Sable Pencil Brushes.

Nos. 1, 2, and 3, each,	\$0.10
" 4 and 5, " . . . . .	.12
No. 6, " . . . . .	.15
Nos. 7 and 8, " . . . . .	.20
" 9 and 10, " . . . . .	.25
" 11 and 12, " . . . . .	.30

Flat Camel's-hair Dusters.

1 - inch,	\$0.20	2½-inch,	\$0.50
1½ " . . . . .	.30	3 " " . . . . .	.60
2 " . . . . .	.40		

Flat Paste Brushes.

1 - inch,	\$0.12	2½-inch,	\$0.30
1½ " . . . . .	.20	3 " " . . . . .	.40
2 " . . . . .	.25		

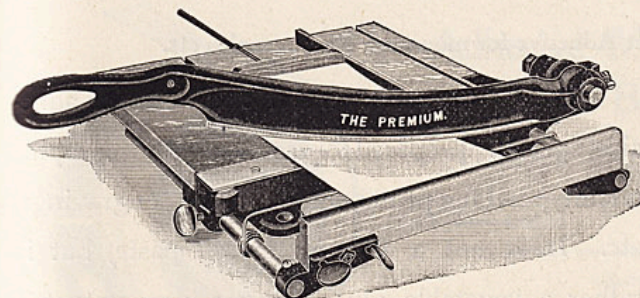
Rubber-bound Paste Brushes.

1 - inch,	\$0.20	2½-inch,	\$0.45
1½ " . . . . .	.25	3 " " . . . . .	.50
2 " . . . . .	.35		

Rubber-bound Camel's-hair Brushes.

1 - inch,	\$0.38	2½-inch,	\$0.85
1½ " . . . . .	.57	3 " "	1.25
2 " . . . . .	.75		

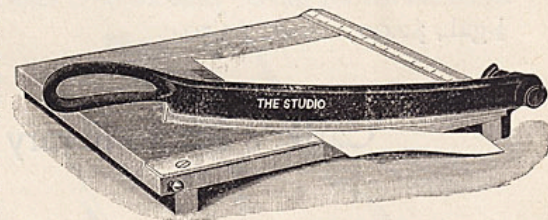
Premium Card Cutter.



THIS is the popular, general, all round machine, with a twelve-inch blade, meeting the requirements of a medium-sized cutter. A distinctive advantage is secured by a peculiar arrangement of the joint, by means of which a sheet of any length may be cut. By the simple

adaptation of a spring overhead connected by a cord attached to the handle, the cutter is adapted to rapid work where a great number of small pieces of uniform size are to be cut. Price, \$10.00.

Studio Cutter.



THIS cutter has a ten-inch blade, and is suited to a class of work lighter than that done by the Premium, but which demands greater capacity than the Dandy affords.

It is well adapted for trimming photographic prints from ten inches down, and is a very desirable machine for the money.

Price, \$3.00.

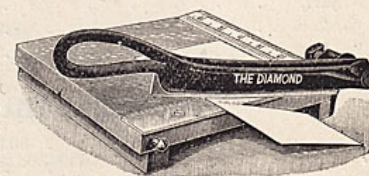
Dandy Photo Trimmer.



If you are included among the great number of amateur photographers, you will be interested in the Dandy cutter, or trimmer, as many prefer to call it. The table is eight inches square, and has a graduated back gauge. The movable blade is curved, giving a drawing cut, so essential to smooth work.

The efficiency of the machine is increased by the combination of the curved movable blade and the peculiar construction of its pivotal spring joint, which allows the blade a slight lateral motion, and thus secures perfect contact of the two blades at every point. Price, \$2.00.

Diamond Photo Trimmer.



THIS is practically a smaller edition of the Dandy trimmer, and is made to meet the demand for a still lower-priced cutter. The blade is 6 inches in length. Price, \$1.25.

Higgins's Photo-mounter.

A Perfect Adhesive for mounting Photographs, etc.

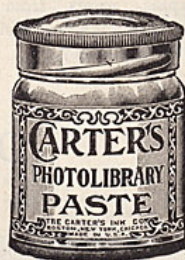
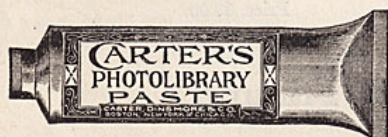


This is an entirely novel and superior adhesive, specially prepared for mounting photographs, aristotypes, blue prints, scrap pictures, engravings, etc. It is not a flour or starch paste, but is rather a vegetable glue, being a new patented discovery in the chemistry of adhesives.

PRICES.

In screw-capped jars, 3-oz., \$0.15; 6-oz., \$0.25; 14-oz., \$0.50; ½-gal., \$2.00; 1-gal., \$3.50.

Carter's Photo-library Paste.



4-oz. jar,	\$0.15
7 " " . . . . .	.25
16 " " . . . . .	.50
3 " tube, . . . . .	.10
1½ " " . . . . .	.05

Kollos.

2-oz. collapsible jars,	\$0.10	Pint bottles,	\$0.75
3 " jars, . . . . .	.15	Quart "	1.25
6 " " . . . . .	.25	Half-gallon bottles,	2.00
14 " " . . . . .	.50	Gallon "	3.50

Mitchell's Anti-cockling Solution.

4 oz.,	\$0.30	Quarts,	\$1.50
8 " . . . . .	.50	Half-gallons,	2.75
Pints, . . . . .	.85	Gallons,	5.00

SETON

Adhesive Mounting and Binding Tape.

GRAY AND WHITE.



Binds passe-partouts.
Repairs and binds blue prints.
Mends books, plans, documents.
Sticks card mounts together, into albums.
Price, per 100 feet, \$0.50

Circular and Oval Cut Outs.

For Circo, Uniola, and Other Oval Mounts. Ovals are All the Rage.

Forms. Polished Brass.

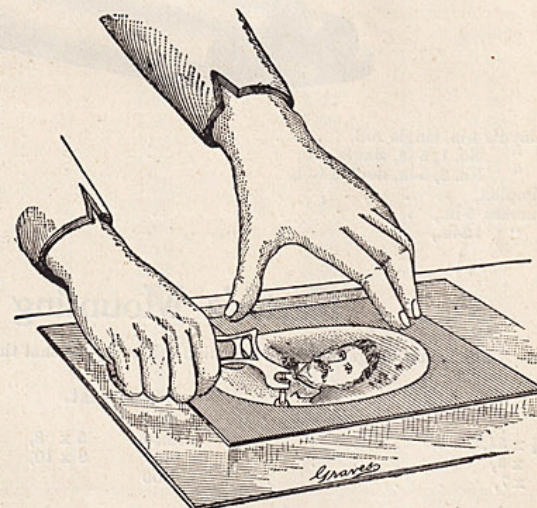
Each.	
All * regular size circles,	\$0.50
All * regular size ovals, . . . . .	.80
Revolving cutter, . . . . .	.30
Brass cut outs, for lantern slide mats, to order only,	1.25
* As per numbers below.	

Special Sizes. To order only.

Each.	
Circles, not exceeding 5 inches in diameter,	\$0.75
Ovals, not exceeding 5 inches in length,	1.50
Special quotations on larger sizes.	

Outfits, consisting of Form and Cutter.

Circle.	
Size of Form.	Each.
No. 101, or Circo A, 2¼ in.,	\$0.75
" 193, . . . . .	.75
" 534 or 535, 3 " . . . . .	.75
Circo B, . . . . .	.75



Oval.		
Nos. 181, 195, 536, 537, 546, or 549,	Size of Form.	Each.
" 182, 194, 523, 538, or 547,	3 1/8 x 4 1/8 in.,	\$1.00
" 522, 531, or 532,	3 1/4 x 5 "	1.00
No. 548,	2 x 2 1/4 "	1.00
	3 1/4 x 5 1/4 "	1.00

NOTE.—The numbers correspond to A. M. Collins Mfg. Co.'s mounts.

Glass Forms.

2½ x 2½, \$0.25.	3½ x 4½, \$0.25.	5 x 7, \$0.50.	6½ x 8½, \$0.75.
3½ x 3½, \$0.25.	4 x 5, \$0.30.	5 x 8, \$0.60.	
Card size, \$0.30. Mantello size, \$0.25. Cabinet size, \$0.40. Circles: 3½-in. diameter, 4-in. diameter, \$0.40.			
Special sizes to order at short notice.			

Wheel Print Trimmers.

Straight cut trimmer,	\$0.20	Swivel trimmer,	\$0.30
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Mounting Accessories.

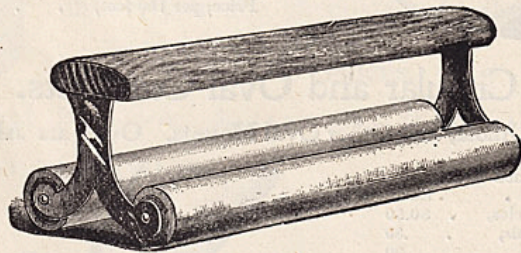
Ferrotypes and Squeegee Plates.

	Each.	Dozen.
10 x 14, light,	\$0.15	\$1.25
10 x 14, heavy,25	2.00
14 x 20, heavy,	1.00	5.00

Squeegees.

6-in.	\$0.40	8-in.	\$0.50	12-in.	\$0.75
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Print Mounters.



Lloyd's 4-in. single roll,	\$0.25
" No. 1, 6-in. single roll,45
" No. 2, 6-in. double roll,50
Simplex, . . . . .	.50
Success, 6-in.,	1.00
" 12-in.,	1.50

Carter's Mounting Pads,

For mounting gelatine and collodion prints dry, so that the mount will not curl nor cockle.

Price List.

3½ x 3½,	\$0.50	5 x 8,	\$1.00
4 x 5, . . . . .	.75	8 x 10,	2.00
5 x 7,	1.00		

Embossing Presses.

McCollin,	\$25.00
Dorticus,	12.00
McKee,	12.00
Extra Dies,	2.00

Ideal Print Trimmer.

Trims up to 5 inches square. Used with a pair of scissors. Metal, nicely plated.

Price, \$0.20.

ADJUSTABLE PHOTOGRAPHIC ENVELOPES.

Holds one to twelve mounted photographs.

	Per 100.
No. 2, for 4¼ x 5¼ cards,	\$0.90
" 3, " 5 x 5 "	1.00
" 5, " 5½ x 6½ "	1.10
" 5½ x 7½ "	1.10
" 4½ x 6 "	1.25

ENCLOSURES.

White, pink, heliotrope.

Number.	Size.	Rice Bond.	Surah Linen.	Napoleon Bond.
5	2½ x 4	\$1.25	\$1.60	\$1.60
15	3½ x 4	1.25	1.60	1.60
20	3½ x 5	1.25	1.60	1.60
21	3½ x 5	1.25	1.60	1.60
30	4¼ x 6	1.25	1.60	1.60
34	4¼ x 5	1.25	1.60	1.60
35	4¼ x 6	1.25	1.60	1.60
36	4¼ x 6	1.40	1.75	1.75
38	4¼ x 6	1.40	1.75	1.75
40	5 x 7	2.05	2.50	2.50
40½	5 x 7	2.10	2.60	2.60
42	5 x 7	2.05	2.50	2.50
42½	5 x 7	2.60	3.25	2.60
43	5 x 7	2.70	3.40	2.70
45	5½ x 8	2.90	3.50	2.90
46	6 x 8	3.15	3.65	3.15
49	6½ x 9	3.50	3.80	3.50
50	6½ x 10	3.80	3.80	3.80
52	7 x 9	3.80	4.00	3.50
60	8½ x 10	5.00	6.00	6.00
70	10½ x 12	6.25	9.00	9.00

Other sizes at short notice.

Universal Bond, No. 35; Empire, No. 35; per 1,000, \$1.00

Mailing Envelopes.

Per 1,000.

Cabinet, 5½ x 7½, 9283, 28-lb. manila,	\$1.10
" 9363, 36 " "	1.20
" 9403, 40 " "	1.30
" 9503, 50 " "	1.50
Corona, 6¼ x 8¼, 9503, 50 " "	2.00
8½ x 10½, 9503, 50 " "	3.75

Non-actinic Proof Envelopes.

No. 6, size 3½ x 6, non-actinic, high cut, per 1,000,	\$1.00
" 7, " 4½ x 6½, " " " "	1.85

Negative Preservers, Best Quality.

For 3½ x 4½ plate, per 100,	\$0.25	Per 1,000,	\$2.25
" 4 x 5 " " . . . . .	.30	" " " "	2.50
" 4½ x 6½ " " . . . . .	.30	" " " "	2.75
" 5 x 7 " " . . . . .	.35	" " " "	3.00
" 5 x 8 " " . . . . .	.35	" " " "	3.25
" 6½ x 8½ " " . . . . .	.45	" " " "	4.20
" 8 x 10 " " . . . . .	.55	" " " "	5.00
" 10 x 12 " "	1.00	" " " "	10.00
" 11 x 14 " "	1.25	" " " "	12.50
" 14 x 17 " "	2.75		

Ferrotypes Envelopes.

Bon-ton size, pink flap, buff or pearl cards, oval or arch top opening,	\$1.15
Cabinet size, pink flap, buff or pearl cards, red borders, oval or arch top opening, 3 x 4½,	4.00
Pink flap, maroon cards, gilt borders, oval or arch top opening, 2 x 3½,	2.50
Pink flap, buff or pearl cards, red borders, oval or arch top opening, 2 x 3½,	1.40

Star Negative Files.



3½ x 3½,	\$0.40
3½ x 4½,40
4 x 5,45
5 x 7,50
6½ x 8½,60
8 x 10,75

Film Albums.

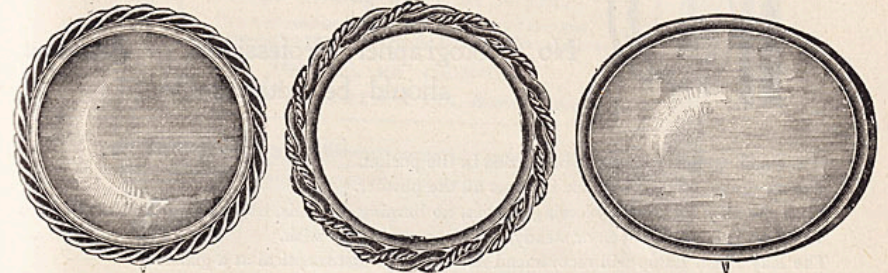
For 50, 3½ x 3½,	\$0.75;	4 x 5,	\$0.75;	5 x 7,	\$1.00
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Lavette Mailing Envelopes.

Cabinet size, 4½ x 7,	2 for 5 cents;	per 125,	\$1.25
No. 2, 5½ x 7½,	4 cents;	3 " 10 " " " 100,	1.50
No. 3, 6 x 8½,	each 5 " " " 100,		2.50
No. 4, 8½ x 10½,	" 10 " " " 50,		1.75

The Unique Photograph Jewelry Mountings.

Rolled Plate.



No. 24, . . . \$0.21 No. 74, . . . \$0.50. No. 115, . . . \$0.30.

These mountings are well made, of rolled plate, in form of clasp pins, stick pins, etc., with a transparent celluloid front. By removing the back, an unmounted photograph, trimmed to fit, may be inserted and fastened in. This makes a very neat and attractive novelty.

There are many other styles which we have not space to illustrate, in brooches, hat pins, cuff buttons, stick pins, etc. Complete illustrated price list on application.

The Aetna Flash Lamp.

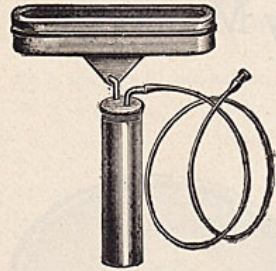
Uses **compound** flash powders.

This lamp consists of a pan to hold a charge of compound flash powder, a reflector which serves to increase the light thrown forward, and a pneumatic piston carrying an alcohol-saturated asbestos wad, which darts through a hole in reflector and ignites the powder. The flash is instantaneous, and the pneumatic igniter makes it possible to flash at the exact instant one wishes it.

Price, \$1.25

Flash Light Powders.

Lloyd's Pure Magnesium , warranted perfectly pure and safe. To be used in magazine and reservoir flash lamps. In air-tight tins, per oz.,	\$0.40
Lloyd's lightning flash powder, per oz. (do not use in magazine lamps!!), . . . . .	.40
Lloyd's flash cartridges, No. 1, \$0.25; No. 2, \$0.40; No. 3, \$0.60; No. 4, \$0.75	
Eastman flash sheets, per ½ dozen, . . . . .	.50
Luxo, 1-oz. bottles only, . . . . .	.60
Blitz pulver, 1-oz. package only, . . . . .	.60
Sun flash powder, 1-oz. bottles only, . . . . .	.60
Sun flash cartridges, box of 6, . . . . .	.25
Scovill magnesium cartridges, No. 1, \$0.25; No. 2, \$0.40; No. 3, \$0.60; No. 4, \$0.75.	
Sunlight flash powder, A, \$0.25; B, \$0.40; C, \$0.60; D, \$0.75.	



The Ray Flash Lamp.

Is the simplest, most practical, and the nearest to perfection of any Flash Lamp ever placed on the market.

No Photographer, Professional or Amateur, should be without One.

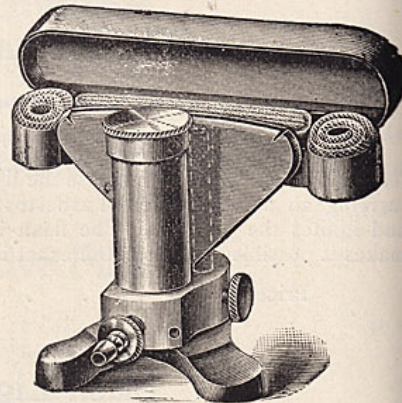
It is small, compact, and can be carried in the pocket.
 The most economical, because it burns all the powder.
 With the Ray there is no blurring of eyes, no burning of hands, no clogging of intricate parts.
 The flash is instantaneous or steady, as the operator may wish.
 The Ray Flash Lamp will recommend itself to the most sceptical at a glance.

No. 1. For amateurs,	\$1.50
No. 2. " professionals,	3.00

The Prosch Storage Flash Lamp.

For XX Pure Magnesium Powder.

Made of brass, heavily nickel-plated, each lamp packed in pasteboard box, with wicks, handle, bottles for alcohol and magnesium, and five feet rubber tubing with mouth-piece.

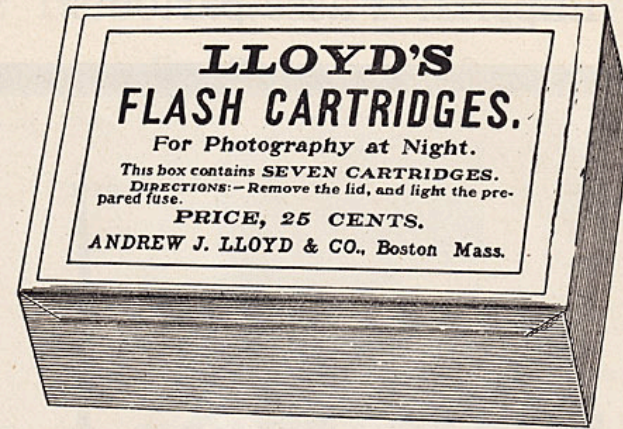


PRICES.

Complete as above,	\$4.50
Extra tubing, per foot, . . . . .	.06
Storage chamber extensions, doubling capacity, . . . . .	.35
Connectors for 2 lamps, . . . . .	.60
" " 3 " . . . . .	.80
" " 4 " 	1.00
Reflectors (6 in.),	2.75

The Prosch Professional Storage Lamp.

Complete,	\$9.00
Extra tubing, per foot, . . . . .	.10
Storage chamber, doubling capacity, . . . . .	.45
The Little Giant Flash Lamp,	2.50
The Perfection Flash Lamp,	2.50



We beg to introduce our new LLOYD FLASH CARTRIDGES, with the use of which photographs can be made instantaneously which could scarcely otherwise be secured without great expense and trouble. With the aid of these cartridges, photographs may be made under the most happy auspices on the occasions of fancy dress parties, private theatricals, college dinners, weddings, etc.



The LLOYD FLASH CARTRIDGES unite the excellent qualities of powerful actinic light, convenience of ignition, and safety as to their non-explosive nature.

They are prepared in different quantities and put up in tin boxes, each box containing seven little wooden boxes, so that a light is always at hand and convenient for use. A cover which is properly fitted protects them from dampness. A fuse is at the bottom of the cartridge, so there is no danger of premature explosion, thus avoiding accidents.

There are no poisonous or otherwise unpleasant gases or vapors from the burning. Each package has full directions on cover.

PRICES FOR THE LLOYD FLASH CARTRIDGES.

No. 1, package of seven, small size, per package,	\$0.25
No. 2, " " " medium size, per package, . . . . .	.40
No. 3, " " " large " " " . . . . .	.60
No. 4, " " " largest " " " . . . . .	.75

Imperial Passe-partouts.



These mounts are very artistic, and give the photograph the richness of a framed picture. We are introducing these for photographers, amateur and professional, who have long felt the need of something better than a card mount, at a price much below the cost of a framed picture.

The mounts or frames are heavy mats of various colors and with wide margins, are covered with glass, and neatly bound on the edges. The back is removable for inserting the mounted picture, and has a wire support attached, which serves to hold the frame and picture upright on a table, desk, or mantel.

These mounts also make a very acceptable form in which to give away portraits.

PRICE LIST.

Please specify whether horizontal or upright, for landscapes or portraits.

2½ x 3½ Folding pocket kodak,	\$0.25	5 x 7,	\$0.50
3 x 4, . . . . .	.25	6½ x 8½, . . . . .	.50
3½ x 3½, Bull's-eyes, Rays, etc., . . . . .	.25	8 x 10, . . . . .	.75
4 x 5, . . . . .	.35	10 x 12,	1.00

With Inside Mask.

Mantello,	\$0.20
Cabinet,25

Heavy Bevel Edge Mat, Oval or Oblong.

Cabinet,	\$0.75
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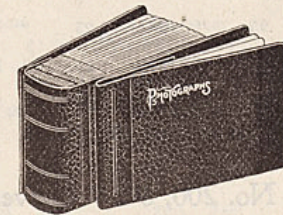
Photo Holders.

These are little rings of wire by which a number of photographs may be fastened one to another and grouped according to taste. Per doz., \$0.15.

Wire easels	Per dozen, \$0.60
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The New Gilson Adjustable Albums

For Photographic Views.



Adjustable Covers. Interchangeable Leaves.

The only albums that will fit collections of all sizes, employing
From 1 to 50 Leaves.



This album, *unlike any other on the market*, will exactly fit any-sized collection of photographs employing from one to fifty leaves. The surplus back slides in on the back cover until needed for the addition of other leaves. Leaves can be removed or

added in a moment by simply loosening a silk cord.

For collections of photographs this album has no equal. There are no disappointing blank leaves, even though there are only one or two photographs in the collection; and yet the collection can be increased to one hundred photographs. It is equally adapted to small gift collections or large home collections.

The bindings are the best of their kind. The cloth album is bound in one of the new art cloths. The half leather is bound in the best seal grain leather and art cloth. The full leather is seal grain throughout. All the bindings employ a silk cord.

The word "Photographs" is stamped in gold in a very attractive design near the upper left-hand corner leaving the centre of cover free for the stamping of the name of the collection which it may contain.

Interchangeable leaves, on which to mount and burnish photographs, are made in both white and gray cards. Interchangeable squeegee leaves, with openings on both sides of the leaf for unmounted photographs, are furnished in all sizes.

Covers and leaves may be had separately, enabling purchasers to make up their own albums. All the styles of leaves of any one size may be used together, making it possible to have a variety of leaves in one album.

NOTE.—In the following price list the first figure in each album number denotes the size, the second figure denotes style of binding, the third figure denotes kind of leaf. Thus, "312" means the 3d size, 1st style of binding, and 2d kind of leaf; or, in other words, 7 x 10 size, cloth binding, plain gray leaves.

PRICE LIST. Order by Number.

Size No. 100, 4 1-2 x 5 1-2 Leaves.

For one 2½ x 3½, 3½ x 4½, or 3½ x 3½ Print, or four Pocket Kodaks.

Albums with One Dozen Leaves.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
White Cards,	No. 111	No. 121	No. 131	Per package of 1 doz. No. 101
	\$0.80	\$1.10	\$1.65	\$0.30
Gray.				
	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
Gray Cards,	No. 112	No. 122	No. 132	Per package of 1 doz. No. 102
Squeegee for one 3½ x 4½ Print,	" 114	" 124	" 134	" 104
Squeegee for one 3½ x 3½ Print,	" 114A	" 124A	" 134A	" 104A
Squeegee for four Pocket Kodaks,	" 114B	" 124B	" 134B	" 104B
Squeegee for one Folding Pocket Kodak,	" 114D	" 124D	" 134D	" 104D
	.95	1.25	1.80	.45
	.95	1.25	1.80	.45
	.95	1.25	1.80	.45
	.95	1.25	1.80	.45

Steel Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 115	No. 125	No. 135	No. 105
	\$0.80	\$1.10	\$1.65	\$0.30
Steel Gray Cards, Squeegee for one 3½ x 4½ Print,	" 116	" 126	" 136	" 106
Squeegee for one 3½ x 3½ Print,	" 116A	" 126A	" 136A	" 106A
Squeegee for four Pocket Kodaks,	" 116B	" 126B	" 136B	" 106B
Squeegee for one 2½ x 3½ Print,	" 116D	" 126D	" 136D	" 106D
Covers without Leaves,	" 110	" 120	" 130	" 100

Size No. 200, 6 x 7 Leaves.

For one 4 x 5 or 4 x 4 Print.

Albums with One Dozen Leaves.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 211	No. 221	No. 231	No. 201
	\$0.90	\$1.25	\$1.90	\$0.35
White Cards,				

Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 212	No. 222	No. 232	No. 202
	\$0.90	\$1.25	\$1.90	\$0.35
Gray Cards, Squeegee for 4 x 5 Print,	" 214	" 224	" 234	" 204

Steel Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 215	No. 225	No. 235	No. 205
	\$0.90	\$1.25	\$1.90	\$0.35
Steel Gray Cards, Squeegee for 4 x 5 Print,	" 216	" 226	" 236	" 206
Covers without Leaves,	" 210	" 220	" 230	" 200

Size No. 300, 7 x 10 Leaves.

For one 5 x 7 or 5 x 8 Print or two 5 x 4, 4 x 4, or 3½ x 3½ Prints.

Albums with One Dozen Leaves.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 311	No. 321	No. 331	No. 301
	\$1.05	\$1.50	\$2.30	\$0.45
White Cards,				

Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 312	No. 322	No. 332	No. 302
	\$1.05	\$1.50	\$2.30	\$0.45
Gray Cards, Squeegee for one 5 x 7 Print,	" 314	" 324	" 334	" 304
Squeegee for two 3½ x 3½ Prints,	" 314A	" 324A	" 334A	" 304A
Squeegee for two 4 x 5 Prints,	" 314C	" 324C	" 334C	" 304C

Steel Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 315	No. 325	No. 335	No. 305
	\$1.05	\$1.50	\$2.30	\$0.45
Steel Gray Cards, Squeegee for one 5 x 7 Print,	" 316	" 326	" 336	" 306
Squeegee for two 3½ x 3½ Prints,	" 316A	" 326A	" 336A	" 306A
Squeegee for two 4 x 5 Prints,	" 316C	" 326C	" 336C	" 306C
Squeegee for four 2½ x 3½ Prints,	" 316D	" 326D	" 336D	" 306D
Covers without Leaves,	" 310	" 320	" 330	" 300

Size No. 500, 10 x 12 Leaves.

For one 8 x 10 Print or four 3½ x 3½ Prints.

Albums with One Dozen Leaves.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 511	No. 521	No. 531	No. 501
	\$1.50	\$2.50	\$3.75	\$0.75
White Cards,				

Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 512	No. 522	No. 532	No. 502
	\$1.50	\$2.50	\$3.75	\$0.75
Gray Cards, Squeegee for one 8 x 10 Print,	" 514	" 524	" 534	" 504
Squeegee for four 3½ x 3½ Prints,	" 514A	" 524A	" 534A	" 504A

Steel Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 515	No. 525	No. 535	No. 505
	\$1.50	\$2.50	\$3.75	\$0.75
Steel Gray Cards, Squeegee for four 3½ x 3½ Prints,	" 516A	" 526A	" 536A	" 506A
Covers without Leaves,	" 510	" 520	" 530	" 500

Size No. 600, 11 x 14 Leaves.

For one 10 x 12 Print or four 4 x 4 or 4 x 5 Prints.

Albums with One Dozen Leaves.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 611	No. 621	No. 631	No. 601
	\$1.75	\$3.00	\$4.50	\$1.00
White Cards,				

Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 612	No. 622	No. 632	No. 602
	\$1.75	\$3.00	\$4.50	\$1.00
Gray Cards, Squeegee for four 4 x 5 Prints,	" 614C	" 624C	" 634C	" 604C

Steel Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 615	No. 625	No. 635	No. 605
	\$1.75	\$3.00	\$4.50	\$1.00
Steel Gray Cards, Squeegee for four 4 x 5 Prints,	" 616C	" 626C	" 636C	" 606C
Covers without Leaves,	" 610	" 620	" 630	" 600

Size No. 1300, 10 x 7 Leaves.

For one 8 x 5 or 7 x 5 or two 4 x 5, 4 x 4, or 3½ x 3½ Prints.

Albums with One Dozen Leaves.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 1311	No. 1321	No. 1331	No. 1301
	\$1.25	\$1.75	\$2.65	\$0.55
White Cards,				

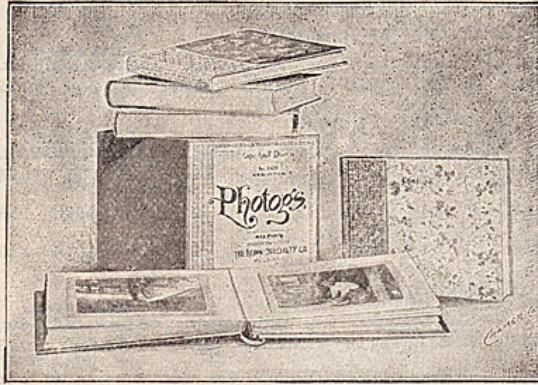
Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 1312	No. 1322	No. 1332	No. 1302
	\$1.25	\$1.75	\$2.65	\$0.55
Gray Cards, Squeegee for two 4 x 5 Prints,	" 1314	" 1324	" 1334	" 1304

Steel Gray.

	Cloth.	Half Leather.	Full Leather.	Extra Leaves.
	No. 1315	No. 1325	No. 1335	No. 1305
	\$1.25	\$1.75	\$2.65	\$0.55
Steel Gray Cards, Squeegee for two 4 x 5 Prints,	" 1316C	" 1326C	" 1336C	" 1306C
Covers without leaves,	" 1310	" 1320	" 1330	" 1300

Photogs.



These little books represent the result of constant efforts to produce devices of the greatest utility, highest artistic merit, and lowest cost for the preservation of the amateur photographer's collection. They are designed for dainty, appropriate bindings for a few selected views, either for personal use or as a gift to a friend. They contain spaces for twelve and twenty-four prints respectively, and are bound in an especially attractive manner, with wide backing embossed in aluminum scroll design, and the side binding of richly illuminated and embossed imported material. The mask leaves are made of rough finished paper, with a

delicately tinted border surrounding the opening.

In addition to the above described books, we carry the same in dark bindings, which might be considered as less apt to soil. These are as follows:—

Imitation red seal backs and corners, and black watered silk sides; full imitation seal in assorted colors, red, brown, and black. The leaves may be had in either buff or ash gray color, the surface presenting a rough, unfinished appearance, which adds greatly to the tone of the photograph.

NOTICE.—In ordering please state whether BUFF or ASH is wanted. When order does not specify, we invariably send BUFF.

Number and size of openings, prices, etc., as follows:—

Number and Size of Openings.	Full Seal Gr. Assorted Colors.			Price, each.
	Assorted Fancy Binding. Number.	Red Seal Gr. Back and Corners. Number.	Red, Brown, and Black. Number.	
48 Pk. Kodak,	1000	1007	1010	\$0.50
12 F. Pk. Kodak,	1100	1107	1110	.50
12 3½ x 3½,	1200	1207	1210	.50
12 3½ x 4½,	1300	1307	1310	.50
12 4 x 5,	1400	1407	1410	.50
12 4½ x 4½,	1500	1507	1510	.50
12 2½ x 2½,	1600	1607	1610	.50
12 5 x 7,	1700	1707	1710	.75
96 Pk. Kodak,	1020	1027	1030	.75
24 F. Pk. Kodak,	1120	1127	1130	.75
24 3½ x 3½,	1220	1227	1230	.75
24 3½ x 4½,	1320	1327	1330	.75
24 4 x 5,	1420	1427	1430	.75
24 4½ x 4½,	1520	1527	1530	.75
24 2½ x 2½,	1620	1627	1630	.75
24 5 x 7,	1720	1727	1730	1.00

Badger Plain Leaf Albums.

These are designed for those who wish to paste their photographs on the leaf, and are gotten up with a view to lessen the expense of preserving prints and at the same time allow a greater latitude in arrangement of same on the page.

For styles of bindings, individual numbers, and prices, see the following lists:—

Size of Album.	Binding, Red Im. Seal Backs and Corners. Watered Silk Sides.		Binding, Art Vellum. Assorted Colors: Gray, Olive, Terra Cotta.		Binding, Full Im. Seal. Assorted Colors: Red, Brown, Black.	
	No.	Price.	No.	Price.	No.	Price.
5 x 6½,	No. 701,	\$0.25	No. 721,	\$0.50	No. 741,	\$0.75
6½ x 8½,	" 702,	.50	" 722,	.75	" 742,	1.00
7½ x 9½,	" 703,	.75	" 723,	1.00	" 743,	1.25
10 x 12,	" 704,	1.25	" 724,	1.50	" 744,	2.00
11 x 14,	" 705,	1.50	" 725,	2.00	" 745,	2.50

Above albums may be had in BUFF or GRAY leaves, as desired. In ordering please state whether Buff or Gray leaves are wanted. When order does not specify, we invariably send Buff.

Rembrandt Mounts.

The most artistic mounting for mat surface prints, whether Platinum, Velox, or Aristo. These mounts are made in a variety of tints,—black, sepia, terra cotta, green, tan, and brown, delicately shaded from one side to the other. Rembrandts are undoubtedly the most popular mounts of the present day. We carry the black and sepia constantly, and supply others at short notice.

PRICE LIST.

Now made in a variety of tints, chief of which are black, sepia, terra cotta, green, tan, and brown.

Size.	Per doz.	Per 100.	Size.	Per doz.	Per 100.
6½ x 8½,	\$0.45	\$3.50	14 x 17,	\$1.65	\$12.00
8 x 10,	.50	4.00	16 x 20,	1.85	15.00
10 x 12,	.65	5.00	18 x 22,	2.25	18.00
11 x 14,	.90	7.00	22 x 28,	3.00	24.00

Bijou Folders.

In buff, white, or ash gray leaves. Specify which. All numbers, except 1, 21, and 31, are with squeegee leaves.

No. and Size of Opening.	Size of Folder.	BINDING. Maroon Holland.		BINDING. Art Vellum. Ass'd Colors: Gray, Olive.		BINDING. Full Im. Seal. Ass'd Col.: Red, Brown, Black.	
		No.	Price.	No.	Price.	No.	Price.
19 Plain pages,	3½ x 4½,	1	\$0.20	21	\$0.25	31	\$0.30
19 Fd. Pk Kodak,	3½ x 4½,	2	.30	22	.35	32	.40
38 Pk. Kodak,	3½ x 4½,	2½	.30	22½	.35	32½	.40
25 3½ x 3½,	5½ x 7½,	—	—	23	.75	33	1.00
25 3½ x 4½,	5½ x 7½,	—	—	24	.75	34	1.00
25 4 x 5,	5½ x 7½,	—	—	25	.75	35	1.00

Badger Flexible Albums.

Owing to a continual demand among the amateur photographers for a thin or flexible leaf album, we have decided to add a line of these to our already very complete list, and ask you to examine the "Badger Flexible," which is made in the most attractive styles, embodying neatness and durability.

The leaves may be had in either white or sage colors, the bindings in cloth or full leather, — the cloth in black fancy line pattern; the leather in a gros grain morocco finished leather, in black or maroon.

For protection to the prints we insert between each two leaves a transparent parchment, which prevents the rubbing or marring of the pictures.

For mounting in these books we would suggest tipping only the corners of the print with paste, instead of gumming the entire reverse side of photograph. This will prevent the curling or warping of the leaf.

Price List of Badger Flexible Albums.

FULL CLOTH, BLACK.			
Number.	Size of Leaf.	Number of Leaves.	Price, Each.
601,	5½ x 7	25	\$0.35
602,	5½ x 7	50	.50
603,	7 x 10, oblong.	25	.50
604,	7 x 10 "	50	.75
605,	10 x 7, upright.	25	.50
606,	10 x 7 "	50	.75

FULL LEATHER MOROCCO GRAIN,—ASSORTED, MAROON AND BLACK.			
Number.	Size of Leaf.	Number of Leaves.	Price, Each.
611,	5½ x 7	25	\$0.75
612,	5½ x 7	50	.85
613,	7 x 10, oblong.	25	1.00
614,	7 x 10 "	50	1.25
615,	10 x 7, upright.	25	1.00
616,	10 x 7 "	50	1.25

In ordering state number, color of binding, and color of leaf wanted.

Lloyd's Tarjo Cards.

White, Plain Straight Edge, Enamelled Face, Plain Back.

* No. 870. For photographs $1\frac{1}{2} \times 1\frac{1}{2}$, . . . \$2.25	† No. 873. For photographs $3\frac{1}{2} \times 3\frac{1}{2}$, . . . \$6.00
* " 889. " $1\frac{1}{2} \times 2$, . . . 2.50	† " 874. " $3\frac{1}{2} \times 4\frac{1}{2}$, . . . 6.50
† " 872. " $2\frac{1}{2} \times 2\frac{1}{2}$, . . . 3.50	† " 875. " 4×4 , . . . 7.00
† " 899. " $2\frac{1}{2} \times 2$, . . . 3.50	† " 876. " 4×5 , . . . 8.00
† " 896. " $2\frac{1}{2} \times 3\frac{1}{2}$, . . . 4.50	† " 892. " 5×7 , . . . 15.00

Tea, Sage, or Queen's Gray. Plain, Straight Edge, Unenamelled.

* No. 891. For photographs $1\frac{1}{2} \times 2$, . . . \$2.50	† No. 884. For photographs $3\frac{1}{2} \times 4\frac{1}{2}$, . . . \$6.50
† " 882. " $2\frac{1}{2} \times 2\frac{1}{2}$, . . . 3.50	† " 885. " 4×4 , . . . 7.00
† " 897. " $2\frac{1}{2} \times 3\frac{1}{2}$, . . . 4.50	† " 886. " 4×5 , . . . 8.00
† " 883. " $3\frac{1}{2} \times 3\frac{1}{2}$, . . . 6.00	† " 893. " 5×7 , . . . 15.00

White, Queen's Gray Border. Plain Straight Edge, Enamelled Face, Plain Back.

* No. 890. For photographs $1\frac{1}{2} \times 2$, . . . \$4.50	† No. 879. For photographs $3\frac{1}{2} \times 4\frac{1}{2}$, . . . \$9.50
† " 877. " $2\frac{1}{2} \times 2\frac{1}{2}$, . . . 6.00	† " 880. " 4×4 , . . . 10.00
† " 898. " $2\frac{1}{2} \times 3\frac{1}{2}$, . . . 7.00	† " 881. " 4×5 , . . . 11.00
† " 878. " $3\frac{1}{2} \times 3\frac{1}{2}$, . . . 9.50	† " 894. " 5×7 , . . . 20.00

Photo Cards.

Cards with Plate Sunk Centre and India Insert. Plain Straight Edge, Square Corners.

Scotch Gray or Ivy Green.	
† No. 840. Cards $5\frac{1}{2} \times 5\frac{1}{2}$, for photographs $3\frac{1}{2} \times 3\frac{1}{2}$, . . . per 100,	\$17.5
† " 839. " 7×8 , " 4×5 , . . . " "	2.00

Tinto.

Inlaid Centre. Plain Bevelled Edge, Round Corners. Sage or Ash Gray.

† No. 837. Cards $5\frac{1}{2} \times 5\frac{1}{2}$, India centre $3\frac{1}{2} \times 3\frac{1}{2}$, for photographs $3\frac{1}{2} \times 3\frac{1}{2}$, . . . per 1,000,	\$12.00
† " 838. " $6\frac{1}{2} \times 7\frac{1}{2}$, " $4\frac{1}{2} \times 5\frac{1}{2}$, " " 4×5 , " " "	16.00

Capito.

Circle Opening. Matched Bevelled Edge, Square Corners. Tea, Sage, or Ash Gray.

† Cards $5\frac{1}{2} \times 5\frac{1}{2}$, for unmounted photographs $3\frac{1}{2} \times 3\frac{1}{2}$, . . . per 1,000,	\$25.00
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Circo.

Tea, Sage, or Ash Gray.

† A. Circle cards $3\frac{1}{2}$ in., for photographs $2\frac{1}{2}$ in., . . . per 1,000,	\$5.50
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Guido.

DESIGN PATENTED JUNE 28, 1898.

Sage or Ash Gray. White Embossed Border, Plain Bevelled Edge, Round Corners.

† Cards $6\frac{1}{2} \times 7\frac{1}{2}$, for photographs 4×5 , . . . per 1,000,	\$18.00
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Roselli.

DESIGN PATENTED NOVEMBER 1, 1898.

Sage or Ash Gray. With Embossed Corner Pockets for Unmounted Photographs.

Cards $5\frac{1}{2} \times 5\frac{1}{2}$, for photographs $3\frac{1}{2} \times 3\frac{1}{2}$, from $3\frac{1}{2} \times 3\frac{1}{2}$ plate, . . . per 1,000,	\$18.00
Cards $6\frac{1}{2} \times 7\frac{1}{2}$, " $3\frac{1}{2} \times 4\frac{1}{2}$, " 4×5 " " " " "	20.00

Sold only in boxes containing 100 cards of one size.

Stereoscope Mounts.

Dark Buff, Tea, Mode, Sage, or Ash Gray.

No. 50. Unenamelled, round corners, cards $3\frac{1}{2} \times 7$, . . . per 1,000,	\$3.50
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* 500 in a box. † 200 in a box. ‡ 100 in a box. § 50 in a box.

Easelette.

Made from Ash Gray Cards.

One hundred in a pack, per 1,000,	\$4.00
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Auroid Metal Bevelled Edge.

(NOT GUARANTEED.)

No. 835. Primrose, Unenamelled.

† $4\frac{1}{2} \times 5\frac{1}{2}$, per 1,000,	\$5.00
† 5×7 , " " " "	10.00

No. 378. Primrose, Embossed Border.

DESIGN PATENTED JANUARY 1, 1895.

† Cards $4\frac{1}{2} \times 5\frac{1}{2}$, for photographs 4×5 , per 1,000,	\$5.50
† " $5\frac{1}{2} \times 7\frac{1}{2}$, " 5×7 , " "	11.00
† " $5\frac{1}{2} \times 8\frac{1}{2}$, " 5×8 , " "	12.00
† " 8×10 , " 7×9 , " "	22.50

Yuko.

White. Enamelled Face, Plain Back, Round Corners.

* A. Cards $3\frac{1}{2} \times 3\frac{1}{2}$, for photographs $2\frac{1}{2} \times 2\frac{1}{2}$, per 1,000,	\$4.50
† C. " $4\frac{1}{2} \times 5\frac{1}{2}$, " 4×5 , " " " "	7.00

Little Queen.

White. Unenamelled, Plain Serrated Edge.

* No. 355. Cards $3\frac{1}{2} \times 4\frac{1}{2}$, for photographs 3×4 and $3\frac{1}{2} \times 4\frac{1}{2}$, . . . per 1,000,	\$5.00
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Zarno.

Gray or Tea Color. For Unmounted Photographs.

† "A." Cards $5\frac{1}{2} \times 6\frac{1}{2}$, for photographs 4×5 , per 1,000,	\$17.00
† "B." " $5\frac{1}{2} \times 5\frac{1}{2}$, " $3\frac{1}{2} \times 3\frac{1}{2}$, " "	15.00
† "C." " $6\frac{1}{2} \times 8\frac{1}{2}$, " 5×7 , " "	25.00

Melton. No. 841.

Plain Bevelled Edge, Round Corners. Scotch Gray, Ivy Green, or Royal Brown. Gray Back.

† Cards 5×5 , for photographs $2\frac{1}{2} \times 2\frac{1}{2}$ or $3\frac{1}{2} \times 3\frac{1}{2}$, per 100,	\$0.65
" 7×9 , " " $2\frac{1}{2} \times 3\frac{1}{2}$ " $3\frac{1}{2} \times 4\frac{1}{2}$, " "	1.75
" 8×10 , " " 4×5 " 5×7 , " "	2.00
" 10×12 , " " 5×8 " $6\frac{1}{2} \times 8\frac{1}{2}$, " "	2.75
" $10\frac{1}{2} \times 13\frac{1}{2}$, " " 7×9 " 8×10 , " "	3.50

No. 836.

Plain Bevelled Edge, Round Corners. Queen's Gray, Sage, or Ash Gray.

† Cards $4\frac{1}{2} \times 5\frac{1}{2}$, for photographs $2\frac{1}{2} \times 3\frac{1}{2}$, per 1,000,	\$4.25
† " 5×5 , " " $2\frac{1}{2} \times 2\frac{1}{2}$ or $3\frac{1}{2} \times 3\frac{1}{2}$ or 4×4 , " "	5.50
† " 5×6 , " " $3\frac{1}{2} \times 4\frac{1}{2}$ " 4×5 " " " "	5.75
† " $5\frac{1}{2} \times 7\frac{1}{2}$, " " 5×7 , " "	7.50

Allesso.

Plain Straight Edge, Round Corners. Mode, Sage, Steel Gray, or Ash Gray.

† Cards $4\frac{1}{2} \times 5\frac{1}{2}$, for photographs $2\frac{1}{2} \times 3\frac{1}{2}$, per 1,000,	\$4.25
† " 5×5 , " " $2\frac{1}{2} \times 2\frac{1}{2}$ or $3\frac{1}{2} \times 3\frac{1}{2}$ or 4×4 , " "	5.25
† " 5×6 , " " $3\frac{1}{2} \times 4\frac{1}{2}$ " 4×5 , " "	5.75
† " $5\frac{1}{2} \times 7\frac{1}{2}$, " " 5×7 , " "	6.75

* 500 in a box. † 200 in a box. ‡ 100 in a box. § 50 in a box.

WE ALWAYS HAVE THE LATEST NOVELTIES AS WELL AS ALL THE STAPLES IN

PHOTOGRAPHIC CARD MOUNTS,

AND SHALL BE PLEASED TO MAIL TWELVE ASSORTED SAMPLES ON RECEIPT OF TWELVE TWO-CENT STAMPS.
WE CONSTANTLY CARRY A COMPLETE LINE OF

The A. M. Collins
Manufacturing Company's

Photographic
Card Stock.

WE PAY ESPECIAL ATTENTION TO PHOTOGRAPHIC CARDS, BLANKS, ETC., AND WILL SEND CATALOGUE AND PRICE LIST FOR THE ASKING.

Photographic Books.

Lloyd's Guide for Beginners in Photography,	\$0.10
Lloyd's Record Book and Tables of Exposure, . . . . .	.10
The Studio and What to Do in It. H. P. Robinson,	1.00
The Elements of a Pictorial Photograph. "	1.75
Picture-making by Photography. "	1.25
Art Photography. " . . . . .	.50
Letters on Landscape Photography. "	1.00
Pictorial Effect in Photography. "	1.00
The Photographic Primer. Mellen & Worthington,	1.00
First Step in Photography. F. Dundas Todd, . . . . .	.25
Second Step in Photography. " . . . . .	.50
Photo Beacon Exposure Tables, . . . . .	.25
The Knack, . . . . .	.25
Photographic Lenses. J. A. Hodges,	1.00
Photography Indoors and Out. Alexander Black, . . . . .	.75
An Adventure in Photography. Octave Thanet,	1.50
Artistic Lighting. James Inglis,	1.00
Part I., Reference Book of Practical Photography. Todd, . . . . .	.50
How to Make and Color Lantern Slides. Elmendorf,	1.00
Lantern Slides and How to Make Them. A. R. Dresser, . . . . .	.25
Photographic Amusements. W. E. Woodbury,	1.00
Sunlight and Shadow. W. I. L. Adams,	2.50
Chemistry of Light and Photography. Dr. Vogel,	2.00
Photographic Printing Methods. W. H. Burbank, . . . . .	.75
Practical Enlarging. John A. Hodges, . . . . .	.50
Developers, their Use and Abuse. Richard Penlake, . . . . .	.25
Modern Developers and How to Use Them, . . . . .	.25
The Dark-room and its Equipment. H. J. Masse, . . . . .	.25
Chemistry for Photographers. Charles F. Townsend, . . . . .	.50
The A. B. C. of Retouching. Andrew Young, . . . . .	.25
Carbon Printing. E. J. Wall, . . . . .	.50
Platinotype Printing. A. Horsley Hinton, . . . . .	.50
Lantern Slides, their Production and Use. J. Pike, . . . . .	.25

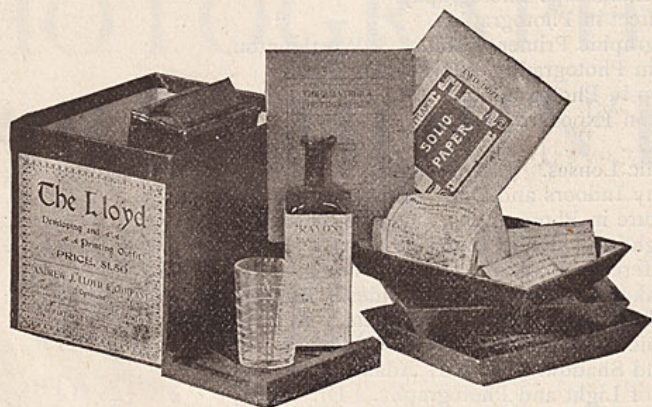
Magazines.

	Per copy.	Per year.
The Photogram,	\$0.15	\$1.50
Photo Era, . . . . .	.15	1.50
Photo Miniature, . . . . .	.25	2.50
The Photographic Times, . . . . .	.35	4.00
The Photo Beacon, . . . . .	.10	1.00
Wilson's Photographic Magazine, . . . . .	.30	3.00
Anthony's Photographic Bulletin, . . . . .	.25	2.00
Professional Photographer, . . . . .	.10	1.00
American Journal of Photography, . . . . .	.25	2.00
American Annual of Photography, . . . . .		.75
Anthony's International Annual, . . . . .		.75
British Annual of Photography, . . . . .		.50

Subscriptions received for these magazines.

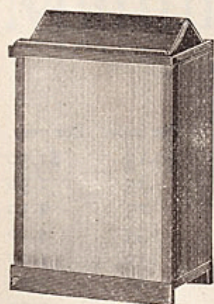
SPECIAL NOTICE.

The Lloyd Developing and Printing Outfit,



Comprising 3 composition trays, 1 printing frame, 1 package SOLIO printing-out paper, 1 bottle RAYON toning and fixing solution, 2 packages TRENOL developing powders for 8-ounce developer, 1 package hyposulphite of soda, 2-ounce graduate, 1 instruction book, put up in neat box.

The above outfit is supplied with either 3 1/2 x 3 1/2, 3 1/4 x 4 1/4, or 4 x 5 Printing Frames and Solio Paper. Please state, when ordering which size is wanted.



In addition to the above-mentioned articles, we are adding without extra charge our Metal Candle Lantern, herewith illustrated, thus maintaining the reputation of the Lloyd Outfit,—the very best for the money.

PRICE, COMPLETE, \$1.50.

The Lloyd, Jr., Developing and Printing Outfit,
PRICE, \$1.00.

Similar to LLOYD Outfit, with smaller trays and 3 1/2 x 3 1/2 printing frames and paper.

Developing and Printing...



WE now furnish prints in carbon effects in three days' time, irrespective of the weather, at the same prices as the glossy prints. Sample print sent for two two-cent stamps.

ALL the work of this department is returned to our customers in adjustable envelopes especially prepared for the purpose, which can be used to file away films if desired.

WE prevent misunderstandings, wrong deliveries, and other errors by a careful system of record. Customers are requested carefully to read their slips.

GLOSSY prints require the sun, hence all orders for these will be filled as promptly as the state of the weather permits.

The following prices are for plates or films. All prints under 5 x 7 are mounted on cards with embossed margin; 5 x 7 and over, on gilt edge cards unless otherwise ordered.

Pocket Kodak.	Each.	Doz.	4 x 5.—Adlake, Ray C and D, etc.	Each.	Doz.
Developed, printed, and mounted,	\$0.05	\$0.50	Developed, printed, and mounted,	\$0.13	\$1.25
Developed,	.02	.20	Developed,	.05	.50
Mounted prints,	.03	.30	Mounted prints,	.08	.90
Unmounted prints,	.02	.20	Unmounted prints,	.06	.70
2 x 2 1/2.—Baby Hawk-eye, Monroe No. 1.			5 x 7 and 5 x 8.		
Developed, printed, and mounted,	.06	.60	Developed, printed, and mounted,	.18	2.00
Developed,	.03	.30	Developed,	.06	.70
Mounted prints,	.04	.40	Mounted prints,	.12	1.30
Unmounted prints,	.03	.30	Unmounted prints,	.08	.95
2 1/2 x 2 1/2.—Ray, Jr.			6 1/2 x 8 1/2.		
Developed, printed, and mounted,	.07	.75	Developed, printed, and mounted,	.25	2.75
Developed,	.03	.35	Developed,	.10	1.10
Mounted prints,	.04	.45	Mounted prints,	.15	1.65
Unmounted prints,	.03	.35	Unmounted prints,	.10	1.10
2 1/2 x 3 1/2.—Folding Pocket Kodak.			8 x 10.		
Developed, printed, and mounted,	.08	.80	Developed, printed, and mounted,	.29	3.20
Developed,	.03	.30	Developed,	.12	1.30
Mounted prints,	.05	.55	Mounted prints,	.17	2.00
Unmounted prints,	.04	.40	Unmounted prints,	.12	1.30
3 1/2 x 3 1/2.—Ray, Bull's-eye, Hawk-eye, Jr., Bullet, Monroe No. 2, etc.			ENLARGEMENTS.		
Developed, printed, and mounted,	.10	1.00	4 x 5,		\$0.40
Developed,	.04	.40	5 x 7,		.55
Mounted prints,	.06	.70	6 1/2 x 8 1/2,		.60
Unmounted prints,	.05	.55	8 x 10,		.75
3 1/2 x 4 1/2.—Ray B, Gem, Premo V, etc.			10 x 12,		.85
Developed, printed, and mounted,	.10	1.00	11 x 14,		.95
Developed,	.04	.40	14 x 17,		1.10
Mounted prints,	.06	.70	Enamel, Platinoid, or Heavy Rough.		
Unmounted prints,	.05	.55	Platinoid unless otherwise ordered.		

Prints on Willis & Clement's Platinum Paper.

Will be furnished at a slight advance over the glossy prints, as following prices show.

Size.	Each, Unmounted.	Per doz., from one Negative, Unmounted.	Each Mounted, Plain Steel Gray Mounts.	Per doz., Mounted, Plain Steel Gray Mounts.
3 1/2 x 3 1/2	\$0.08	\$0.75	\$0.10	\$1.00
4 x 5	.08	.80	.10	1.05
4 1/2 x 5 1/2	.10	1.00	.12	1.25
4 1/2 x 6 1/2	.10	1.00	.14	1.40
5 x 7	.12	1.20	.17	1.60
5 x 8	.15	1.40	.20	1.90
6 1/2 x 8 1/2	.20	1.90	.25	2.50
8 x 10	.30	3.00	.40	3.75

These prices are for plain prints. Vignettes will be 25 per cent. higher than above rates. It is advised that the prints be plain and not vignettted, and the negative be fairly strong. If prints are desired mounted on platinotype India tint cards with concave centre, or Rembrandt, the price of mounts will be added to above list.

PRICE LIST

OF

PHOTOGRAPHIC CHEMICALS.

We wish to call attention to the fact that we are now putting up standard photographic chemicals under our own label. It is well known that many of the common photographic chemicals deteriorate and lose their strength under atmospheric changes; for instance, sulphite of soda, which oxidizes and turns into sulphate upon exposure to moist air, thus becoming totally unfit for use. Carbonate of soda dries up, and carbonate of potash absorbs large quantities of water under like conditions. Hence the need of appropriate containers. With these facts in view, we are now putting up such chemicals as need particular care in appropriate containers, as air-tight cans, etc.

c.s.—Cork Stopper. g.s.—Glass Stopper. C.P.—Chemically Pure.

<i>Acid, Acetic, No. 8, (30%)</i>	}	per 1/4 lb. bottle,	\$0.15
		" 1 " " . . . . .	.20
		" 2 " " . . . . .	.30
		" 5 " " . . . . .	.60
		in carboys, per lb., . . . . .	.05
		carboy,	1.50
" " Glacial, c.s., (99.5%)	}	per oz. bottle, . . . . .	.15
		" 4 " " . . . . .	.20
		" 8 " " . . . . .	.30
		" lb., . . . . .	.40
" Boracic,	}	" oz., . . . . .	.10
		" " "	0
" Citric,	}	" 1/4 lb., . . . . .	.40
		" 1/2 " " . . . . .	.0
" Gallic,	}	" lb., . . . . .	.50
		" lb. can,	1.00
" Muriatic, C.P., g.s. (<i>Hydrochloric</i>),	}	" oz. bottle, . . . . .	.15
		" 1/4 lb. " . . . . .	.20
		" 1/2 " " . . . . .	.30
		" 1 " " . . . . .	.40
		" 6 " "	1.20
" Nitric, C.P., g.s.,	}	" oz. " . . . . .	.15
		" 1/4 lb. " . . . . .	.20
		" 1/2 " " . . . . .	.30
		" 1 " " . . . . .	.40
		" 6 " "	1.30
" Oxalic, (*)	}	" oz. " . . . . .	.15
		" 1/4 lb. " . . . . .	.20
		" 1/2 " " . . . . .	.30
		" 1 " " . . . . .	.40
" Phosphoric, 50%,	}	" oz. " . . . . .	.15
		" 1/4 lb. " . . . . .	.20
		" 1/2 " " . . . . .	.30
		" 1 " " . . . . .	.40
" Pyrogallic (Merck), C.P., (*)	}	" oz. can, . . . . .	.30
		" 1/4 lb. "	1.00
		" 1/2 " "	1.90
		" 1 " "	3.60
" " (Schering), C.P., (*)	}	" oz. " . . . . .	.30
		" 1/4 lb. "	1.05
		" 1/2 " "	2.00
		" 1 " "	3.85
" Sulphuric, C.P., g.s.,	}	" oz. bottle, . . . . .	.15
		" 1/4 lb. " . . . . .	.20
		" 1/2 " " . . . . .	.30
		" 1 " " . . . . .	.40
		" 6 " "	1.20
" Sulphurous, g.s., (6.4%)		" 1 " " . . . . .	.27

(*) Poisonous!!

<i>Acid, Tartaric,</i>	}	per oz. bottle,	\$0.15
		" 1/4 lb. " . . . . .	.20
		" 1 " " . . . . .	.40
<i>Alum, Chrome,</i>	}	" lb. carton, . . . . .	.12
		" " bulk, . . . . .	.10
		" " carton, . . . . .	.10
		" " bulk, . . . . .	.06
" " Powdered,	}	" " carton, . . . . .	.12
		" " " . . . . .	.15
<i>Aluminum Chloride,</i>	}	" 1/4 lb. " . . . . .	.35
		" 1/2 " " . . . . .	.65
		" 1 " "	1.00
<i>Ammonia, Concentrated Liq., g.s.,</i>	}	" 1/2 " " . . . . .	.25
		" 1 " " . . . . .	.35
		" 4 " " . . . . .	.75
<i>Ammonium, Bichromate, c.s.,</i>	}	" 1 " "	1.25
		" 1 " bulk, . . . . .	.55
" Bromide,	}	" 1 " bottle, . . . . .	.75
		" 1/2 " " . . . . .	.45
" Carbonate,	}	" 1/4 " " . . . . .	.25
		" oz. " . . . . .	.12
" Chloride, c.s.,	}	" lb. " . . . . .	.40
		" oz. " . . . . .	.10
" Hydrate. See <i>Ammonia.</i> (†)		" lb. " . . . . .	.40
" Hydrosulphide,	}	" 1-lb. " . . . . .	.55
		" 5 " "	2.25
		" oz. " . . . . .	.38
" Iodide, C.P., g.s., (†)	}	" 1/4 lb. "	1.35
		" 1/2 " "	2.50
		" 1 " "	4.50
" Nitrate, Fused, c.s.,	}	" oz. " . . . . .	.12
		" 1/4 lb. " . . . . .	.18
		" 1/2 " " . . . . .	.25
" persulphate 15 g.	}	" 1 " " . . . . .	.40
		" oz. " . . . . .	.18
" Sulphocyanide, c.s. (<i>Rhodanide</i>), (†)	}	" 1/4 lb. " . . . . .	.35
		" 1/2 " " . . . . .	.60
		" 1 " "	1.10
<i>Amidol</i> (Hauff's-Andressen's),	}	" oz. " . . . . .	.75
		" 1/4 lb. "	2.75
		" 1/2 " "	5.25
" " "	}	" 1 " "	10.00
		" 1/4 " pkge., . . . . .	.20
<i>Arrowroot,</i>		" 1 " " . . . . .	.55
<i>Aurin,</i>		" oz., . . . . .	.50
<i>Barium, Chloride,</i>	}	" oz. bottle, . . . . .	.10
		" lb. " . . . . .	.35
" Nitrate,	}	" oz. " . . . . .	.10
		" lb. " . . . . .	.35
<i>Benzole</i> (not <i>Benzine</i>), (†)		" pt. " . . . . .	.60
<i>Borax,</i>	}	" gal. can,	2.00
		" lb. bulk, . . . . .	.16
<i>Bromine</i> (Keep off the hands),	}	" " carton, . . . . .	.20
		" oz. bottle, in tin can, . . . . .	.25
<i>Cadmium, Bromide,</i>	}	" oz. bottle, . . . . .	.25
		" lb. "	3.00
" Iodide,	}	" oz. " . . . . .	.40
		" lb. "	5.50
<i>Calcium, Bromide,</i>	}	" oz. " . . . . .	.20
		" " " . . . . .	.15
" Chloride, C.P., (†)	}	" lb. " . . . . .	.65
		" " " . . . . .	.45
" Iodide,	}	" oz. " . . . . .	.45
		" " " . . . . .	.18
<i>Chloroform,</i>		" lb. " . . . . .	.90

(†) Keep well stoppered.

Copper , Chloride, (†)	per oz. bottle,	\$0.15
" Sulphate (<i>Blue Vitriol</i>), (*)	" lb. " . . . . .	.15
Celloidin (Schering),	" oz. "	1.10
Cyanin ,	" 15-gr. vial,	1.00
Dextrine ,	" 1-lb. bottle, . . . . .	.18
	" 1-oz. " . . . . .	.37
Diogen ,	" 1-lb. "	1.20
	" 1/2 " "	2.10
	" 1 " "	3.95
	" 3-oz. " . . . . .	.70
Diphenal (<i>Concentrated solution</i>),	" 6 " "	1.30
	" 8 " "	2.35
	" oz. can, . . . . .	.37
Eikonogen (Andressen),	" 1-lb. "	1.20
	" 1/2 " "	2.10
	" 1 " "	3.95
	" 1-lb. bottle, . . . . .	.30
	" 1/2 " " . . . . .	.50
Ether , Sulphuric, Concentrated, g.s., (†)	" 1 " "	90
	" 3 " "	2.60
	" 5 " "	4.35
Formaldehyd (<i>Formaline</i>),	" oz. " . . . . .	.25
Gelatine, . . . . .	" " " . . . . .	.12
Glycerine ,	" 1-lb. " . . . . .	.40
	" oz. " . . . . .	.75
	" 1-lb. "	2.75
Glycin ,	" 1/2 " "	5.25
	" 1 " "	10.00
Gold , Chloride, C.P.,	" 15-gr. bottle, . . . . .	.45
" " " Wing's,	" 30 " "	1.15
" Pure,	" dwt. "	1.15
Gum , Arabic, selected,	" lb. bulk, . . . . .	.75
" Asphaltum, . . . . .	" " " . . . . .	.20
" Benzoin, . . . . .	" " " . . . . .	.75
" Camphor, . . . . .	" " " . . . . .	.45
" Damar, . . . . .	" " " . . . . .	.50
" Mastic,	" " "	1.50
" Sandarac, . . . . .	" " " . . . . .	.45
" Shellac, Brown, D.C., . . . . .	" " " . . . . .	.40
" " Refined, . . . . .	" " " . . . . .	.50
" Tragacanth,	" " "	1.20
" Turpentine, White, . . . . .	" " " . . . . .	.40
	" oz. bottle, . . . . .	.30
Hydrochinon (<i>Quinol</i>),	" 1-lb. "	1.00
	" 1/2 " "	1.75
	" 1 " "	3.25
Iodine , Resublimed, g.s.,	" oz. " . . . . .	.50
	" lb. "	4.50
Iron and Ammonia , Citrate, (†)	" oz. " . . . . .	.15
" " " Protosulphate,	" lb. " . . . . .	.85
" " " " " . . . . .	" " " . . . . .	.15
" Perchloride,	" carton, . . . . .	.12
" Protosulphate (<i>Copperas</i>), (†)	" bottle, . . . . .	.80
Kaolin ,	" can, . . . . .	.15
	" " " . . . . .	.15
Lead , Acetate, C.P. (<i>Sugar of Lead</i>), (*)	" oz. bottle, . . . . .	.12
	" 1-lb. " . . . . .	.20
	" 1 " " . . . . .	.30
	" oz. " . . . . .	.12
Lead , Nitrate, C.P.,	" 1-lb. " . . . . .	.20
	" 1 " " . . . . .	.40
Lithium , Bromide, (†)	" oz. " . . . . .	.32
" Chloride, . . . . . (†)	" " " . . . . .	.40
" Iodide,	" lb. "	4.00
	" oz. "	1.00
Litmus , Paper, Blue or Red,	" book or sheet, . . . . .	.01
	" doz. book or sheet, . . . . .	.50
	" glass tube, . . . . .	.10
	" oz. can, . . . . .	.40
Magnesium , Powder, C.P.,	" 1-lb. "	1.25
	" 1/2 " "	2.15
	" 1 " "	4.00

(*) Poisonous!!

(†) Keep well stoppered or closed.

Magnesium , Ribbon,	{ per oz.,	\$0.75
	{ " lb.,	8.00
	{ " oz. bottle, . . . . .	.15
Mercury , Bichloride (<i>Corrosive Sublimate</i>), (*)	{ " 1-lb. " . . . . .	.30
	{ " 1/2 " " . . . . .	.55
	{ " 1 " "	1.00
	{ " oz. " . . . . .	.75
Metacarbol ,	{ " 1-lb. "	2.75
	{ " 1/2 " "	5.25
	{ " 1 " "	10.0
	{ " oz. " . . . . .	.75
Metol , (*)	{ " 1-lb. "	2.75
	{ " 1/2 " "	5.25
	{ " 1 " "	10.00
	{ " 6 cartridges,	1.20
	{ " oz. bottle, . . . . .	.75
Ortol ,	{ " 1-lb. "	2.75
	{ " 1/2 " "	5.25
	{ " 1 " "	10.00
Oil , Lavender (Garden),	" lb. bottle,	1.50
Paraffine ,	" lb. " . . . . .	.20
	" oz. bottle, . . . . .	.40
Paramidol ,	" 1-lb. "	1.40
	" 1/2 " "	2.65
	" 1 " "	5.00
	" oz. " . . . . .	.12
Potash , Caustic (<i>Potassium Hydrate</i>), (†)	" 1-lb. " . . . . .	.30
	" 1/2 " " . . . . .	.50
	" 1 " " . . . . .	.75
Potassium Bisulphite ,	" oz. " . . . . .	.25
	" oz. " . . . . .	.12
Potassium , Bromide,	" 1-lb. " . . . . .	.25
	" 1/2 " " . . . . .	.45
	" 1 " " . . . . .	.75
	" oz. " . . . . .	.15
" Bichromate,	" 1-lb. " . . . . .	.20
	" 1/2 " " . . . . .	.30
	" 1 " " . . . . .	.40
" Carbonate, (†)	" 1 " can, . . . . .	.20
	" 5 " " . . . . .	.90
" Chloro-platinite,	" 15-gr. bottle, . . . . .	.50
	" oz. "	11.00
" Cyanide, (*)	" 1-lb. " . . . . .	.35
	" 1 " " . . . . .	.60
	" 5 " can,	2.25
" Iodide,	" oz. bottle, . . . . .	.35
	" lb. "	3.40
	" oz. " . . . . .	.15
" Meta-bisulphite,	" 1-lb. " . . . . .	.35
	" 1/2 " " . . . . .	.60
	" 1 " "	1.00
" Oxalate,	" lb. carton, . . . . .	.20
	" 5-lb. " . . . . .	.90
	" 50 " bulk,	8.00
" Permanganate,	" oz. bottle, . . . . .	.15
" Prussiate, Red (<i>Ferri-cyanide</i>); . . . . . (†)	" " " . . . . .	.12
	" lb. " . . . . .	.80
" " Yellow (<i>Ferro-cyanide</i>),	" oz. " . . . . .	.12
	" lb. " . . . . .	.80
" Sulphocyanide (<i>Rhodanide</i>),	" oz. bottle, . . . . .	.15
	" 1-lb. " . . . . .	.35
	" 1/2 " " . . . . .	.60
	" 1 " "	1.10
	" 1 " " . . . . .	.28
Sulphuret (<i>Sulphide</i>),	" 5 " can, . . . . .	.90
	" 50 " "	6.50

(*) Poisonous!!

(†) Keep well stoppered.

<i>Pyrocatechin</i> ,	per oz. bottle,	\$0.60
<i>Pyroxyline</i> ,	1-lb. "	3.50
<i>Rochelle Salts</i> ,	1-oz. "	6.00
	1-lb. "	.55
	1-lb. "	.15
	1-lb. "	.40
<i>Rodinal</i> ,	3-oz. bottle,	.60
	8 "	1.10
	16 "	2.00
	oz. "	.50
<i>Silver</i> , Nitrate,	1-lb. "	2.20
	1-lb. "	4.00
	1-lb. "	8.00
	1-lb. "	.12
<i>Soda</i> , Caustic (<i>Sodium Hydrate</i>), (t)	1-lb. "	.30
	1-lb. "	.50
	1-lb. "	.75
	oz. "	.10
<i>Sodium</i> , Acetate,	1-lb. "	.30
" " doubly fused,	1-lb. "	.50
" Bicarbonate,	carton,	.12
	oz. bottle,	.15
" Bisulphite (<i>Acid Sulphite</i>),	1-lb. "	.20
	1-lb. "	.30
	1-lb. "	.40
" " " " Solution,	1 "	.50
" Bromide,	oz. "	.10
	lb. "	.60
" Carbonate,	" "	.18
" Citrate,	carton,	.08
	bottle,	.16
	carton,	.06
" Hyposulphite (<i>Hypo</i>),	oz. bottle,	.16
	keg,	3.00
" Iodide,	oz. bottle,	.40
" Nitrate,	" "	.12
" Sulphate (<i>Glauber's Salt</i>),	lb. "	.12
	lb. can,	.12
" Sulphite, (t)	5-lb. "	.50
	5 "	.40
	lb. "	.18
" " Granular,	5-lb. "	.75
	oz. bottle,	.10
" Phosphate (<i>Monobasic</i>),	1-lb. "	.15
	1-lb. "	.20
	1-lb. "	.30
	oz. "	.20
" " <i>Tribasic</i>),	1-lb. "	.30
	1-lb. "	.40
	1-lb. "	.50
" Tungstate,	oz., "	.15
<i>Strontium</i> , Chloride,	" "	.10
<i>Tannin</i> ,	lb. "	.80
	oz. "	.30
	1-lb. "	.75
<i>Thiocarbamid</i> ,	1-lb. "	2.75
	1-lb. "	5.25
	1-lb. "	10.00
	oz. "	.60
<i>Tolidol</i> ,	1-lb. "	4.50
	1-lb. "	8.00
	tubes for 20 oz. (speci-	
	fy brand of plate, time	.25
	or snap), . . . . .	.40
<i>Trenol</i> ,	per oz. bottle,	1.40
	1-lb. "	2.65
	1-lb. "	5.00
<i>Urantum</i> , Nitrate,	oz. "	.80
<i>Zinc</i> , Bromide, (t)	" "	.25
" Chloride,	" "	.20
" Iodide (t)	" "	.25

(*) Poisonous!! (t) Keep well stoppered.

Free Trip to Paris.

GRAND PRIZES. Class A.

Ray Camera Prize Contest for Amateur Photographers. 1900.

1st. For best set of 12 negatives, made from any of our different style cameras. Round Trip Ticket to Paris Exposition
2d. For second best set of 12 negatives, made from any of our different style cameras. One Hundred Dollars in Gold.

CLASSES.

B	C	D	E	F	G
Prizes open to all styles of 5 x 7 RAY CAMERAS.	Prizes open to 4 x 5 Folding RAY CAMERAS.	Prizes open to styles C, D, and E, 4 x 5 RAY CAMERAS.	Prizes open to 3 1/2 x 4 1/2 RAY CAMERAS.	Prizes open to 3 1/2 x 3 1/2 RAY CAMERAS.	Prizes open to 2 1/2 x 2 1/2 RAY CAMERAS.
Prize No. 1. For best set of 12 negatives: One No. 2, 5 x 7, Reversible back, Series 7, Long Focus, RAY CAMERA. \$60.00	Prize No. 1. For best set of 12 negatives: One No. 2, 4 x 5, Reversible back, Series 7, Long focus, RAY CAMERA. \$50.00	Prize No. 1. For best set of 12 negatives: One No. 1, Cycle Folding, Series 3, RAY CAMERA. \$25.00	Prize No. 1. For best set of 12 negatives: One No. 2, Cycle Folding, Series 2, RAY CAMERA. \$22.50	Prize No. 1. For best set of 12 negatives: One No. 3, Box Folding, Series 4, RAY CAMERA. \$14.00	Prize No. 1. For best set of 12 negatives: One Ray D, Size 4 x 5, RAY CAMERA. \$8.00
Prize No. 2. For second best set of 12 negatives: One No. 1, 5 x 7, Reversible back, Series 7, Long Focus, RAY CAMERA. \$35.00	Prize No. 2. For second best set of 12 negatives: One No. 1, 4 x 5, Reversible back, Series 7, Long focus, RAY CAMERA. \$30.00	Prize No. 2. For second best set of 12 negatives: One No. 1, Cycle Folding, Series 2, RAY CAMERA. \$20.00	Prize No. 2. For second best set of 12 negatives: One No. 4, Box Folding, Series 4, RAY CAMERA. \$16.00	Prize No. 2. For second best set of 12 negatives: One No. 3, Cycle Folding, Series 1, RAY CAMERA. \$10.00	Prize No. 2. For second best set of 12 negatives: One Ray C, Size 4 x 5, RAY CAMERA. \$5.00

Prizes in classes B, C, D, E, F, G, will be awarded as classified after the two Grand Prizes have been selected. No contestant will be awarded more than one prize. See further instructions on next page.

RAY CAMERA

Competitive

PHOTOGRAPHIC CONTEST

For Amateur Photographers.

The RAY CAMERA CO., of Rochester, N.Y., manufacturers of the famous Ray Cameras, desire to give every Amateur Photographer owning a Ray Camera a chance to secure

A Free Round Trip Ticket to the Paris Exposition in 1900,
One Hundred Dollars in Gold, or one of the prizes in Classes B, C, D, E, F, or G.

All entries for this contest must be made through a dealer in your town or city, of whom you may obtain a **Contest Card**, which must be filled out according to instructions, vouched for and *signed by yourself and dealer*, giving style and number of Ray Camera used. This card **must** be sent with all entries.

The entries to consist of the best set of negatives, twelve to a set, made from any style of Ray Cameras.

All negatives will be submitted to three competent judges, well known in the photographic world, who will make the awards.

No contestant will be recognized who sends negatives made by other than the Ray Cameras.

All negatives sent us during this contest are to remain our property for three months after the prizes have been awarded, which will be **January 1, 1900**, or as soon after as practicable.

All negatives must reach us not later than December 1, 1899.

They must be **carefully packed to prevent breakage**, and sent by **express, prepaid**, marked

RAY CAMERA CO.,
Rochester, N.Y., U.S.A.

Contest Department.

JUDGES.

We take pleasure in announcing that Mr. F. DUNDAS TODD, Chicago, Ill., Mr. A. H. GRIFFITH, Detroit, Mich., and Mr. JOHN E. DUMONT, Rochester, N.Y., have consented to act as judges. They are well known in the photographic world, and their names are a sufficient guarantee that the work will be intelligently judged, and that the most deserving competitors will carry off the prizes.

The Art of Photography.

A Guide for beginners in the Art of Photography and Instructions
for the use of Cameras.

INTRODUCTION.

Before trying to make any photographs, read the following instructions carefully, and make yourself thoroughly familiar with the instrument, taking especial care to learn the workings of the shutter. Work it for both time and instantaneous exposures several times until you are thoroughly familiar with it.

Before loading the camera, the first and most important thing for the amateur to bear in mind is that the sensitive plate must not be exposed to any but the ruby or orange light, even for a small fraction of a second, either before or after taking the picture, until it is developed and fixed in the hypo bath. Throughout all the operations of loading and unloading be careful that no light reaches the plate except the light from the ruby lantern. If success does not at first attend your attempt, do not be in a hurry to blame the camera, plates, or your solution for the failure. A little more perseverance will usually convince you that somewhere you have made a mistake.

THE DARK ROOM.

The dark room is used for unpacking the plates and loading the plate-holders, and developing them after exposure. The dark room does not mean a room with the door closed and light coming in through cracks in the door or elsewhere, but one absolutely dark, the light from the ruby lamp being the only light used. A common closet is the most practicable when the amateur has no special room for the purpose, as it is very easily made dark. A bath-room can be used by drawing the shades and hanging some heavy cloth over the window and stopping all cracks, so that no light can enter.

After the dark room has been secured, light your ruby lamp, securing the door to avoid interruption. Open the box of plates by cutting along the bottom of the box to allow the removal of the cover. Before putting in the dry plates, dust out the holder and dust off the plate with a camel's-hair brush, very lightly, being careful not to touch the face of the plate with the fingers. Do not brush the plate too briskly, or the plate will attract more dust than you brush off. Take a plate by the edges, *face or dull side* up. Press end of plate against spring at the end of the holder hard enough to allow the opposite end to slip into place. This leaves the right, or film, side of the plate out, on which exposures are made. If it is a double holder, replace the slide, and load the opposite side of the holder. After filling your holders, replace the cover on the box containing plates *before opening the door of the dark room*.

FIXED FOCUS HAND CAMERAS.

The following directions are written in reference to hand cameras of universal or fixed focus. In these cameras the lens is accurately set in a particular place, so

as to keep the image always in focus. Hence it is advisable never to tamper with the lens.

Place the holder in the camera, and you are ready for the first picture. Draw the slide straight up from the holder. Set the shutter, and point the camera toward the object, watching the view-finder at the same time. When the object appears in the right place on the finder, press the button, and the exposure is made. Replace slide in the holder straight, not cornerwise, or the plate will be light struck. If a single holder, replace it with another; if double, reverse and expose the other side.

INSTANTANEOUS EXPOSURES.

In making snap-shots, the subject should be in the sunlight, so as to get sufficient exposure. Always have the sun at your back. At least do not allow the sun to strike the lens, or fog will result. Hold the camera as still and as level as possible. Snap-shots can be made only in strong light, and *never* indoors.

TIME EXPOSURES.

In making exposures of this type, some support for the camera is necessary, as a tripod, table, chair, etc. If an interior is to be taken, be careful not to point the camera so as to include a window, or you will find in the negative a mass of light at that point obscuring everything in its vicinity. This difficulty is known as halation, and may be overcome by special non-halation plates. Exposure varies with the amount of light and the speed of the plates, a quick plate taking from 2 to 30 seconds, according to the light in the room. Rooms with light-colored wall-paper take less time than those with dark furnishings. Use the plate-holder exactly the same as for snap-shots.

DIAPHRAGMS OR STOPS.

The ordinary fixed focus cameras have three stops. The largest is the one used for most snap-shots. When taking water pictures, use the intermediate stop with the fastest speed of the shutter; and, for pictures including snow, it is even advisable to use the smallest.

If the shutter speed can be regulated, set the shutter on the low speeds if the light is weak.

For time exposures use a small stop, and it will add to the sharpness of the picture.

FOLDING CAMERAS, OR CAMERAS WITH ADJUSTABLE FOCUS.

The cameras of this type have a ground glass panel set in the back of the camera, upon which you may focus accurately, and a scale, marked in feet, which may be used instead of focussing on the glass. Suppose, for instance, you wish to photograph an object at 20 feet, set the index at the 20-foot mark, and the object is in focus. Draw out the slide, locate the object in the finder, and make the exposure.

Whenever the exposure is more than $\frac{1}{10}$ of a second, it is necessary to use the tripod. Set the shutter on time, press the lever or bulb to open the lens, and move the lens front, either by the hand or rack and pinion, until the object is clearest on the ground glass. It is usually necessary to cover the camera and the head with the focussing cloth, in order to focus sharply. This is usually made of

black velvet or gossamer cloth. Look *on* the ground glass, not through it. You will see the image inverted and reversed, right for left. Next close the shutter, and adjust it for the exposure desired. Put the plate-holder in its place, set the shutter, and expose either by bulb or finger release. Replace the slide, remove the holder, and you are ready for the next picture.

All lenses are fitted with stops or diaphragms which have definite sizes compared to the focal length of the lens. These are in two systems,—the F. system and the Uniform (U.S.), or number, system. In the F. system, each stop numbered F. 8, 16, 32, 64, etc., is one-half the diameter of the preceding stop, and consequently takes four times the exposure of the preceding one. In the Uniform system the numbers 4, 8, 16, 32, 64, 128, 256, are to each other as the areas. Therefore, each smaller stop takes twice the exposure of the next larger; *i.e.*, 4 seconds on stop No. 64 would be equivalent to 8 seconds on No. 128. The smaller stops, however, give greater depth of focus; that is, objects in different planes are in focus at the same time.

An exposure of $\frac{1}{100}$ second in bright sunlight with full opening is the approximate exposure for snap-shots. On cloudy days, $\frac{1}{25}$ second is necessary. With water views, use not over F./16 or No. 16 with the same exposure; while on snow views No. 64 is not too small. Interiors in a very bright room take from 20 seconds upwards with a No. 32 stop. Very dark rooms may take as many minutes.

DEVELOPMENT.

Prepare the developer for use before closing the dark-room door. Light the dark-room lantern, then close the door, and lock it, if possible. Remove the plate from the holder, and place it in the developing tray, face upwards. Throw the developer over the plate from one corner with a sweeping motion, so as to avoid air bubbles. If any of these are found, break them quickly with a light touch of the finger, or else you will find round spots on the film after fixing.

The image will appear in 20 or 30 seconds: if correctly exposed, the sky first and the shadows soon after; if over exposed, the whole plate will blacken rapidly, the shadows nearly as fast as the high lights. You will notice that the lightest parts of the pictures are blackest on the plate and *vice versa*, also that the right and left are interchanged. This is why the plate is now called a negative.

In general, the development should be continued until the image can be distinctly seen on the back of the plate. If the development is checked too soon, the detail is lost, and the negative lacks contrast. On the other hand, too long a development may fog the plate, and produce a long printing negative.

Instantaneous exposures require longer development than timed ones, and are richer in detail if the developer is diluted and the development much prolonged. It is well to keep a 10 per cent. solution of potassium bromide on hand—that is, a solution containing 1 ounce of the bromide to 10 of water—in order to control over-exposures. A few drops of this solution, or, in place of it, some old developer, will slow down the action of the fresh developer, and increase the contrast. Rinse well before fixing, and never spatter the *hypo* into the developer, as this will produce spots and fog.

It is impossible to make a general rule for development which will suit all developers. With pyro and potash, soda or ammonia, development is stopped when the image begins to disappear, or else fog results. Hydroquinone has but little tendency to fog.

ERRORS OF DEVELOPMENT AND EXPOSURES.

Too much contrast and no detail in shadows: dense black skies. || Under-exposure, too much bromide or cold developer.

Plate full of detail, no density, flat, and transparent brown color.	||	Over-exposure, lack of bromide, or developer too warm.
Weak negatives with detail, clear shadows, but lack of printing density.	||	Under-development.
Granular, very dense negatives, which require long printing.	||	Over-development.

Fog may result from white light striking the plate in loading, developing, or from leaks in camera or holders, too much alkali in the developer, hypo carried into developer by fingers, or too warm developer.

Spots.—Round, transparent air-bubbles or scum in development; angular spots, transparent dust on plate in exposure.

Stains are due to prolonged development, to decomposed sulphite, or developer carried by plates into hypo.

FIXING.

Make a solution of hypo containing 1 ounce of hypo to 4 of water. This is the fixing bath, which should always be used in one particular tray, and never allowed to get into the developer. While it is perfectly harmless in itself, it is fatal to the other solutions. Leave the plate in the hypo until the white silver bromide has cleared off, and the plate is transparent. At this state the plate is just half fixed. Nearly all the silver is yet in the film. Leave the plate in the bath for at least five minutes after the white has cleared from the back. If this is done, the washing afterwards completely frees the hypo. Rinse the plates between the developer and the fixing bath, or the bath will become loaded with decomposed developer, which prolongs the fixing bath and stains the plate.

Wash for at least two hours in running water. If the washing is too short, the hypo will crystallize on the surface of the plate, or cause stains, so as to ruin the plate.

INTENSIFICATION.

When a negative is weak, flat, or lacking in vigor, it is frequently much benefited by intensifying, in which case proceed as follows:—

Take sufficient amount of intensifier to cover the plate in a dish used only for that purpose. Then place the plate in the solution, taking care that the surface is entirely covered as quickly as possible. As soon as the film has attained an olive color, take the plate out for examination; and, if the film appears to be changed from the smoky-black color to a yellowish-olive color, wash the plate thoroughly, and place it on the rack to dry. When thoroughly dry, make a proof by printing from it, and compare with previous proof. If sufficient intensity is not obtained, repeat the operation.

Intensification may take place at once by fixing and washing, or at any subsequent time, at the pleasure of the operator.

The intensifier must be thoroughly washed from the film, otherwise the image will entirely disappear in time.

Intensifier may be made by the formula given under the head of Formulas, or can usually be purchased in a concentrated form of the dealer of whom you buy your accessories.

DIRECTIONS FOR PRINTING.

Place a printing frame with its springs upwards on the table, loosen the springs, and take out the backboard. Lay the negative film side up in the frame

and upon it place a piece of sensitized paper, face down, being careful not to scratch the sensitive side. Now place the backboard in position, latching carefully to avoid breaking the negative, turn the frame over and see if paper covers the negative properly. These operations may be performed in a moderate light, as the sensitized paper is not so extremely sensitive to light as is the dry plate. Set the frame in the sunlight, and examine the prints occasionally to see when they are printed deep enough; but do not do this in the strong light of the window, but step to one side where light is more subdued. Print about two shades deeper than required in finished print. Examine the print from time to time by opening one end of the printing frame, and turning the paper back, being careful not to move the paper. When the print is completed, it may be placed in a dark box or drawer until more are ready for toning.

TRIMMING.

The print should be neatly trimmed, taking off white edges caused by the printing frame.

The best and cheapest guide for trimming is the glass form, as, by its use, you can see where to trim to the best advantage. A great many use a trimming-board, which is made especially for trimming prints.

To trim with a glass form, place the print face up on a clean sheet of glass, and on the print place the glass form. Press down on the form with the left hand, and with the right cut along each edge of the form with a sharp knife. An ordinary pocket knife will answer; but a good shoemaker's knife, which costs but a trifle, is the best. The knife should be kept well-sharpened.

TONING.

Albumen paper for the past few years was the most popular paper for printing, but now it is almost entirely crowded out by the introduction of numerous brands of ready-prepared sensitized paper; and nearly all manufacturers of paper furnish a formula for toning with their different papers, and it is difficult to give specific directions which would apply to all. For instance, one manufacturer advises several changes of water before toning, while another one advises toning before washing. With each package of paper there is always enclosed specific instructions which it would be well to follow, as these directions are but general.

Nearly all manufacturers and dealers in photographic supplies put up a combined Toning and Fixing Solution, which will answer for nearly all papers, excepting matte surface, with which full directions come. Almost all glazed surface papers can be toned in combined baths, and, by observing the following instructions, you should obtain good results:—

Put the toning solution in one of the trays, and immerse the print face down and then face up, and repeat this while they are toning. Any number can be toned together if they are kept in motion and not allowed to lie together. The prints will begin to change color, from reddish-brown to reddish-yellow, then to purple. The change will be gradual, and the toning should be stopped when the desired tone is reached.

After toning, prints should be washed very thoroughly in clean water to remove any trace of hypo.

Unless thoroughly washed out, the hypo will cause a yellow tinge on white portion of picture, and finally cause print to fade. The length of time required to thoroughly wash a batch of prints depends on how frequently the water is changed. The water should be changed six or seven times, at intervals from five to fifteen minutes.

If it is desirable to shorten the time of washing, it is better to shorten the intervals between changing of water than to lessen the number of changes or to continually agitate the prints in the water. If you should tone your prints at night, as many do, you may allow prints to remain in washing water until morning, when they should be rinsed in two or three waters.

BLUE PRINT PROCESS.

This is the simplest of all photographic processes, and is valuable in making proofs from negatives, and also for printing snow and water views.

In printing, place the tinted side of the paper against the film, and print until the shadows take on a purplish color on an olive ground. Then wash in pure water, when the image changes to blue on a white ground. The proper depth can easily be ascertained after a few trials. Wash for half an hour, then dry between blotters. The prints dry darker.

MOUNTING.

After the prints are washed, they are ready for mounting on cardboard, or, as it is usually called, card mounts. This operation is very simple.

Remove the prints from the water, one by one, drain off all surplus water, and place in a pile, with face down, on clean sheet of glass. Apply a thin coat of paste to the back of the upper print, using a bristle brush for the purpose, and then place the print carefully on the card mount, working from the centre to the ends, so as to be free from air-bubbles.

Place a sheet of paper over the print to prevent it from becoming rubbed or torn, and rub the paper with palm of hand until the print lies perfectly smooth. One of the best articles for making a print lie smooth is a small print roller similar to a paper-hanger's roller, which you can obtain from any dealer in photographic supplies.

If the prints are not to be mounted at once, on leaving the water they should be dried; and when mounted subsequently, they should be thrown in clean water, until they lie perfectly flat, and then mount as usual. *Do not try to mount prints when dry.*

GLACÉ FINISH.

If you do not want to mount the prints, a very high polish may be given them by laying them down on a sheet of Ferrotypé plate, and rub lightly until they lie perfectly flat against the plate; and, when thoroughly dry, the print can be removed, and it will have a very glossy finish.

FLASH LIGHTS.

Magnesium Powder, for producing a brilliant artificial light for photographing, is now attracting wide attention: this very properly comes under the head of Instantaneous Photography.

There are many preparations in the market for producing the flash, all of which are based on explosives mixed with the Magnesium Powder to ignite it.

In photographing with the magnesium flash cartridges, you will need to focus by the aid of what light you can get from the gas jets or lamps; and, the focus being obtained, insert the plate-holder, and, when all is ready, draw the slide, open the shutter, and make the flash, closing the shutter immediately after.

If portraits are taken by flash light, it is advisable to have the room as brilliantly lighted as possible, as the brilliant flash is more apparent in a darkened

room, and is more apt to cause the sitter to close his eyes at the moment of exposure.

In photographing a group or in taking a portrait by flash light, it is best that none be looking directly at the flash; for, if the eyes do not close involuntarily, they are apt to have a strained appearance, best described as "staring."

A sheet of white cardboard held behind the cartridge will act as a reflector, and increase the strength of the picture.

Care should be taken that the cartridge is so placed as not to shine in the lens. It is well usually to place the light a little to one side of and above the camera.

The development of the plate is about the same as for any instantaneous exposure.

A FEW GENERAL HINTS.

See that all solutions are properly labelled.

Keep all solutions in bottles, well stoppered.

Lenses should always be kept carefully protected.

Keep plates in a cool, dry place, to prevent them from spoiling.

A quill pen makes a capital lifter for the plate during development.

A rubber stopper is preferable to one of cork, especially for ammonia.

Do not allow the camera or lens to remain in the sun when not in use.

Provide yourself with an extra ground-glass when going a long distance.

Prefer over-exposure to under-exposure, providing you can restrain your developer.

Keep ready sensitized paper in a box or drawer away from light and in a perfectly dry place.

In any view, expose for the darker parts of the view, leaving the better lighted portions to care for themselves.

If a glass stopper of a bottle be slightly smeared with vaseline, it will not stick to the bottle; and the latter is more nearly air-tight.

Occasionally wipe out the inside of the camera with a cloth, to remove dust, which by settling on the plate will cause pin-holes.

To make clean work, dust off the plates, after placing them in the holder, with a camel's-hair brush. Also dust out the holder frequently.

Before starting on a photographic tour, carefully look over your apparatus, and see that everything is in perfect order, and that nothing is missing.

If a plate be wet with clean water before the application of the developer, it will cause the developer to flow more readily and evenly over the surface.

In packing bottles for transportation, as may sometimes be required for a long trip, heavy rubber bands placed around them will prevent breakage.

In photographing in dimly lighted interiors, it is sometimes desirable to render the ground-glass more transparent. A very slight coat of glycerine on the ground service will have the desired effect.

Exercise care to locate the image perfectly straight on the ground-glass. Parallel vertical lines drawn on the ground-glass about one inch apart will aid in this. Some amateurs draw both vertical and horizontal lines.

When an amateur uses smaller plates in his holders than his camera is designed for, it is an excellent idea to mark on the centre of the ground-glass the shape and size of the plate: this will be an aid to him in making the size of the image correspond to the size of the plate.

The amateur should change as little as possible. Select the plates of some good maker; and, if you succeed with them, stick to them, and not go changing about. The same rule will also hold good with chemicals.

To produce the effect of a snow-storm, make a thin solution of Indian ink and water, dip a small stiff brush in this solution and splatter on the negative, taking care that the spray strikes the negative at the proper angle to give the effect of snow falling: do not hold the brush too close to the negative, as the spray is finer and is distributed more evenly if held at a distance.

When an amateur is on an extended trip and wishes to reserve the development of his plates until his return, one of the best receptacles for the exposed plates is their original box. The transfer from the holder to the box and *vice versa* may be effected in an ordinary room at night by drawing the curtains and making the room as dark as possible. In placing them in the box, take the plates from the holder, and place them face to face, with a piece of white tissue paper between the films. Around these wrap a piece of paper (orange-colored paper is the best, as it is to quite an extent non-actinic), and write on each side the nature of the view, length of exposure, etc., of the plate. Place them in the box, and treat those in the second holder the same way. When the box is filled, cover and wrap in paper, and write on it the word "exposed."

FORMULAS.

HYDROCHINON DEVELOPER.

Hydrochinon	¼ ounce.
Sulphite of Soda	1½ "
Meta-bisulphite of Potash	¼ "
Carbonate of Potash	1 "
Water	32 "

For over-exposed plates, add more water or use an old developer. In using Hydrochinon Developer, it is an excellent plan to have two mixed solutions, a fresh one for plates which have proper exposure, and an old one for over-exposed plates. If you think the plate may be over-exposed, commence with the old solution, and, if development proceeds slowly, transfer the plate to the new solution.

EIKONOGEN DEVELOPER.

Sulphite of Soda	4 ounces
Eikonogen	1 "
Glycerine	2 "
Carbonate of Potash	1 "
Carbonate of Soda	1 "
Water	32 "

Eikonogen Developer can be used over and over again, but, of course, must be kept in a separate bottle and well corked.

For plates which have had full exposure, use this developer diluted with about equal quantity of water. Strengthen from the stock solution as required.

After using this developer, put in separate bottle; and it can be used over and over again.

To dissolve Eikonogen, place it in an earthen bowl with the Sulphite of Soda and a portion of the water, and place the bowl in water, and bring it to a boiling point.

If the Eikonogen be finely powdered by means of a mortar and pestle, it will dissolve without heat by shaking.

Eikonogen Developer does not, as a rule, give as dense negatives as other developers.

If more density is required, after the detail is well out, transfer the plate to a tray containing water at about 70 degrees, and allow to soak for from three to five minutes.

INTENSIFYING SOLUTION.

No. 1.	
Bichloride of Mercury	60 grains.
Bromide of Potash	60 "
Water	6½ ounces.
No. 2.	
Sulphite of Soda	½ ounce.
Water	4 ounces.

Place the negative in solution No. 1 until bleached, then rinse and place in solution No. 2 until entirely cleared, after which the plate must be well washed. This operation may be repeated if sufficient density is not gained by first treatment.

SATURATED SOLUTION.

When any solid chemical is added to a liquid, the liquid will dissolve a certain amount of it. When it has dissolved all that it will, the solution thus formed is called a saturated solution. This can easily be told, as the portion not dissolved will remain in the bottom of the solution and refuse to become dissolved except by the addition of more liquid.

Pyro — Means Pyrogallic Acid.

Hypo — Means Hypo-sulphite of Soda.

PASTE FOR MOUNTING.

Starch, one ounce; water, eight ounces. Mix and heat over boiling water until turned: then add one-half ounce of glycerine. The paste so prepared keeps well in the warmest weather for about ten days, and in winter an indefinite time.

ANOTHER.

Arrowroot	3 drams.
Water	3 ounces.
Gelatine	15 grains.

Dissolve the gelatine in the water first: then add the arrowroot, and boil. When cool, add two drams of alcohol and a few drops of carbolic acid.

MOUNTING SOLUTION.

For Scrap-books, etc.

Nelson's Photographic Gelatine	2 ounces.
Water	8 "
Glycerine	½ "
Alcohol	3 "

Dissolve the gelatine in the water: then add the glycerine, and then the alcohol.

HOW TO PRINT A CRACKED NEGATIVE.

Either put printing frame at the bottom of a narrow box, two feet deep, with blackened sides, dropping a piece of light tissue paper over the frame, or suspend from a roasting jack a board upon which the printing frame can rest, the roasting jack acting all the time of the printing. No trace of the crack should be on the print.

DEVELOPMENT OF FILMS.

The development of films is similar to the development of plates, with the exception that after development they are treated with a soaking solution, which is composed of a half-ounce of glycerine well stirred in a pint of water. Soak the film in this solution five minutes, then remove, and wipe off the surplus moisture with a soft, damp cloth. If the IDEAL FILM HOLDER is used, the soaking solution is not necessary.

In unrolling the Cartridge System film for development, great care must be taken that the film is cut off in the right place. Unroll the film, and cut the exposures apart, as shown in Figure 1. In unrolling the film for development, care must be taken that the end is not allowed to roll up over the paper. The exposures should be cut apart with the paper on top. Figure 2 shows a Cartridge unrolling with the film on top. To correct this, simply turn back the film as indicated by the dotted lines, thus bringing the film under the paper.

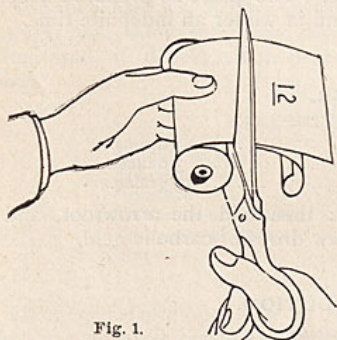


Fig. 1.

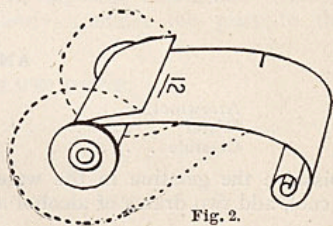


Fig. 2.

This does not hold for films from Cartridge roll holders. Before cutting be careful to unroll film to the junction of film and paper support, and place the film on paper in such a way that the perforations in the middle of the film correspond to the marks on the support between numbers 6 and 7. If this is not done, the negatives will be cut in two.

TABLES OF WEIGHTS AND MEASURES.

APOTHECARIES' WEIGHTS.

20 grains = 1 scruple	8 drachms = 1 ounce
3 scruples = 1 drachm	12 ounces = 1 pound

FLUID MEASURES.

60 minims = 1 fluid drachm	16 ounces = 1 pint
8 drachms = 1 fluid ounce	8 pints = 1 gallon

One fluid ounce of *water* weighs one ounce. These weights are usually adopted in formulae.

AVOIRDUPOIS WEIGHTS.

27 $\frac{1}{2}$ grains = 1 drachm
16 drachms = 1 ounce
16 ounces = 1 pound

These weights are used in selling chemicals. Liquid chemicals, such as acids, are *weighed*, not measured.

TROY WEIGHTS.

24 grains = 1 pennyweight
20 pennyweights = 1 ounce
12 ounces = 1 pound

Used in weighing precious metals.

METRIC SYSTEM.

Weights.

10 milligrams = 1 centigram	10 grams = 1 dekagram
10 centigrams = 1 decigram	10 dekagrams = 1 hectogram
10 decigrams = 1 gram	10 hectograms = 1 kilogram

Measures.

The volume which one gram of water occupies is called the cubic centimeter, and is the standard of fluid measures. Measures are usually expressed as cubic centimeters (cc.) and fractions, as 764.372 cc. 1,000 cc. is called one litre.

Lloyd's Table of Exposures.



In using the following exposure tables it should be remembered that the times of exposure given are only approximate, and that the terms "dark," "dull light," etc., are in a great way dependent upon the judgment of the operator.

It is obvious that the speeds like 1-384th part of a second and 1-200th part of a second, etc., are not possible speeds with the ordinary shutters excepting the focal plane, so it is necessary to stop the lens down by means of the diaphragm, in order to bring the exposure within range of the shutter.

These tables are computed for an aperture of f-8 or U. S. No. 4. If other stops are necessary in order to gain definition or to bring the exposures within the range of the shutter, it will be necessary to multiply the exposure figures by the number standing opposite the stop values in the following table.

If, for example, the exposure is desired on a Cramer Banner, with stop f-22 or No. 32, at 9 A.M. in May, brightest sun, etc., we look opposite f-22 or No. 32 and find 8; also opposite Cramer Banner and find $1\frac{1}{4}$. In table, brightest sun, no haze, for 9 A.M., May, we find $\frac{1}{8}$ second. Exposure is then $8 \times 1\frac{1}{4} \times \frac{1}{8} = \frac{5}{2} = \frac{1}{2}$ second, approximately.

f-8 = U. S. No. 4, multiply by 1.	f-22 = U. S. No. 32, multiply by 8.
f-11.5 = " " 8, " 2.	f-32 = " " 64, " 16.
f-16 = " " 16, " 4.	f-45 = " " 128, " 32.
f-64 = U. S. No. 256, multiply by 64.	

The result now obtained will be the correct exposure for the fastest plates, such as Crown, or Inst. Iso., Seed 27, Stanley, Hammer, etc. If other plates are to be used, multiply ALSO by the number opposite the following plate table.

1. Cramer Crown, and Inst. Iso., Seed 27, Hammer fastest, Eastman Red Label and films, Stanley 50.
- 1½. Cramer Banner, Seed 26 x, Carbutt's Eclipse, Jr., Climax extra, Record, Stanley 35.
- 1¾. Carbutt's Ortho 23, Climax 50.
2. Eastman Yellow Label, Carbutt's Spec. 25.
- 2½. Seed 23, Cramer Med. Iso., Crescent, Cramer Anchor, Hammer slowest.
12. Cramer Iso., slow.
20. Carbutt B, No. 16.

BRIGHTEST SUN, NO HAZE.

Ordinary subjects, foreground and sky.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{40}$
February October			$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{64}$
March September		$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{48}$	$\frac{1}{64}$
April August		$\frac{1}{12}$	$\frac{1}{48}$	$\frac{1}{48}$	$\frac{1}{64}$	$\frac{1}{96}$
May to July, inclusive	$\frac{1}{4}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{48}$	$\frac{1}{64}$	$\frac{1}{96}$

Landscapes with small foregrounds, mostly distance. Light-colored objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{4}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{80}$
February October			$\frac{1}{16}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{128}$
March September		$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{96}$	$\frac{1}{128}$
April August		$\frac{1}{24}$	$\frac{1}{96}$	$\frac{1}{96}$	$\frac{1}{128}$	$\frac{1}{192}$
May to July, inclusive	$\frac{1}{8}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{96}$	$\frac{1}{128}$	$\frac{1}{192}$

Water views, snow pictures, or subjects with extreme distance.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{8}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{160}$
February October			$\frac{1}{32}$	$\frac{1}{96}$	$\frac{1}{192}$	$\frac{1}{256}$
March September		$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{192}$	$\frac{1}{256}$
April August		$\frac{1}{48}$	$\frac{1}{192}$	$\frac{1}{192}$	$\frac{1}{256}$	$\frac{1}{384}$
May to July, inclusive	$\frac{1}{16}$	$\frac{1}{96}$	$\frac{1}{192}$	$\frac{1}{192}$	$\frac{1}{256}$	$\frac{1}{384}$

For sky and cloud pictures.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{16}$	$\frac{1}{96}$	$\frac{1}{192}$	$\frac{1}{320}$
February October			$\frac{1}{64}$	$\frac{1}{192}$	$\frac{1}{384}$	$\frac{1}{512}$
March September		$\frac{1}{32}$	$\frac{1}{128}$	$\frac{1}{256}$	$\frac{1}{384}$	$\frac{1}{512}$
April August		$\frac{1}{96}$	$\frac{1}{384}$	$\frac{1}{384}$	$\frac{1}{512}$	$\frac{1}{768}$
May to July, inclusive	$\frac{1}{32}$	$\frac{1}{192}$	$\frac{1}{384}$	$\frac{1}{384}$	$\frac{1}{512}$	$\frac{1}{768}$

Portraits out of doors, dark objects, yellow and red objects,
subjects at short range.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			1	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{20}$
February October			$\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{32}$
March September		$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{24}$	$\frac{1}{32}$
April August		$\frac{1}{6}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{32}$	$\frac{1}{48}$
May to July, inclusive	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{32}$	$\frac{1}{48}$

BRIGHT SUN.

Ordinary subjects, half foreground and half sky.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{27}$
February October			$\frac{1}{5}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{42}$
March September		$\frac{3}{8}$	$\frac{1}{10}$	$\frac{1}{21}$	$\frac{1}{32}$	$\frac{1}{42}$
April August		$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{42}$	$\frac{1}{64}$
May to July, inclusive	$\frac{3}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{42}$	$\frac{1}{64}$

Landscapes, mostly distance, with small foregrounds. Light-colored
objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{3}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{53}$
February October			$\frac{1}{10}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{85}$
March September		$\frac{1}{5}$	$\frac{1}{21}$	$\frac{1}{43}$	$\frac{1}{64}$	$\frac{1}{85}$
April August		$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{64}$	$\frac{1}{85}$	$\frac{1}{128}$
May to July, inclusive	$\frac{1}{5}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{64}$	$\frac{1}{85}$	$\frac{1}{128}$

Water views, snow pictures, or subjects with extreme distance.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{3}{16}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{106}$
February October			$\frac{1}{21}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{170}$
March September		$\frac{1}{11}$	$\frac{1}{42}$	$\frac{1}{85}$	$\frac{1}{128}$	$\frac{1}{170}$
April August		$\frac{1}{32}$	$\frac{1}{128}$	$\frac{1}{128}$	$\frac{1}{170}$	$\frac{1}{256}$
May to July, inclusive	$\frac{1}{11}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{128}$	$\frac{1}{170}$	$\frac{1}{256}$

Sky and cloud pictures.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{11}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{213}$
February October			$\frac{1}{42}$	$\frac{1}{128}$	$\frac{1}{256}$	$\frac{1}{341}$
March September		$\frac{1}{21}$	$\frac{1}{85}$	$\frac{1}{170}$	$\frac{1}{256}$	$\frac{1}{341}$
April August		$\frac{1}{64}$	$\frac{1}{256}$	$\frac{1}{256}$	$\frac{1}{341}$	$\frac{1}{512}$
May to July, inclusive	$\frac{1}{21}$	$\frac{1}{128}$	$\frac{1}{256}$	$\frac{1}{256}$	$\frac{1}{341}$	$\frac{1}{512}$

Portraits out of doors, dark objects, yellow and red objects,
subjects at short range.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$1\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{12}$
February October			$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{21}$
March September		$\frac{3}{4}$	$\frac{3}{16}$	$\frac{1}{11}$	$\frac{1}{16}$	$\frac{1}{21}$
April August		$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{21}$	$\frac{1}{32}$
May to July, inclusive	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{21}$	$\frac{1}{32}$

SUN OBSCURED.

Ordinary subjects, about half foreground and half sky.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			1	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{20}$
October February			$\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{32}$
September March		$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{24}$	$\frac{1}{32}$
August April		$\frac{1}{6}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{32}$	$\frac{1}{48}$
May to July, inclusive	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{32}$	$\frac{1}{48}$

Landscapes, mostly distance, with small foregrounds. Light-colored
objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{40}$
February October			$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{64}$
March September		$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{48}$	$\frac{1}{64}$
April August		$\frac{1}{12}$	$\frac{1}{48}$	$\frac{1}{48}$	$\frac{1}{64}$	$\frac{1}{96}$
May to July, inclusive	$\frac{1}{4}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{48}$	$\frac{1}{64}$	$\frac{1}{96}$

Water views, snow scenes, or subjects with extreme distance.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{4}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{80}$
October February			$\frac{1}{16}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{128}$
September March		$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{96}$	$\frac{1}{128}$
August April		$\frac{1}{24}$	$\frac{1}{96}$	$\frac{1}{96}$	$\frac{1}{128}$	$\frac{1}{192}$
May to July, inclusive	$\frac{1}{8}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{96}$	$\frac{1}{128}$	$\frac{1}{192}$

Sky and cloud pictures.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{8}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{160}$
February October			$\frac{1}{32}$	$\frac{1}{96}$	$\frac{1}{192}$	$\frac{1}{256}$
March September		$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{192}$	$\frac{1}{256}$
April August		$\frac{1}{48}$	$\frac{1}{192}$	$\frac{1}{192}$	$\frac{1}{256}$	$\frac{1}{384}$
May to July, inclusive	$\frac{1}{16}$	$\frac{1}{96}$	$\frac{1}{192}$	$\frac{1}{192}$	$\frac{1}{256}$	$\frac{1}{384}$

Portraits out of doors, dark, yellow, or red objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			2	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{10}$
February October			$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{16}$
March September		1	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{12}$	$\frac{1}{16}$
April August		$\frac{1}{3}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{16}$	$\frac{1}{24}$
May to July, inclusive	1	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{16}$	$\frac{1}{24}$

DULL.**Ordinary subjects, half foreground and half sky.**

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{3}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{13}$
February October			$\frac{2}{5}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{20}$
March September		$\frac{3}{4}$	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{16}$	$\frac{1}{21}$
April August		$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{20}$	$\frac{1}{32}$
May to July, inclusive	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{20}$	$\frac{1}{32}$

Landscapes with small foregrounds. Light-colored objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{25}$
February October			$\frac{1}{5}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{40}$
March September		$\frac{3}{8}$	$\frac{1}{10}$	$\frac{1}{20}$	$\frac{1}{32}$	$\frac{1}{40}$
April August		$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{40}$	$\frac{1}{64}$
May to July, inclusive	$\frac{3}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{40}$	$\frac{1}{64}$

Water views, snow pictures, or subjects with extreme distance.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{3}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{53}$
February October			$\frac{1}{10}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{85}$
March September		$\frac{1}{5}$	$\frac{1}{20}$	$\frac{1}{43}$	$\frac{1}{64}$	$\frac{1}{85}$
April August		$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{64}$	$\frac{1}{85}$	$\frac{1}{128}$
May to July, inclusive	$\frac{1}{5}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{64}$	$\frac{1}{85}$	$\frac{1}{128}$

Sky and cloud pictures.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{3}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{106}$
February October			$\frac{1}{21}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{170}$
March September		$\frac{1}{11}$	$\frac{1}{42}$	$\frac{1}{85}$	$\frac{1}{128}$	$\frac{1}{170}$
April August		$\frac{1}{32}$	$\frac{1}{128}$	$\frac{1}{128}$	$\frac{1}{170}$	$\frac{1}{256}$
May to July, inclusive	$\frac{1}{11}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{128}$	$\frac{1}{170}$	$\frac{1}{256}$

Portraits out of doors, dark objects, yellow or red objects, subjects at short range.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			3	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{7}$
February October			$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{11}$
March September		$1\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{5}$	$\frac{1}{8}$	$\frac{1}{11}$
April August		$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{11}$	$\frac{1}{15}$
May to July, inclusive	$1\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{11}$	$\frac{1}{16}$

VERY DULL.**Ordinary subjects, half foreground and half sky.**

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			2	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{10}$
February October			$\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{16}$
March September		1	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{12}$	$\frac{1}{16}$
April August		$\frac{1}{3}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{16}$	$\frac{1}{24}$
May to July, inclusive	1	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{16}$	$\frac{1}{24}$

Landscapes, with small foregrounds. Light-colored objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			1	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{20}$
February October			$\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{32}$
March September		$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{24}$	$\frac{1}{32}$
April August		$\frac{1}{6}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{32}$	$\frac{1}{48}$
May to July, inclusive	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{32}$	$\frac{1}{48}$

Snow scenes, sea views, extremely distant views.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{40}$
February October			$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{64}$
March September		$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{48}$	$\frac{1}{64}$
April August		$\frac{1}{12}$	$\frac{1}{48}$	$\frac{1}{48}$	$\frac{1}{64}$	$\frac{1}{96}$
May to July, inclusive	$\frac{1}{4}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{48}$	$\frac{1}{64}$	$\frac{1}{96}$

Sky and cloud pictures.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			$\frac{1}{4}$	$\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{80}$
February October			$\frac{1}{16}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{128}$
March September		$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{96}$	$\frac{1}{128}$
April August		$\frac{1}{24}$	$\frac{1}{96}$	$\frac{1}{96}$	$\frac{1}{128}$	$\frac{1}{192}$
May to July, inclusive	$\frac{1}{8}$	$\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{96}$	$\frac{1}{128}$	$\frac{1}{192}$

Portraits out of doors, dark, yellow, or red objects.

	5 A.M. 7 P.M.	6 A.M. 6 P.M.	7 A.M. 5 P.M.	8 A.M. 4 P.M.	9 A.M. 3 P.M.	10 A.M. 2 P.M.
November to January, inclusive			4	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{1}{5}$
February October			1	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{8}$
March September		2	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{8}$
April August		$\frac{2}{3}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{1}{12}$
May to July, inclusive	2	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{1}{12}$

APPROXIMATE EXPOSURES
WITH SNAP-SHOT OR FIXED FOCUS
HAND CAMERAS.

Box cameras of this type, like the Ray, Bull's-eye, Gem, etc., have an approximate speed of $\frac{1}{25}$ of a second, and are generally fitted with three apertures, which are approximately F. 16, F. 22, and F. 32. These are designated in the following tables as large, medium, and small. The spaces in the table contain the stops necessary when the shutter is used for snap shots. When longer exposures are necessary, the time is given in addition to the stop. As the shutter speed and apertures in different makes of cameras vary, it will be seen that these are only approximate exposures, and are merely offered as a guide.

SUMMER.

Speed of shutter, approximately $\frac{1}{25}$ second.

	11 A.M. to 1 P.M.	10 A.M. to 2 P.M.	9 A.M. to 3 P.M.	8 A.M. to 4 P.M.	7 A.M. to 5 P.M.
Brightest Sun. Ordinary landscape.	Large.	Large.	O	O	O
Brightest Sun. Water views or subjects with no heavy shadows.	Med.	Med.	Large.	Large.	O
Sun Obscured. Ordinary landscape.	Small stop. Quickest time.	Med. stop. Quickest time.	Med. stop. Quickest time.	Large stop. Quickest time.	Small stop. 1 to 2 sec.
Sun Obscured. Water pictures or subjects with no heavy shadows.	Med.	Large.	Large.	O	O
Interiors.	Small. 20 to 60 sec.	Small. 30 to 90 sec.	Small. 40 to 120 sec.	Small.	Small.
Ray Multiplying Pictures.	Large. $\frac{1}{2}$ sec. to 1 sec.	Large. $\frac{2}{3}$ sec. to 1 $\frac{1}{2}$ sec.	Large. 1 sec. to 2 sec.	Large. 1 sec. to 2 sec.	Large.

WINTER.

Speed of shutter, approximately $\frac{1}{25}$ second.

	11 A.M. to 1 P.M.	10 A.M. to 2 P.M.	9 A.M. to 3 P.M.	8 A.M. to 4 P.M.	7 A.M. to 5 P.M.
Brightest Sun. Ordinary landscape.	Large.	Small. $\frac{1}{4}$ sec.	Small. $\frac{1}{2}$ sec.	Small. $\frac{2}{3}$ sec.	Small. 1 sec.
Brightest Sun. Water views, etc.	Med.	Large.	Large.	O	O
Brightest Sun. Snow pictures.	Small.	Med.	Med.	Med.	Large.
Sun Obscured. Ordinary landscape.	Small. $\frac{1}{2}$ sec. to 1 sec.	Small. $\frac{2}{3}$ sec. to 1 $\frac{1}{2}$ sec.	Small. 1 to 2 sec.	Small. 2 to 4 sec.	Small. 4 to 6 sec.
Sun Obscured. Water pictures.	Large.	Large.	O	O	O
Sun Obscured. Snow pictures.	Med.	Large.	Large.	O	O

ENLARGEMENTS.

From the British Journal of Photography Almanac.

FOCUS OF LENS.	TIMES OF ENLARGEMENT AND REDUCTION.							
	1	2	3	4	5	6	7	8
Inches.	Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
2	4 4	6 3	8 $2\frac{2}{3}$	10 $2\frac{1}{2}$	12 $2\frac{2}{3}$	14 $2\frac{1}{3}$	16 $2\frac{2}{3}$	18 $2\frac{1}{2}$
2 $\frac{1}{2}$	5 5	7 $\frac{1}{2}$ $3\frac{1}{2}$	10 $3\frac{1}{3}$	12 $\frac{1}{2}$ $3\frac{1}{2}$	15 3	17 $\frac{1}{2}$ $2\frac{2}{3}$	20 $2\frac{2}{3}$	22 $\frac{1}{2}$ $2\frac{1}{3}$
3	6 6	9 $4\frac{1}{2}$	12 4	15 $3\frac{3}{4}$	18 $3\frac{3}{4}$	21 $3\frac{1}{2}$	24 $3\frac{3}{4}$	27 $3\frac{3}{4}$
3 $\frac{1}{2}$	7 7	10 $\frac{1}{2}$ $5\frac{1}{4}$	14 $4\frac{2}{3}$	17 $\frac{1}{2}$ $4\frac{1}{2}$	21 $4\frac{1}{2}$	24 $\frac{1}{2}$ $4\frac{1}{2}$	28 4	31 $\frac{1}{2}$ $3\frac{1}{3}$
4	8 8	12 6	16 $5\frac{1}{3}$	20 5	24 $4\frac{2}{3}$	28 $4\frac{2}{3}$	32 $4\frac{1}{2}$	36 $4\frac{1}{2}$
4 $\frac{1}{2}$	9 9	13 $\frac{1}{2}$ $6\frac{3}{4}$	18 6	22 $\frac{1}{2}$ $5\frac{1}{2}$	27 $5\frac{1}{2}$	31 $\frac{1}{2}$ $5\frac{1}{4}$	36 $5\frac{1}{2}$	40 $\frac{1}{2}$ $5\frac{1}{3}$
5	10 10	15 $7\frac{1}{2}$	20 $6\frac{2}{3}$	25 $6\frac{1}{2}$	30 6	35 $5\frac{2}{3}$	40 $5\frac{1}{2}$	45 $5\frac{1}{3}$
5 $\frac{1}{2}$	11 11	16 $\frac{1}{2}$ $8\frac{1}{4}$	22 $7\frac{1}{3}$	27 $\frac{1}{2}$ $6\frac{1}{2}$	33 $6\frac{1}{2}$	38 $\frac{1}{2}$ $6\frac{1}{2}$	44 $6\frac{1}{2}$	49 $\frac{1}{2}$ $6\frac{1}{3}$
6	12 12	18 9	24 8	30 $7\frac{1}{2}$	36 $7\frac{1}{2}$	42 7	48 $6\frac{2}{3}$	54 $6\frac{1}{2}$
7	14 14	21 $10\frac{1}{2}$	28 $9\frac{1}{3}$	35 $8\frac{1}{4}$	42 $8\frac{2}{3}$	49 $8\frac{1}{3}$	56 8	63 $7\frac{1}{2}$
8	16 16	24 12	32 $10\frac{2}{3}$	40 10	48 $9\frac{2}{3}$	56 $9\frac{1}{3}$	64 $9\frac{1}{2}$	72 9
9	18 18	27 $13\frac{1}{2}$	36 12	45 $11\frac{1}{2}$	54 $10\frac{2}{3}$	63 $10\frac{1}{2}$	72 $10\frac{2}{3}$	81 $10\frac{1}{2}$

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical centre. The use of the table will be seen from the following illustration: a photographer has a *carte* to enlarge to four times its size, and the lens he intends employing is one of six inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 in the first vertical column, and carry his eye to where these two join, which will be at 30- $7\frac{1}{2}$. The greater of these is the distance the sensitive plate must be from the centre of the lens; and the lesser, the distance of the picture to be copied. To reduce a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be twelve inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

COMPARATIVE EXPOSURES FOR ENLARGING AND REDUCING.

Compiled by Mr. E. Ferrero (Camera Club, London).

Table with 13 columns (f/16 to f/52) and 13 rows (m. s. to 4 30) showing exposure values for various focal lengths.

COMPARATIVE EXPOSURES FOR ENLARGING AND REDUCING.—Continued.

Table with 12 columns (f/56 to f/100) and 13 rows (m. s. to 54 0) showing exposure values for various focal lengths.

DR. WOODMAN'S TABLE OF VIEW ANGLES.

DIVIDE THE BASE OF THE PLATE BY THE EQUIVALENT FOCUS OF THE LENS.

Table with 6 columns (If the quotient is, The angle is) and 40 rows showing view angles for different quotient values.

This table has been calculated for the use of those who wish to know the precise angle of view included by any particular lens on a given size of plate. Its mode of use will be easily seen by inspection.

SIZES OF DRY PLATES MADE IN FRANCE AND GERMANY.

Table listing sizes of dry plates in centimeters and inches, such as 6 1/2 x 9 c. m. and 2.5 x 3.6 inches.

SIZES OF DRY PLATES MADE IN ITALY.

Table listing sizes of dry plates in centimeters and inches, such as 9 x 12 c. m. and 3.6 x 4.7 inches.

EQUATIONS RELATING TO FOCI, ETC.

The following simple optical formulæ and calculations, worked out by Mr. J. A. C. Branfill, will prove useful in many branches of photography, especially where several lenses of varying foci are in constant use for a variety of purposes:—

- Let p = Principal focus.
- F = Greater conjugate focus.
- f = Lesser do. do.
- $D = F + f$ = distance of image from object.
- r = Ratio of any dimension in original to the same dimension in copy (in case of reduction), or *vice versa* (in case of enlargement).
- a = Effective diameter of diaphragm.
- U. S. No. = "Uniform System" No. of do.
- x = Comparative exposure required.

Then $p = D \times \frac{r}{(r+1)^2} = \frac{Ff}{D} = \frac{F}{r+1} = \frac{rf}{r+1}$

$F = p(r+1) = \frac{pf}{f-p} = rf = \frac{rD}{r+1}$

$f = p \times \frac{(r+1)}{r} = \frac{pF}{F-p} = \frac{D}{r+1} = \frac{p}{r}$

$D = p \times \frac{(r+1)^2}{r} = f(r+1) = p \left(2 + r + \frac{1}{r} \right)$

$r = \frac{F-p}{p} = \frac{p}{f-p} = \frac{F}{f}$

U. S. No. = $\frac{p^2}{16 a^2}$

$x = \frac{f^2}{16 a^2} = \frac{p^2}{16 a^2} \times \frac{(r+1)^2}{r^2}$

N.B.—For ordinary landscape work, where r is greater than 20, x may be taken as $\frac{p^2}{16 a^2}$

NOTE.—In case the above may not be clear to some photographers, the following rules may be better understood:—
To find the principal focus of a lens (p), focus a near object in the camera, and measure the distance between it and the ground-glass (D); next find the proportion which any dimension in the object bears to the same dimension on the ground-glass (r). Thus, if the original dimension be four times as large as its reproduction, we say that r equals (=) 4. Multiply D by r , and divide the product by the square of a number greater by one than r , ($r+1$)². This rule was lately published by Mr. Debenham.

To find the lesser conjugate focus (f) (if p and r are known), multiply p by the sum of $r+1$, and divide the product by r . Or divide D by $r+1$.

To find the greater conjugate focus (F), multiply p by $r+1$. Or multiply f by r .

To find D (the distance which the ground-glass should be from the object to be copied in order to get a given value for r), multiply p by the sum of $r + \frac{1}{r} + 2$.

To find r , divide $F-p$ (the difference between F and p) by p . Or divide p by $f-p$. Or divide F by f .

To find x , divide the square of f by 16 times the square of a (the diameter of aperture to lens).

For example: Focus an object which is five inches high, so that it is one inch high on the ground-glass: thus we know that $r = 5$. Next measure the distance between the object and the ground-glass (D), which is found to be 45 inches.

Then $p = 45 \times (\text{multiplied by } 5 \div (\text{divided by } 6 \times 6 = 64) = 64$ inches.

$f = 64 \div 6 = 10 \frac{2}{3} = 10 \frac{4}{6} = 10 \frac{2}{3}$ inches. Or $f = 45 \div 5 = 9$ inches.

$F = 64 \times 5 = 320$ inches. Or $F = 9 \times 5 = 45$ inches.

$D = 64 \times (5 + \frac{1}{5} + 2) = 64 \times 7 \frac{1}{5} = 45$ inches.

$r = (37 \frac{1}{5} - 64) \div 64 = 5$. Or $r = 64 \div (7 \frac{1}{5} - 64) = 5$.

Formulas and Tables used in Photography.

DRY PLATE DEVELOPERS.

Pyrogallol.

Climax Plate.

No. 1.

Pyro	1 ounce.
Water	6 ounces.
Sulphuric acid	10 drops.

No. 2.

Sulphite of soda (crystals)	6 ounces.
Sal-soda	4 "
Water	15 "

Dissolve and filter.

To develop.

For normal exposure, take 2 drachms No. 1, add 1 ounce No. 2, water 6 ounces.

If more contrast is required, increase the amount of No. 1; if less, more of No. 2.

BY HYDROMETER TEST.

No. 1.

Pyro	1 ounce.
Sulphuric acid	10 drops.
Water	12 ounces.

No. 2.

Equal parts of carbonate (sal) soda, test 40°, and sulphite soda, test 60°.

To develop.

Take No. 1, $\frac{1}{2}$ ounce; No. 2, 2 ounces; water from 4 to 6 ounces.

In cold weather use less water.

Cramer Plates.

Alkaline Solution.

Carbonate of sodium crystals (sal-soda)	5 ounces.
Sulphite of sodium crystals	10 "
Water	60 "

A smaller quantity of sulphite will produce a warmer tone, a larger quantity a gray or bluish-black tone.

The alkaline solution must be kept in well-stoppered bottles.

If the negatives show yellow stain, make a fresh solution, or try another lot of sulphite of sodium.

To prepare the alkaline solution with the hydrometer, mix equal parts of the following solutions:

Carbonate of sodium solution (hydrometer test 40°).

Sulphite of sodium solution (hydrometer 80°).

Pyro Solution.

Dissolve 1 drachm sulphite of sodium crystals in 6 ounces distilled or pure ice-water, add acetic acid until the solution turns blue litmus paper red, and finally add 1 ounce pyrogallic acid.

Mix in the following proportions:

Pyro solution	1 drachm.
Alkaline solution	1 ounce.
Tepid water (for winter use) or	2 ounces.
Cold water (for summer use)	3 to 5 "

If the high lights are flat, use more pyro solution.

If they are too intense, use less pyro solution.

If too little pyro is used, the alkali will be in excess, and cause fog.

For Transparencies.

Sulphite of soda	8 ounces.
Carbonate of soda (crystals)	2½ "
Bromide of potassium	30 grains.
Water	64 ounces.

To every ounce of this solution add 3 to 5 grains of dry pyro. An excess of pyro will yield slides too heavy in the shadows and lacking in detail in the high lights.

Carbutt's.

No. 1.

Pyro Stock Solution.

Oxalic acid	15 grains or 1 gram.
Bromide of potassium	30 " " 2 grams.
Distilled or ice-water	10 ounces " 300 ccm.

Then add Schering's pyro, 1 ounce (30 grams), and water to make 16 fluid ounces (480 cc.).

No. 2.

Soda Stock Solution.

Sodium sulphite (crystals)	4 ounces or 120 grams.
Soda carb. crystals (or dry gran. 1 ounce)	2 " " 60 "
Potash carbonate	1 ounce " 30 "
Water	10 ounces " 300 ccm.

Dissolve, and add water to make measure 16 fluid ounces (480 cc.).

No. 3.

Bromide Solution.

Bromide of sodium or potassium, ½ ounce (14 grams). Water, 5 ounces (150 cc.).

For Developer.

Dilute 2 ounces of stock No. 2 with 7 ounces of water for cold weather, and 10 to 12 of water in summer. To 3 ounces of dilute No. 2, add 1½ to 2½ drachms (6 to 10 cc.) of No. 1. The more pyro, the denser the negative, and *vice versa*. No yellowing or fogging need be apprehended, if the directions are followed. Development should be continued until the image seems almost buried, then wash and place in fixing bath.

For instantaneous exposures take for a 5 x 8 or 6½ x 8½ plate 3 ounces of dilute No. 2. Lay the plate to soak in this, and cover pan. Put 2 drachms of No. 1 into the graduate, and 3 drops of bromide solution. Pour the soda solution off of the plate into the pyro and back over the plate: let development proceed, and examine occasionally. Keep solution in gentle motion over the plate. A *very*

short exposure may take ten minutes to fully develop. If the image is not fully brought out by this time, add to developer in pan three times its bulk of water, and let plate lie in it covered for half an hour or more, if necessary, until full development is attained, then wash, and proceed as directed under head of developer.

Hammer.

The two following pyrogallic acid formulas are recommended, if strong, vigorous negatives are wanted. The quantity of sulphite of soda in the developer must be regulated to produce the color desired. If a developer, made according to either formula, produces negatives too cold and gray in tone, reduce the amount of sulphite until the quantity is found that produces the best color or tone. In many cases it may be reduced one-half and produce better results: in some cases it may even have to be increased. This is regulated entirely by local conditions, such as quality of the water, condition of the sulphite soda, etc.

Pyrogallic Acid Developer, with Carbonate of Soda.

No. 1.

Sulphite soda (crystals)	5 ounces or 150 grams.
Carbonate soda (crystals)	2½ " " 75 "
Pure water	30 " " 900 ccm.

No. 2.

Oxalic acid	15 grains or 1 gram.
Pyrogallic acid	1 ounce " 30 grams.
Pure water	24 ounces " 720 ccm.

To develop, take:

Solution No. 1	1 ounce or 30 ccm.
Solution No. 2	½ " " 15 "
Pure water	3 ounces " 90 "

More water may be used in warm weather, and less in cool weather.

See that the developing solutions are not too cold in cold weather, nor too warm in warm weather. This applies to all developers.

If Solution No. 1 is made by hydrometer test, use equal parts of the following:

Sulphite soda testing	80°
Carbonate soda testing	40°

One ounce of this mixture will be equivalent to one ounce of Solution No. 1.

Pyrogallic Acid Developer, with Carbonate Potassium.

No. 1.

Sulphite soda (crystals)	8 ounces or 240 grams.
Carbonate potassium, <i>dry</i>	1 ounce " 30 "
Pure water	32 ounces " 960 ccm.

No. 2.

Oxalic acid	15 grains or 1 gram.
Pyrogallic acid	1 ounce " 30 grams.
Pure water	24 ounces " 720 ccm.

To develop, take:

Solution No. 1	1 ounce or 30 ccm.
Solution No. 2	½ " " 15 "
Pure water	3 ounces " 90 "

When the plate is fully developed, if the high lights are too thin, use less water in the developer; if too dense, use more water.

American.

No. 1.

Pyrogallic acid	1 ounce.
Sulphite of sodium (crystals)	60 grains.
Sulphuric acid, C. P.	15 minims.
Water	6 ounces.

No. 2.

Sulphite of sodium (crystals)	2 ounces.
Sal-soda	1 ounce.
Water	40 ounces.

To develop, use No. 1, 1 dram; No. 2, 4 ounces. For more density, use more of No. 1; for more detail, more of No. 2.

BY HYDROMETER TEST.

Make sulphite of soda solution to test 30; make sal-soda solution to test 10; mix together in equal parts. To develop, take pyro solution as in previous formula, 1 drachm; soda solution, 4 ounces.

Eastman (for films).

No. 1.

Pyrogallic acid	½ ounce.
Nitrous or sulphurous acid	20 minims.
Water	32 ounces.

No. 2.

Sulphite of soda (crystals)	6 ounces.
Carbonate of soda (crystals)	4 "
Water	32 "

To develop, take No. 1, 1 ounce; No. 2, 1 ounce; water, 2 ounces.

Eastman (for plates).

No. 1.

Sulphite soda (crystals)	6 ounces.
Pyrogallic acid	1 ounce.
Water	32 ounces.

No. 2.

Carbonate of soda (crystals)	4 ounces.
Water	32 "

To develop, take:

No. 1	1 ounce.
No. 2	1 "
Water	3 to 4 ounces.

In warm weather use more water, in cold less.

Seed.

No. 1.

Sulphite of soda (crystals)	4 ounces.
Pyrogallic acid	1 ounce.
Sulphuric acid	10 drops.
Distilled or good well-water	16 ounces.

No. 2.

Sal-soda (crystals)	4 ounces.
Water	16 "

To develop, take:

No. 1	1 ounce.
No. 2	1 "
*Water	8 ounces.

BY HYDROMETER TEST.

No. 1.

Of a clear sulphite of soda solution to test 60° with hydrometer, take	18 ounces.
Pyrogallic acid	1 ounce.
Sulphuric acid	10 drops.

No. 2.

Sal-soda solution, hydrometer test 40°.

To develop, take:

No. 1	1 ounce.
No. 2	1 "
*Water	8 ounces.

Remarks.—More water gives flatness, and less water contrast. Use less water in cold weather.

Seed (for non halation plate).

No. 1.

Sulphite of soda (crystals)	4 ounces.
Pyrogallic acid	1 ounce.
Distilled or good well-water	16 ounces.

No. 2.

Sal-soda	4 ounces.
Water	16 "

To develop, take:

No. 1	½ ounce.
No. 2	½ "
Water	8 ounces.

New York.

No. 1.

Pyro Stock Solution.

Distilled or ice-water	10 ounces or 300 ccm.
Sulphite of soda	4 " " 120 grams.

Dissolve, then add

Pyrogallic acid	1 ounce " 30 "
and water to make up 16 fluid ounces or 480 ccm.	

* For double-coated plates use 18 ounces of water.

No. 2.

Stock Soda Solution.

Distilled or ice-water	10 ounces or 300 ccm.
Sal-soda	4 " " 120 grams.

Dissolve, then add water to make up to 16 fluid ounces or 480 ccm.

No. 3.

Bromide Solution.

Bromide of potassium	$\frac{1}{2}$ ounce or 14 grams.
Water	5 ounces or 150 ccm.

To develop, take:

No. 1, pyro stock solution	1 ounce or 30 ccm.
No. 2, stock soda solution	1 " " 30 "
Water	6 ounces " 180 "

BY HYDROMETER TEST.

No. 1.

Make stock solution of sulphite of soda to test 60° with hydrometer; allow to settle perfectly clear; then take:

Sulphite of soda solution	16 ounces.
Pyro	1 ounce.
Sulphuric acid	10 drops.
or:	
Oxalic acid	10 grains.

No. 2.

Sal-soda solution, hydrometer test 40°.

To develop, take:

No. 1	1 ounce.
No. 2	1 "
Water	8 ounces.

Pyro—Metol.

Hammer's.

No. 1.

Pure water	57 ounces or 1710 ccm.
Sulphite soda (crystals)	2 $\frac{1}{2}$ " " 75 grams.
Metol	1 ounce " 30 "

No. 2.

Pure water	57 ounces or 1710 ccm.
Sulphite soda (crystals)	2 $\frac{1}{2}$ " " 75 grams.
Pyrogallic acid	$\frac{1}{4}$ ounce " 8 "

No. 3.

Pure water	57 ounces or 1710 ccm.
Carbonate of potassium	2 $\frac{1}{2}$ " " 75 grams.

To develop, take:

Pure water	3 ounces or 90 ccm.
Solution No. 1	1 " " 30 "
Solution No. 2	1 " " 30 "
Solution No. 3	1 " " 30 "

This developer may be used repeatedly by adding a little fresh developer as required.

Keep the used developer in separate bottle.

It combines the desirable qualities of metol and pyro, and gives an ideal negative.

Wuestner's.

No. 1.

Pyro and Metol Stock Solution.

Sulphite of soda (crystals)	8 ounces.
Pyrogallic acid	$\frac{1}{2}$ ounce.
Metol, Hauff's	$\frac{1}{2}$ "
Sulphuric acid, C. P.	5 drops.
Water	40 ounces.

No. 2.

Soda Stock Solution.

Sal-soda (crystals)	4 ounces.
Water	40 "

Developer.

Take 2 ounces of No. 1 and 2 ounces of No. 2, and add 8 ounces of water. The beauty of this developer is that, when the pyro ceases to do its work, the metol will continue, and bring out all the details in the shadows.

Another.

No. 1.

Oxalic acid	$\frac{1}{4}$ ounce.
Pyrogallic acid	1 "
Metol Hauff's	$\frac{1}{4}$ "
Bromide of potassium	1 gram or 16 grains.
Water	16 ounces.

No. 2.

Sulphite of soda (crystals)	8 ounces.
Carbonate of soda	4 "
Water	64 "

To develop, take of No. 1, 1 ounce, and No. 2, 5 ounces, and add from 2 to 4 ounces of water.

Metacarb. ol.

Metacarb. ol	25 grains.
Sulphite of soda (crystals)	100 "
Sodium hydrate (caustic soda)	50 "
Water	10 ounces.

Dissolve the metacarb. ol in the water, add the sulphite of soda, and, when this is dissolved, add the sodium hydrate, and filter. With this developer the time of exposure is considerably reduced.

Another formula is:

Metacarb. ol	$\frac{1}{2}$ ounce.
Caustic soda	1 "
Sulphite of soda	2 ounces.
Water	50 "

First dissolve the metacarb and caustic soda in a little of the water (hot), and then add the sulphite of soda and remainder of water.

For use take 1 ounce of this solution and $2\frac{1}{2}$ ounces of water. Use this repeatedly by adding a little fresh solution from time to time.

Another formula, recommended by John Strathmann, is:

A—Metacarb (dissolved in $3\frac{1}{2}$ ounces water) 25 grains.

Sulphite of soda (15° hydrometer) $3\frac{1}{2}$ ounces.

B—Sodium hydrate (20° hydrometer).

For use take:

A 2 ounces.

B 1 ounce.

Water 3 ounces.

For under-timed plates use more of *B*. For over-timed plates use less of *B*, or use old developer.

Hydrochinon. Carbutt.

A.

Warm distilled water 20 ounces or 600 ccm.

Sulphite soda (crystals) 4 " " 120 grams.

Sulphuric acid 1 drachm " 4 "

Hydrochinon 360 grains " $23\frac{1}{2}$ "

Bromide potassium 30 " " 2 "

Water to make up to 32 ounces " 960 ccm.

B.

Carbonate potash 2 ounces or 60 grams.

Carbonate soda (crystals) 2 " " 60 "

Water to make 32 " " 960 ccm.

C.

Accelerator.

Caustic soda 1 ounce or 30 grams.

Water 10 ounces " 300 ccm.

For under-exposure add a few drops of above to developer.

D.

Restrainer.

Bromide of potassium $\frac{1}{2}$ ounce or 14 grams.

Water 5 ounces " 150 ccm.

To develop.

For instantaneous exposures take—*A*, 1 ounce or 30 ccm.; *B*, 1 ounce or 30 ccm.; *water*, 4 ounces or 120 ccm.

For portraits—*A*, 1 ounce or 30 ccm.; *B*, 1 ounce or 30 ccm.; *water*, 5 ounces or 150 ccm.

For landscapes (Sen 20-27)—*A*, 1 ounce or 30 ccm.; *B*, $\frac{1}{2}$ ounce or 15 ccm.; *water*, 3 ounces or 90 ccm.

For landscapes, full exposure (Sen 16-20)—*A*, 1 ounce or 30 ccm.; *B*, $\frac{3}{4}$ ounce or 25 ccm.; *water*, 4 ounces or 120 ccm.

For lantern slide—*A*, 1 ounce or 30 ccm.; *B*, $\frac{3}{4}$ ounce or 25 ccm.; *water*, 4 ounces or 120 ccm.

For lantern slides and full exposures—*A*, 1 ounce or 30 ccm.; *B*, $\frac{3}{4}$ ounce or 25 ccm.; *water*, 4 ounces or 120 ccm.; and 2 to 6 drops restrainer *D* to each ounce of developer. (See below.)

Note.—More of *A* will increase density, more of *B* will increase detail and softness. Temperature of developer should not vary much below 65 degrees nor above 75 degrees. The after-treatment is the same as with any other developer.

For Lantern Plates, Process Plates, and Large Transparencies.

No. 1.

Hydrochinon Solution.

Water (distilled or boiled), warm 10 ounces.

Sulphite of soda (crystals) 1 ounce.

Sulphurous acid $\frac{1}{2}$ "

Mix with 2 ounces cold water and add slowly to the sulphite solution, then add:

Hydrochinon 100 grains.

Bromide potassium 30 "

And water to make the whole measure 15 ounces.

No. 2.

Alkali Solution.

Water 3 ounces.

Carbonate soda (crystals) 1 ounce.

Carbonate potash $\frac{1}{2}$ "

Water to make the whole measure 5 ounces.

To form a developer, mix one part No. 2 with three parts No. 1.

Cramer.

For producing great contrast and intensity, and for developing over-exposed plates.

No. 1.

Distilled or ice water 25 ounces.

Sodium sulphite (crystals) 3 "

Hydrochinon $\frac{1}{2}$ ounce.

Potassium bromide $\frac{1}{4}$ "

Dissolve by warming, and let cool before use.

No. 2.

Water 25 ounces.

Sodium carbonate 6 "

To develop, mix equal parts of Nos. 1 and 2.

Byk's.

Hydrochinon 5 grams.

Potassium carbonate 75 "

Sodium carbonate 40 "

Water to make 1000 "

Mix in reverse order. Use full strength.

Eikonogen.

No. 1.

Sodium sulphite (crystals) 2 ounces.

Eikonogen (finely powdered) 1 ounce.

Water 40 ounces.

No. 2.

Potassium carbonate 1 ounce.

Water 10 ounces.

To develop, take 3 ounces of No. 1 and 1 ounce of No. 2. As a restrainer, use a few drops of a 10 per cent. solution of potassium bromide.

For Climax Plates.

No. 1.	
Eikonogen	1 ounce.
Sulphite soda	1½ ounces.
Water	45 "

No. 2.	
Carbonate potash	1½ ounces.
Water	15 "

To develop, take three ounces No. 1, one ounce No. 2, half old and half new developer: when about half done, place it in new developer, three to one, as above, and carry it well along.

Can be used over and over by adding a little fresh developer each time. Any amount of density may be obtained with this developer by varying the proportions and a normal exposure.

Eastman.

No. 1.	
Sulphite soda (crystals)	3 ounces.
Eikonogen	1 ounce.
Water	60 ounces.

No. 2.	
Carbonate of potash	3 ounces.
Water	30 "

To develop, take:

No. 1	2 ounces.
No. 2	1 ounce.
Water	2 ounces.

If you desire to have the developed negative of a warm tone, add 100 grams pyrogallic acid to No. 1 stock solution.

American.

No. 1.	
Sulphite of soda (hydrometer test 30°)	40 ounces.
Eikonogen	1 ounce.

No. 2.

Potassium carbonate to test 10°.

To develop, use equal parts. For more contrast use more of No. 1. For more detail use more of No. 2.

Wuestner's (for portraits and landscapes.)

No. 1.	
Sulphite of soda (crystals)	3½ ounces or 115 grams.
Oxalic acid	1 drachm " 4 "
Eikonogen	2½ ounces " 75 "
Yellow prussiate of potash	½ ounce " 15 "
Distilled water	80 ounces " 2400 ccm.

Dissolve the eikonogen in hot water.

No. 2.

Carbonate of potash	2 ounces or 60 grams.
Distilled water	20 " " 600 ccm.

Developer.

Take 4 ounces of No. 1 and ½ ounce of No. 2.

For aristo paper printing, to obtain thin negatives, dilute the developer more. For more intensity add to No. 1 10 grams of hydrochinon.

New York.

No. 1.

Distilled or ice-water	60 ounces.
Eikonogen	1 ounce.
Sulphite soda (crystals)	3 ounces.
Sulphurous acid	½ ounce.

Dissolve the eikonogen in 30 ounces of the water, warmed, dissolve the sulphite in 20 ounces, and dilute the acid in 10 ounces. Pour the sulphite solution into the eikonogen, then add the acid to the whole. Never pour the eikonogen into the sulphite solution.

No. 2.

Carbonate soda (granular)	4 ounces.
Water	40 "

To develop, take:

No. 1	4 ounces.
No. 2	4 "
Water	5 "

Add 10 drops of a 10 per cent. solution of bromide ammonium. In hot weather increase the water to 10 ounces.

This developer can be used repeatedly by occasionally adding more of solutions No. 1 and No. 2.

To obtain thin negatives, full of detail, such as are required for printing on aristo paper, use the developer more diluted.

After development wash thoroughly under tap, and immerse in fixing bath.

Carbutt's.

A.

Distilled water	20 ounces or 600 ccm.
Sulphite of soda (crystals)	4 " " 120 grams.
Eikonogen	330 grains " 22 "
Hydrochinon	160 " " 10½ "
Water to make up to	32 ounces " 960 ccm.

B.

Distilled water	20 ounces or 600 ccm.
Carbonate of potash	2 " " 60 grams.
Carbonate of soda (crystals)	2 " " 60 "
Water to make up to	32 " " 960 ccm.

To develop, see Carbutt's hydrochinon developer.

Seed.

No. 1.

Sodium sulphite (crystals)	4 ounces.
Eikonogen	240 grains.
Hydrochinon	60 "
Distilled or pure well-water	32 ounces.

No. 2.

Carbonate of potash	4 ounces.
Water	32 "

To develop, take :

No. 1	2 ounces.
No. 2	1 ounce.
* Water	1 "

More water gives less contrast and density.

BY HYDROMETER TEST.

No. 1.

Sodium sulphite solution to test 30°	34 ounces.
Eikonogen	240 grains.
Hydrochinon	60 "

Carbonate of potash solution to test 50°.

To develop, take :

No. 1	2 ounces.
No. 2	1 ounce.
Water	1 "

For Lantern Slides and Transparencies.

No. 1.

Distilled water	20 ounces.
Sodium sulphite (crystals)	1 ounce.
Citric acid	20 grains.
Eikonogen	120 "
Hydrochinon	60 "

No. 2.

Distilled water	20 ounces.
Caustic potash	120 grains.
Potassium bromide	120 "

To develop, take two parts No. 1 and one of No. 2.

Ferrous Oxalate.

Neutral oxalate of potash, saturated solution. Protosulphate of iron, saturated solution, 10 drops sulphuric acid.

To develop.

Oxalate solution	10 ounces.
Iron solution	2 "
Old (used) developer	2 "

* For double-coated plates use 5 ounces of water.

For Transparencies and Opals.

Carbutt's.

A.

Oxalate of potash	8 ounces.
Citric acid	60 grains.
Citrate of ammonia solution	2 ounces.
Water	30 "

B.

Sulphate of iron	4 ounces.
Sulphuric acid	16 drops.
Water	32 ounces.

C.

Citrate of Ammonia Solution.

Dissolve 1 ounce citric acid in 5 ounces distilled water, add liquor ammonia until a slip of litmus paper just loses the red color. then add water to make the whole 8 ounces.

Developer.

Add 1 ounce of B to 2 of A, and ½ ounce of water, and 3 to 6 drops of 10 per cent. solution bromide of potassium.

To develop, first rinse developing dish with water, lay film or plate down, and flow with sufficient developer to well cover. Careful attention must be given to its action; and, when detail is just showing in the face, or half-tone lights in a view, pour off developer, and well wash the film before fixing.

Metol.

Cramer.

Thoroughly dissolve

Metol	1 ounce.
Water	60 ounces.
Add sulphite of soda (crystals)	6 "
Bicarbonate of soda	3 "

To prepare with hydrometer, mix

Sulphite of soda solution (testing 75°)	30 ounces.
Bicarbonate of soda solution (testing 50°)	30 "
Metol (dissolved in 12 ounces of water)	1 ounce.

This developer has excellent keeping qualities, works very uniformly, and can be used repeatedly, without difference in the results. The bicarbonate of soda being a very mild alkali, it is not liable to injure the film or fog the plate.

Seed.

No. 1.

Metol	100 grains.
Sodium sulphite (crystals)	1 ounce.
Water	8 ounces.

No. 2.

Potassium carbonate	1 ounce.
Water	10 ounces.

To develop, take 1 ounce of No. 1, 1 ounce of No. 2, and 5 ounces of water.

Hammer.

No. 1.

Pure hot water	80 ounces or 2400 ccm.
Metol	1 ounce " 30 grams.
Hydrochinon	$\frac{1}{8}$ " " 4 "
Sulphite soda (crystals)	6 ounces " 180 "

No. 2.

Pure water	80 ounces or 2400 ccm.
Carbonate soda (crystals)	5 " " 150 grams.

To develop, take:

Pure water	2 ounces or 60 ccm.
Solution No. 1	1 ounce " 30 "
Solution No. 2	1 " " 30 "

We have frequent requests for a formula for small quantity of developer hence the following:—

No. 1.

Pure water	8 ounces or 240 ccm.
Sulphite soda (crystals)	150 grains " 10 grams.
Eikonogen	60 " " 4 "
Hydrochinon	8 " " $\frac{1}{2}$ gram.

No. 2.

Pure water	8 ounces or 240 ccm.
Carbonate potassium, <i>dry</i>	150 grains " 10 grams.

To develop, take:

Solution No. 1	2 ounces or 60 ccm.
Solution No. 2	1 ounce " 30 "

Can be used repeatedly until exhausted.

New York.

12 ounces sulphite soda solution to test 25° by hydrometer.
12 ounces carbonate soda solution to test 15° by hydrometer.
50 grains metol.
60 grains hydrochinon.

To develop, take 1 ounce of solution to 2 ounces of water. For instantaneous or under-timed exposures, use equal quantities of the solution and water.

Wuestner's (for Snap-shot Exposures).

Make a sulphite of soda (crystals) solution . . . hydrometer test, 30°.
And a carbonate of soda solution hydrometer test, 20°.
Dissolve 2 grams (30 grains) of metol (Hauff's) in 2 ounces of water.
Dissolve 2 grams (30 grains) of hydrochinon in 2 ounces of water.

Developer.

Take 10 ounces of the sulphite of soda solution and 10 ounces of the carbonate of soda solution; add the metol and hydrochinon, and your developer is ready.

This developer can be used repeatedly.

Metol and Hydrochinon.

Climax.

Metol	70 grains.
Hydrochinon	50 "
Water	80 ounces.
Sulphite soda (crystals)	4 "
Sal-soda	$2\frac{1}{2}$ "

Dissolve sulphite *first* before adding other chemicals.

Note.— This is a very energetic developer, and is strongly recommended for under-exposed plates. It can be used repeatedly.

Cramer.

Thoroughly dissolve

Metol	$\frac{1}{4}$ ounce.
Hydrochinon	$\frac{1}{4}$ "
In water	80 ounces.

Then add

Sulphite of soda (crystals)	4 "
Carbonate of soda (crystals)	$2\frac{1}{2}$ "

To prepare this with hydrometer, mix

20 ounces sulphite of soda solution, testing 60°

20 ounces carbonate of soda solution, " 30°

$\frac{1}{4}$ ounce metol } dissolved in 40 ounces water.
 $\frac{1}{4}$ ounce hydrochinon, }

For summer use, dilute the developer with an equal quantity of water, also for large plates, so that the development does not proceed too rapidly and can be properly controlled.

If negatives of less contrast are desired, use less hydrochinon and more metol.

Seed.

No. 1.

Metol	30 grains.
Hydrochinon	30 "
Sodium sulphite (crystals)	240 "
Water	16 ounces.

No. 2.

Potassium carbonate	120 grains.
Water	10 ounces.

To develop, take 1 ounce No. 1, 1 ounce of No. 2, and 1 ounce of water.

HYDROMETER TEST.

No. 1.

Sodium sulphite solution, test 10°, take	16 ounces.
Metol	30 grains.
Hydrochinon	" "

No. 2.

Potassium Carbonate Solution, Test 10°.

To develop, take:

No. 1	1 ounce.
No. 2	1 "
Water	1 "

By taking equal parts of Nos. 1 and 2 without water, and adding 5 to 10 drops to the ounce of a 10 per cent. potassium bromide solution, this developer can be used for black tones on lantern slides and transparency plates.

For Velox Paper.

Printing.—Open package of paper by gaslight or very subdued daylight.

An average negative requires, ordinarily, an exposure of from one to eight seconds to diffused daylight a few feet away from northern window, electric arc-light requires about the same exposure. Welsbach gaslight needs several seconds more than an arc-light, an ordinary gas-jet, or a kerosene lamp, at a distance of three or four inches from negative, will yield a print in one or two minutes. Very dense negatives require much more time, while very weak ones require less. All "special velox" papers require less exposure than ordinary velox. Use a strip of paper to ascertain the proper length of exposure before proceeding with regular printing, and keep your printing-frame always at the same distance from the light.

Developing.—After exposure develop with any of the developers given below, at a safe distance of a few feet from an ordinary gas or lamp light. Ruby light is absolutely needless.

Essential Condition of Success.—Use strong and fresh developer with just enough bromide to insure pure whites. More bromide gives greenish blacks. Before developing, dip the sheet of paper for one or two seconds in a pail of water.

With any of the indicated developers development is very quick, except with "special velox," and takes only a few seconds. In fact, you do not need a tray, as the exposed print may be put on a glass plate, and the developer spread abundantly and uniformly over its surface by means of a brush or a tuft of cotton. The image will appear suddenly; somewhat more slowly for all "special velox" papers. As soon as it is strong enough, dip quickly in water and throw into the following:

Hypo Acid Fixing Bath.

Hypo	16 ounces.
Water	64 "

Then add the following hardening solution:

Sodium sulphite (crystals)	$\frac{1}{2}$ ounce.
Acetic acid No. 8 (or about $4\frac{1}{2}^{\circ}$ B)	3 ounces.
Powdered alum	$\frac{1}{2}$ ounce.
Water	5 ounces.

This mixture keeps perfectly clear, and can be made up any time in advance. It can be used as long as it is strong enough.

Keep your prints moving in the fixing bath during the first few seconds, so as to insure uniform and thorough fixing, thus preventing stains and yellow whites.

Fix ten or fifteen minutes, then wash from twenty minutes to one hour in running water. Longer fixing in summer may turn the prints brown. Imperfect washing will produce fading prints.

Developers.

Any of the following formulæ may be used with success. Be sure, however, to have your chemicals pure, especially your sulphite, and not to let your developers become spoiled by oxidation. Therefore, keep it in small, well-stoppered bottles filled to the neck. Rubber stoppers are recommended. Too weak a developer or one that is oxidized or contains too much bromide will give greenish or brownish blacks.

It is almost invariably necessary, in order to prevent foggy or stained whites in prints, to add a small quantity of a 10 per cent. bromide of potassium solution

to the developer. This quantity will vary according to purity of chemicals and water. "Special velox" can stand more bromide and further dilution than ordinary velox.

Metol Quinol.

Metol	7 grains.
Sodium sulphite (crystals pure)	$\frac{1}{2}$ ounce.
Hydrochinon	30 grains.
Sodium carbonate, desiccated*	200 "
10 per cent. bromide of potassium solution, about	10 drops.
Water	10 ounces.

Amidol.

Sodium sulphite (crystals pure)	200 grains.
Amidol	20 "
10 per cent. bromide of potassium solution, about	5 drops.
Water	4 ounces.

Metol.

Metol	25 grains.
Sodium sulphite (crystals pure)	$\frac{1}{2}$ ounce.
Sodium carbonate, desiccated*	120 grains.
10 per cent. bromide of potassium solution, about	20 drops.
Water	10 ounces.

Causes of Non-Success on Velox Paper.

Impure Whites.—Lack of bromide in developer. Add a few more drops of a 10 per cent. bromide of potassium solution or a somewhat larger amount of kitchen salt. May be caused also by trying to force the development of under-timed prints or by not moving prints in hypo bath. Possibly light struck paper.

Greenish or Brownish Blacks.—Too weak or too old developer; too much bromide in the developer; oxidized developer; over-exposure. Take a more concentrated developer or use less bromide. Strong developer can stand more bromide than a weak one without giving greenish-blacks.

Contrasty Prints.—Negative too harsh, make softer negatives. Increase slightly the exposure. Use "special velox," which works softer.

Prints too Weak.—Under-exposure or developer too weak.

Prints too Black.—Over-exposure. See also "Impure Whites."

Yellow Stain Sometimes Irregular in Shape.—Developer not spread uniformly over the prints or too long a time elapsed between developing and fixing. You should immerse immediately and completely in the acid hypo after developing, and keep your prints moving during the first few seconds after immersion. Stain all over the film is the result of trying to force the development of under-timed prints; or too weak a developer; or incomplete fixing; or insufficient washing after fixing; or wash-water containing iron. In case of incomplete fixing or incomplete washing the prints will have a sweet taste. Yellow whites may be avoided by rinsing prints before fixing.

Purple or Brownish Stains.—Incomplete fixing. Leave longer in the hypo; use stronger hypo; keep prints moving in hypo. Try rinsing prints before fixing.

Blisters.—Prints have been creased or broken while washing. Do not allow water to run directly from the faucet on to the prints. Add some alum to your hypo so as to harden the film. Too acid or too strong hypo may cause this.

*If you use crystallized carbonate of sodium, take double this quantity.

Discoloration around the Edges.—If the centre of the print is clear, it indicates that the paper has been kept in a place where it has been submitted to chemical emanations (ammonia vapors, light-gas, sewer-gas, etc.). May be caused also by not spreading the developer evenly and abundantly over the prints. May be removed by using hypo and ferricyanide.

Round White Spots.—Air-bubbles on the surface of the paper, which may be removed by means of the finger while the print is developing.

Picture Developing Irregularly and appearing to be covered with irregular greasy streaks, as if the paper was not coated uniformly or had been touched with greasy fingers. This defect occurs while developing, especially with glossy and special velox, and is the result of the use of impure sulphite which contains sulphate. Too diluted a developer may cause this same defect. Soaking the paper in water before developing will avoid it.

Picture is Good, but Surface is covered with Stains running in One Direction, which look like Pencil-marks.—This defect occurs mostly with glossy velox, and is the result of pressure or friction. It can be avoided to a certain extent by increasing the amount of bromide in the developer. These surface stains can easily be removed from the dry print by rubbing the same with a tuft of cotton dipped in wood alcohol. Another way of getting rid of surface stains on glossy velox is to put the prints for a few seconds in a hypo solution of about 30° hydrometer test (10 per cent. or specific gravity 1050), to which a few drops of a concentrated solution of red prussiate of potash (ferricyanide of potassium) have been added. This bath only works when freshly prepared. The more prussiate is added, the quicker the bath will act. If prints are left in it too long, the image will turn yellow in the half-tones. There is, of course, a very slight reduction in the strength of the prints. After this the prints should be thrown at once into abundant wash-water and washed as usual. The treatment with hypo and ferricyanide may be employed, either when the prints leave the fixing bath or after they are dry. This is a much easier method than cleaning them with alcohol. The same method may be used for reducing over-timed prints or those of which the whites are slightly "fogged."

Same Negative and Same Developer may give Different Results on Glossy Velox and on Matt Velox.—Some coatings may require a stronger developer, more bromide in the developer, and somewhat longer exposure than matt velox.

Directions for using Eastman's Royal Bromide Paper.

Concentrated Solution.

The concentrated stock solution is prepared by dissolving in succession in

Water	12 ounces.
Sodium sulphite (crystals)	3 "
Amidol	$\frac{1}{2}$ ounce.

Enough of this stock solution should be prepared at one time for one day's use.

To develop.

Take in a suitable tray :

Concentrated stock solution	1 $\frac{1}{2}$ ounces.
10 per cent. solution, bromide of potassium	8 drops.
Water	6 ounces.

Use cold. After exposure soak the paper in water until limp, and brush lightly over the surface while wet with a tuft of cotton: then immerse in the developer.

The image should appear slowly, and should develop up strong, clear, and brilliant. When the shadows are sufficiently black, pour off the developer, and rinse the print thoroughly with pure water. If the print has been over-exposed, a small quantity of a solution of bromide of potassium should be used as a restrainer.

Note.—The above developer can be used over by the addition from time to time of some fresh developer. If, however, the restrainer solution has been added to it, the developer should not be used again except for prints that are known to have been over-exposed.

Immerse print for ten minutes in the

Fixing Bath.

Hyposulphite soda	3 ounces.
Water	16 ounces.

After fixing, wash thoroughly two hours and hang up to dry.

Important Details.

With a glass tray 7 ounces of developer are sufficient for a 25 x 30 print.

Clean Dishes — Clean Hands.—The faintest trace of hyposulphite of soda or of pyrogallic acid is fatal to good results with bromide paper, and the operator cannot be too careful to avoid any contamination.

Do not use concentrated solution more than twenty-four hours old.

Fresh hypo solution is required for fixing each batch of prints.

The washing must be thorough after fixing.

Mealy prints are caused by over-exposure.

Other developers (except pyrogallic acid and iron) may be used to develop Eastman's Royal Bromide Papers, formulas for the use of which accompany the chemicals.

We recommend amidol on account of its producing the most uniformly satisfactory results.

Contact Printing.

Daylight, gas, lamp, or candle light may be used.

The exposure varies with the intensity of the negative and the quality and intensity of the light, but may be approximately stated to be, using as thin a glass negative or film as will make a good print, one second by diffused daylight or ten seconds at a distance of one foot from a No. 2 kerosene burner.

Owing to the broad effects and the rough texture of the paper, we do not recommend Royal Bromide for prints smaller than 8 x 10.

Enlarging.

If one has a weak negative to enlarge by daylight, a strong print may be obtained from it by varnishing the back with ordinary negative varnish, slightly tinted with a yellow aniline dye. Where many such negatives have to be treated, separate glasses tinted to various shades of yellow may be employed, one of these glasses being put directly behind the negative, between it and the source of light. Only a very slight yellow tint is required to increase the contrast in the resulting print to a marked degree.

A glass tinted with blue varnish will reduce contrast.

Mounting.

On Card.—Royal Bromide prints should be mounted wet. Lay the wet print face down on table covered with oil or rubber-cloth or sheet of glass, and squeegee off all the surplus water; then brush over the back with thin starch paste; lay the print on the mount; then cover the print with a clean piece of cotton cloth, and rub into contact with a soft cloth.

Cloth Mounting.—Enlargements are usually mounted on cloth-covered strainers as follows: Take a frame, such as artists use for stretching canvas, and cover it with common white cloth; put the cloth on dry, stretching it tight, and tacking along the edges. Lay the wet print face down on table covered with oil-cloth or rubber-cloth or sheet of glass, and squeegee off the surplus water; then brush over the back with thin starch paste, give the cloth on the strainer a coat of paste, lay the print on the strainer; then turn the strainer and print over, and lay face down on table or glass, and rub in contact with soft cloth; then turn the strainer over and cover with a clean piece of cotton cloth and rub in contact with hand or soft rag; rub under the frame with a paper or palette knife, and remove what paste may have come through the back of cloth under the frame, or the inside edges of strainer will show through. When dry, the print will be stretched smooth and tight.

Straightening Unmounted Prints.—After drying, prints may be straightened by the scraping action of a sharp-edged ruler applied to the back, the corner behind the ruler being lifted as the ruler is passed along.

FOR SEPIA TONES ON EASTMAN'S ROYAL BROMIDE PAPER.

Hypo Toning Bath.

Directions.

By using the following formula rich brown and sepia tones can be readily obtained. The tones produced are believed to be permanent and not subject to the bronzing in the shadows which occur in bromides toned with uranium. For the best results the prints should be *slightly* over-timed and have short development.

After prints are fixed and washed, they may be transferred direct to the toning solutions. It is, however, preferable that they should be dried first and then toned, as there is less liability to frill and blister.

Formula.

Hyposulphite of soda	20 ounces.
Ground alum	4 "
Hot water, not over 150° F.	1 gallon.

Dissolve the hypo in the water first, then add the alum slowly; when all is dissolved, the solution should be milk-white. This solution should not be filtered, and must be mixed twelve hours before use.

First Hardening Solution.—Previous to toning, prints should be immersed for five minutes in a solution of above formula, which is to be used at a normal temperature of about 65° or 70° F.

Brush lightly over the surface while in first hardening solution with a tuft of cotton before placing in hot toning bath.

To tone, take a suitable quantity of above mixture, heat to 130° F., remove prints directly from cold solution to warm solution, where they should remain until the desired tone is obtained. Transfer to

Second Hardening Solution.—

Alum	2 ounces.
Water	70 "

Finally, wash thoroughly.

Details.

The object of putting the print in a cold toning bath first is to harden the gelatine before putting it in a hot bath. Plain alum solution will not answer, because transferring the prints from it will overcharge the bath with alum.

Several prints may be toned in the hot bath together, or one immediately after the other, providing the bath is kept constantly hot.

The final alum bath is used to prevent blisters. It need not be used unless they occur.

The toning takes from ten minutes to half an hour in warm bath.

Amidol.

Sodium sulphite (crystals)	120 grains.
Amidol	20 "
Water	10 ounces.

This developer should always be used fresh.

Or:

Sulphite of soda (crystals)	800 grains or 52 grams.
Amidol	80 " " 5 "
Water	8 ounces " 240 ccm.

To develop, take four parts of water and one part of amidol solution.

Bromo-hydrochinon Developer.

Cramer.

For producing great contrast and intensity, for developing over-exposed plates.

No. 1.

Sulphite of soda (crystals)	3 ounces.
Hydrochinon	$\frac{1}{2}$ ounce.
Bromide of potassium	$\frac{1}{4}$ "
Distilled or ice-water	25 ounces.

Dissolve by warming, and let cool before use.

No. 2.

Carbonate of soda (crystals)	6 ounces.
Water	25 "

Mix 1 and 2 equal parts, for use.

Rodinal.

Hammer.

One part rodinal to thirty parts pure water. Use repeatedly, adding fresh as required.

Glycin-Pyro.

Wuestner's.

For Transparencies, Process Plates, and Lantern Slides.

After having given the plate the same time of exposure as you would for iron oxalate or hydrochinon developer, place it in the following solution for half a minute:—

Glycin	2 grams.
Carbonate potassium	16 "
Bromide of potassium (5 grains)	$\frac{1}{2}$ gram.
Water	17 ounces.

Use in quantity to suit size of plate.

For a 5 x 8 plate use 4 ounces of the above solution, and after $\frac{1}{2}$ minute, before the image has made any appearance, add $1\frac{1}{2}$ to 2 ounces of the following solution:

Sulphite of soda (crystals)	75 ounces.
Pyrogallic acid	$\frac{1}{2}$ ounce.
Sulphuric acid, C. P.	5 drops.
Water	12 ounces.

And the image will appear immediately and develop quickly in beautiful roundness and extreme clearness.

It is not advisable to mix both solutions at once, as the result will not be as good as by the foregoing method, as you can control the development at will by the greater or lesser addition of pyro solution, which hastens or retards the development according to quantity used.

After development rinse the positive well and fix in an acid fixing bath. With this developer the toning of the positive is unnecessary.

The color of the picture will be the same as that of a plate which has gone through a gold bath toning solution.

With non-halation plates the development should be carried on until the high-lights become black: this is done so that the developer works through both films.

Glycin.

Glycin	5 parts.
Sodium sulphite	15 "
Potassium carbonate	25 "
Water	90 "

For use, dilute with 3 or 4 volumes of water.

FIXING BATHS FOR PLATES.

Sodium hyposulphite	2 ounces.
Water	10 "

Or:

Sodium hyposulphite	2 ounces.
Acid sulphite of soda	$\frac{1}{2}$ ounce.
Water	10 ounces.

This bath is somewhat reducing in its action, and will be found useful in clearing muddy or stained negatives.

Climax.

Hypo	$2\frac{1}{2}$ pounds.
Alum	2 ounces.
Water	4 quarts.

Leave the negative a few minutes longer in the bath than is required for fixing. This is important, as the permanency of the negative depends upon it. Don't use a flat tray to fix in,—it causes spots and dirt: use a grooved box.

Carbutt's.

Sulphuric acid	1 drachm or	4 ccm.
Hyposulphite of soda	16 ounces	" 480 grams.
Sulphite of soda	2 "	" 60 "
Chrome alum	1 ounce	" 30 "
Warm water	64 ounces	" 1920 ccm.

Dissolve the hyposulphite of soda in 48 ounces (1440 ccm.) of water, the sulphite of soda in 6 ounces (180 ccm.) of water, mix the sulphuric acid with 2 ounces (66 ccm.) of water, and pour slowly into the sulphite of soda solution, and add to the hyposulphite: then dissolve the chrome alum in 8 ounces (240 ccm.) of water and add to the bulk of solution, and the bath is ready. This fixing bath will not discolor until after long use, and both clears up the shadows of the negative and hardens the film at the same time.

After negative is cleared of all appearance of silver bromide, wash in running water for not less than half an hour to free from any trace of hypo solution. Swab the surface with wad of wet cotton, rinse, and place in rack to dry spontaneously.

American.

Citric acid	160 grains.
Hyposulphite of soda	1 pound.
Water	32 ounces.

First dissolve the citric acid, add the hypo and allow to settle.

Cramer.

The negatives may be fixed in a plain hypo bath, 1 part hyposulphite of soda to 4 parts of water, but the following bath is especially recommended.

Prepare two solutions.

No. 1.	
Hyposulphite of soda	48 ounces.
Water	96 " (3 quarts).

No. 2.	
Water	32 ounces.
Add, gradually, sulphuric acid	$\frac{1}{2}$ ounce.
Sulphite of sodium crystals	4 ounces.
Chrome alum	2 "

After the ingredients are dissolved, pour No. 2 solution into No. 1.

During the cold season, one-half the quantity of No. 2 is sufficient.

This bath combines the following advantages: it remains clear after frequent use, does not discolor the negatives, forms no precipitate upon them, and hardens the gelatine to such a degree that the negatives can be washed in warm water, provided they have been left in the bath a sufficient time.

The plate should be allowed to remain in the bath five to ten minutes after the bromide of silver appears to have been dissolved. The permanency of the negative and freedom from stain, as well as the hardening of the film, depend upon this.

Seed.

No. 1.	
Sodium hyposulphite	2 pounds.
Sodium sulphite (crystals)	4 ounces.
Water	96 "

No. 2.

Chrome alum	2 ounces.
Sulphuric acid	$\frac{1}{2}$ ounce.
Water	32 ounces.

Pour No. 2 into No. 1 while stirring rapidly.

Wuestner.

Hypo	25 ounces.
Saturated chrome alum solution	5 "
Water	100 "

This bath is good until the greenish-blue color turns brown, when a fresh bath must be made.

Acid Chrome Alum Fixing Bath.

This may be used in hot weather, and is to be mixed in the order given, then it will always work clear.

Sulphuric acid	3 drachms.
Sulphite of soda	4 ounces.
Water (about)	100 "

When this is about half dissolved, add hyposulphite of soda, 2 pounds; after the hypo is dissolved, add from 1 to 2 ounces chrome alum dissolved in 20 ounces water; then add enough water to make 160 ounces.

Another formula for preparing a highly concentrated "acid chrome alum sulphite solution" can be made up in any quantity, and added to the fixing solution — one ounce to each gallon of solution as needed — to harden the film in hot weather. Make a solution of sulphite soda in water testing 60° by the hydrometer; to each 32 ounces of this add 1 pound chrome alum; when this is dissolved, add *slowly* 2 ounces sulphuric acid.

INTENSIFICATION.

Climax.

After fixing and washing thoroughly, immerse in a tray containing the following: 1 ounce each of bichloride of mercury and potassium bromide, dissolved in 32 ounces of water. Keep in motion until the film is evenly whitened, then rinse and apply a solution of sulphite of soda, 1 ounce, to water, 10 ounces.

For very slight intensity use above solutions, diluted to suit the case.

Cramer.

Prepare a saturated solution of bichloride of mercury in water, and pour of this a sufficient quantity gradually into a solution of

Iodide of potassium	1 $\frac{1}{4}$ ounces,
Water	6 ounces,

until the point is reached when the forming red precipitate will no longer dissolve by shaking, but be careful not to add more mercury than just enough to make the solution very *slightly* turbid. Now add

Hyposulphite of soda 1 ounce,
dissolve, and add water to make 20 ounces solution.

For use this should be diluted with about three-parts of water. If the plate has not been thoroughly fixed, the intensifying solution will produce yellow stains. Be careful not to overdue the intensifying. Should it have gone too far, the negative can be reduced by placing it in the fixing bath for a short time.

Hammer.

No. 1.

Bichloride of mercury	60 grains.
Bromide of potassium	60 " "
Water	6 $\frac{1}{2}$ ounces.

No. 2.

Sulphite of sodium	$\frac{1}{2}$ ounce.
Water	4 ounces.

Place the negative in solution in No. 1 until bleached, then rinse and place in solution No. 2 until entirely cleared, after which the plate must be well washed. This operation may be repeated if there is not sufficient intensity gained by first treatment.

Carbutt.

With correct exposure and development, intensification need never be resorted to. The following formula is, however, very effective, and the most permanent of all methods:

No. 1.

Bichloride mercury	240 grains or 16 grams.
Chloride ammonia	240 " " 16 "
Distilled water	20 ounces " 600 ccm.

No. 2.

Chloride ammonia	240 grains or 16 grams.
Water	20 ounces " 600 ccm.

Let the plate to be intensified wash for at least half an hour, then lay in a 5 per cent. solution of alum for ten minutes, and again wash thoroughly. This is to insure the perfect elimination of the hypo. The least trace of yellowness after intensifying shows that the washing was not sufficient. Then immerse negative in above No. 1 solution, observing that, the longer it remains in the solution, the greater will be the final density. Wash well, and flow over for a few seconds the solution of ammonium chloride No. 2. Wash after this application, and immerse in dilute ammonia water (1 drachm strong ammonia in 8 ounces of water) until the white image is darkened through to back of plate; or, in place of the dilute ammonia, a 10 per cent. solution sulphite of soda. When darkened through, rinse well and set up to dry.

REDUCTION.

Dissolve 1 part red prussiate of potash in 15 parts of water. Wrap the bottle in yellow wrapping-paper, as the solution is affected by light and will not keep long. Immerse the negative in a hypo solution — 1 part hypo to 15 parts of water — to which has been added a little of the above immediately before use. When reduced sufficiently, wash thoroughly.

CLIMAX REDUCER.

To reduce a negative, it is immersed in a solution made by mixing equal parts of the following:

No. 1.

Red prussiate of potash	1 ounce.
Water	20 ounces.

No. 2.

Hyposulphite of soda	1 ounce.
Water	20 ounces.

Several negatives may be reduced with the same solution. If very little reduction is needed, reduce the solution by adding water. Not necessary to wash before reducing.

Cyanide Reducing Solution.

Cyanide of potassium	20 grains.
Iodide of potassium	10 "
Bichloride of mercury	10 "
Water	10 ounces.

Reduction takes place slowly and is easy to control. After reducing, the negative should be washed thoroughly.

Another Method.

No. 1.

Hyposulphite of soda (crystals)	77 ² grains.
Water	8 ounces.

No. 2.

Ferricyanide of potassium	76 grains.
Water	6 drachms.

To reduce, use No. 1, 5 ounces; No. 2, 2 drachms.

Another Method.

Potassium ferricyanide	1 ounce or 30 grams.
Distilled or melted ice-water	16 fluid ounces or 500 cc.

Keep the above solution in the dark, when not in use. To reduce a negative, immerse it in hypo solution of a strength of about one ounce of hypo to a pint of water, to which a small quantity of the reducing solution has been added. To reduce locally, immerse the plate for a few minutes in water, and apply the mixed solution with a camel's-hair brush to the part required. Silver stains may also be removed after wetting the plate by brushing them over with the solution. At the end, wash thoroughly. The ferricyanide solution must be added to the hypo at the time of using, as the mixed solutions do not keep.

Wuestner.

Saturated solution of potassium ferricyanide	1 part.
Sodium hyposulphite solution (1 : 5)	10 parts.

After reduction, wash the negative thoroughly.

DEVELOPMENT POINTERS.

A developer containing a surplus of alkali effects more detail in the shadows and lessens the intensity of the high lights, which causes more softness in the negative. Consequently, such a developer suits well for under-exposed plates, which explains why for under-exposures a preliminary bath in a soda solution or ammonia solution is used to advantage.

A large number of developing substances, such as pyro, eikonogen, metol, hydrochinon, and glycin, quickly intensify the high-lights, and hasten the devel-

opment, so that the shadows remain far behind. Therefore, a modification by little over-exposure, dull lighting, or soft-working plates, is of good service.

The developer diluted with water slows the process of development, gives the shadows more of a chance to work through before the high lights have gained their strength, prevents contrast, and therefore is recommended for contrasty plates or under-exposure.

The old or used developer acts the same as bromide, checks the development, and clears, and is used when plates are greatly over-exposed or a general fog is apparent.

The room in which plates are handled and developed must be a perfectly dark room, save for the light from a small ruby or orange-colored window (or one containing a combination of these colors), by which the progress of development can be watched. If possible, have an abundance of pure running water, and provide good ventilation. You will have better negatives and better health by so doing.

The window in your dark room which illuminates the sensitive plate during the process of development must be as non-actinic as possible. There is no such thing as a perfectly safe light. Any light to be of sufficient illuminating power to be of practical use will affect a very sensitive plate if given time enough, it is therefore necessary to use great care in developing. The best and safest light for your dark-room window is a combination of ruby glass and orange paper, commonly called post-office paper. This is easier on the eyes than ruby glass alone, and by its use the quality of the negative may be more easily determined. Use a lamp or gas-jet outside to illuminate the window, as it is safer and more uniform than daylight.

A soft camel's-hair brush may be used to remove the dust from plates before placing them in the holder or dark slide. If the brushing is done hurriedly, the film will be instantly electrified and attract to itself more dust than you remove.

When plates are exposed and set away for future development, be sure to set them *face to face*, as they were in the original boxes. If the face or film is placed against the back, you will probably have finger-marks on the film, caused by the fingers coming in contact with the backs of the plates while placing them in the holder.

It is advisable to use a fresh solution of hyposulphite of sodium each day during the hot weather. The fresh solution hardens the film, and alum will not be necessary.

Thorough fixing and thorough washing, followed by quick drying, will insure permanency and fine printing quality in the negative.

During the hot season the developer must be used more diluted and cold (by placing in ice-cold water); while *during the cold season* it should be stronger and moderately warm, about 70° F.

Developer which is too strongly alkaline or too warm produces stain and fog.

As soon as *over-exposure* is noticed in developing, check it immediately by plentiful washing, and finish with the regular developer, to which has been added bromide or old developer.

An *under-timed plate* should be treated with a fresh, diluted developer, and, if sufficient detail does not appear, take the plate from the developer and, without rinsing, place it in a tray containing water, to which a little of the alkaline solution (sulphite and carbonate of soda) has been added, and leave it there as long as it increases in detail. If it is not then strong enough, the development may be continued in fresh developer.

To prevent sand or rust from striking the negatives while washing, tie a piece of cotton flannel over the faucet.

Negatives exposed to white light before the bromide of silver is thoroughly dissolved in the fixing solution will be foggy, and the printing quality will be injured.

A solution of bromide of potassium (1 ounce of bromide to 10 ounces of water) should be in every developing-room. When plates are a little over-exposed, a few drops of this solution added to the developer will restrain its action, and may thus produce a good negative from what would otherwise be a worthless plate.

Defects in Negatives.

Foggy Negatives.— Caused by over-exposure; white light entering camera or dark room; too much light during development; decomposed pyro; introduction of hypo or nitrate of silver into the developing solution from the fingers or from tablets used for wet plates; developer too warm or containing too much carbonate of soda or potassium.

Weak Negatives with Clear Shadows.— Under-development.

Too Strong with Clear Shadows.— Under-exposure.

Weak Negative with Plenty of Detail in the Shadows.— Want of intensity, caused by over-exposure. Shorter exposure with longer development will, in most cases, produce sufficient intensity; and the addition of more pyro stock solution to the developer will seldom be necessary.

Fine Transparent Lines.— Using too stiff a brush in dusting off plates.

Transparent Spots and Pin-holes.— Dust on plate or in camera, or scum on old developer, or air bubbles while developing. Developer must be perfectly clean.

Crystallization on the Negative and Fading of Image.— Imperfect elimination of the hypo.

Yellow-colored Negatives are caused by not using enough sulphite of sodium in developer, or if the article used is old and decomposed.

Yellow Stains are caused by using old hypo bath which has assumed a dark color, or by not leaving plate in hypo bath long enough.

Mottled Appearance of Negative is caused by precipitation from fixing bath containing alum, if the solution becomes old or if it is turbid.

Toning Formulas.

Aristo-Platino Paper.

Negatives should be fully timed and slowly developed. Print to good depth. Tone first in a plain gold bath, made slightly alkaline with borax, to a point which is reached immediately after the whites have cleared up. Then wash through three changes of water, and tone in a platinum bath prepared as follows:

Stock Solution.

Water	2 ounces.
E. A. Platinite	15 grains.
Phosphoric acid (50 per cent. solution)	2½ drachms.

To tone, take one drachm of above stock solution to twenty ounces of water. If this is not strong enough to give the desired tones in six to eight minutes, add more stock solution.

Aristo Single Toner.

A toning agent giving platinum black tones on aristo-platino paper without preliminary gold toning, combining in one bath the action of the gold and platinum baths.

Printing should be very deep, tinting the high lights. Pay no attention to the shadows. Print for the high lights and half-tones.

Wash prints through five changes of cold water. Flatten prints a little in first water and keep them face down during washing.

After washing, prints are ready for toning in the following bath:

Water, 30 ounces; single toner, 1 to 1½ drachm.

When prints are first placed in the bath, they are liable to become a muddy pink in the half-tones and show unevenness of tone. This need not cause any uneasiness. Sufficient toning will remove the muddiness, and produce an even tone. Carry toning to the point where prints are clear in the high lights and half-tones, and are black in the deep shadows. Owing to the condition of water in certain localities, a toning bath made according to directions will tone or bleach out the high lights and half-tones before the shadows are toned; and, if the toning is carried deep enough to obtain a black in the shadows, the half-tones will be entirely destroyed. In cases of this kind a change should be made in toning bath. Instead of using all single toner, use two-thirds single toner and one-third aristo-platinum solution. This will prevent bleaching, and produce excellent tones. Never use more single toner than directions call for, and never strengthen an old or exhausted bath by adding fresh stock solution: either make up the bath large enough to tone the full batch of prints or strengthen the bath when it becomes exhausted by adding aristo-platinum solution. The platinum solution may be added to bath freely without any danger of bleaching prints, but the addition of more single toner solution will cause bleaching. A very cold toning bath will not work freely. For this reason during cold weather, or at any time when water used is very cold, bath should be warmed to about 75° or 80° F.

After toning, place prints in a tray of fresh water. When all toned, give them two or more thorough changes of water and fix ten to fifteen minutes in a fixing bath, 18° hydrometer test. To make fixing bath by weight, use 1 ounce of hypo crystals to each 20 ounces of water. See that prints are well separated when first placed in the bath, and keep them separated during fixing.

After fixing, wash one hour in running water, or ten to twelve thorough changes, if washed in a tray by hand. After final washing, mount prints with fresh starch paste in the usual way. Spread mounted prints out on a table or drying rack, and allow them to become perfectly dry before taking them up.

Aristo Junior Paper.

Print until the high lights are well tinted. Wash out all free silver by five changes of water. Tone in a plain gold bath made slightly alkaline with borax. Speed of bath, six to eight minutes. Fix in a plain hypo bath, testing 12° by the hydrometer, for ten minutes.

Aristo Blue Label Paper.

Print but slightly deeper than desired, when finished. Wash in five changes of warm (not hot) water. On pouring off last warm water, allow the prints to stand in cold water while waiting to be toned. Tone in any good gold bath, of such strength as to require six to eight minutes for a warm tone to be reached. As prints come from toning bath, place them in a tray of water made slightly acid with acetic acid. Fix in hypo bath, 10° to 12° hydrometer test, or 1 ounce of a saturated solution of hypo to every 16 or 18 ounces of water.

Albumen Paper.

Chloride of gold	1 grain.
Acetate of sodium	30 grains.
Water	8 ounces.

This must not be used till one day after preparation. It keeps well, and gives warm, rich tones.

Chloride of gold	1 grain.
Bicarbonate of sodium	4 grains.
Water	8 ounces.

This is ready for immediate use after preparation, but it will not keep.

Chloride of gold	1 grain.
Phosphate of sodium	20 grains.
Water	8 ounces.

This gives rich tones of a deep purple nature, but must be used soon after preparation.

Gold solution	10 drachms.
Acetate of lime	20 grains.
Chloride of lime	1 grain.
Tepid water	20 ounces.

The "gold solution" before mentioned is prepared by neutralizing as much as is required of a one-grain solution of chloride of gold by shaking it up with a little prepared chalk, then allowing it to settle, and filtering off the clear liquid. This toning bath improves by keeping. To use, add 2 ounces of it to 8 ounces of tepid water, which will prove sufficient to tone a full-sized sheet of paper.

Chloride of gold	15 grains.
Water	5 ounces.

Neutralize with lime-water, make up to 15 ounces with water, and add 2 drachms of chloride of calcium. This stock solution will keep for a long time. For use, dilute 1 ounce with 10 ounces of water.

Combined Toning and Fixing Baths.

Hyposulphite of soda	3 ounces.
Nitrate of lead	60 grains.
Chloride of gold	6 "
Water	24 ounces.

Blue Print Formulas.

No. 1.

Citrate of iron and ammonia	1 $\frac{7}{8}$ ounces.
Water	8 "

No. 2

Ferricyanide of potassium	1 $\frac{1}{4}$ ounces.
Water	8 "

Mix equal parts of No. 1 and No. 2, and apply with brush or by floating for three minutes. Plain Rives paper should be used. Hang up to dry in darkened room.

Black Lines upon a White Ground.

Gelatine	3 drachms.
Perchloride of iron solution (U. S. Ph.)	6 "
Tartaric acid	3 "
Ferric sulphate	3 "
Water	9 ounces.

Filter off any precipitate that may be found, and coat any good, stout white paper with the full-strength solution. Expose in sunlight till details or lines are visible, and develop with

Gallic acid	6 drachms.
Alcohol	6 $\frac{1}{2}$ ounces.
Water	32 "

Wash well in several changes of water.

The sensitizing solution is as follows:

Gum arabic	15 grams.
Tartaric acid	2 "
Chloride of sodium (common salt)	9 "
Sulphate of iron	10 "
Iron perchloride	15 "
Water	110 cc.

In mixing the solution, the gum arabic is first dissolved in the water by the aid of heat, and the other salts are added while the solution is still warm.

The solution is spread over the surface of the paper with a sponge, and, after allowing a little time for it to penetrate the surface, all superfluous moisture is removed, using the sponge again well wrung out. If this precaution be not attended to, the depth of the lines is not equal. The paper is then dried as quickly as possible. If the drying is not rapid, the whites stain.

Exposure is somewhat longer than would be needed with sensitized albumenized paper. The color of the sensitized paper is yellow. During exposure all but the lines turn to white.

Development is by a plain aqueous solution of gallic acid, the strength of which is not important. Care must be taken not to leave the print too long in the developer, otherwise staining will result. After development the print is rapidly washed, when superfluous moisture is carefully sponged off the surface. If this precaution be not observed, inequality in the depth of the lines will result.

Miscellaneous Formulas.

Mountants.

Best thin glue	3 ounces.
Golden syrup	$\frac{3}{4}$ ounce.
Alcohol	3 ounces.
Water	3 "

Soften the glue in 2 ounces of the water, heat gently in a pan of hot water, add the syrup (refined molasses), add the other ounce of water to the alcohol, and pour into the jar under constant stirring.

Non-cockling Paste.

Nelson's No. 1 gelatine	4 ounces.
Water	16 "
Glycerine	1 ounce.
Alcohol	5 grains.

Dissolve the gelatine in the water, then add the glycerine, and then the alcohol.

Colonel J. Waterhouse's Developer for Producing Reversed Negatives.

A.

Lithium carbonate sal. sol.	1 ounce.
Eikonogen	5 grains.
Sodium sulphite	5 "

Dissolve the two latter in the first just before using it, and add a few drops of

B.

Ammonium bromide	1 part.
Thiocarbamide	3 parts

Dissolve in water.

To clean Negatives stained by Silver.

Take a plug of cotton wool and wet it well with a weak solution of cyanide of potassium: rub gently all over the negative, using a little more force on the stained parts. Wash well. Dry on blotting-paper. If necessary to revarnish, flood the plate once or twice with methylated spirit. Let dry, and then varnish in the ordinary way.

To remove Yellow Stain caused by Developer.

Sulphate of iron	3 ounces or 90 grams.
Sulphuric acid	1 ounce " 30 ccm.
Alum	1 " " 30 "
Water	20 ounces " 600 "

If, after developing and fixing your negative, it is found to be stained yellow from the pyro or hydrochinon developer, first wash well to remove all hyposulphite, then immerse in above solution until the stain is removed. Again wash well, and dry.

To remove Silver Stains from Negatives.

Iodine	5 grains.
Potassium iodide	20 "
Water	$\frac{1}{2}$ ounce.

When the iodine is dissolved, add, while stirring, a few drops of a strong solution of hypo until solution becomes colorless. Apply to the spot with the soft end of a finger or a tuft of absorbent cotton, rubbing gently. Rinse well, and dry.

*Soaking Solution for Films.***Blair.**

Water	16 ounces.
Alcohol	4 "
Glycerine	$\frac{1}{2}$ ounce.

Eastman.

Glycerine	1 ounce.
Water	32 ounces.

To strip Film from Ordinary Plates.

Give negatives two coats of 2 per cent. collodion. The following formula yields good results:

Negative cotton	30 grains or 2 grams.
Ether	1 ounce, 6 dr. or 50 cc.
Alcohol	1 " " " "

Allow the first coat to dry before applying the second; and, when second coating has set, place immediately in cold water until greasiness has disappeared, then place in a bath of

Sodium fluoride (com.)	5 drachms or 20 grams.
Water	5 ounces " 160 cc.

When thoroughly saturated with this solution, which will take at least an hour, place without washing in

Sulphuric acid	1 drachm or 4 cc.
Water	7 ounces " 196 cc.

Rubber trays should be used for this and the fluoride bath. When film begins to loosen, lay a piece of writing paper or celluloid upon it as a support, and separate the two from the glass. After washing well under tap, it can be transferred to a permanent support.

The following will answer the purpose: coat a clean glass plate which has been rubbed with French chalk and dusted with

Gelatine	2 $\frac{1}{2}$ ounces or 75 grams.
Glycerine	3 drachms or 10 cc.
Water	16 ounces " 500 cc.

Filter before coating through canton flannel, and avoid air bubbles. Coat on a levelling stand as thick as the plate will hold: allow to set and dry.

Clearing Solution.

Powdered alum	60 grains.
Sulphuric acid	60 minims.
Water	20 ounces.

A Substitute for Varnishing.

Alum	2 ounces.
Tannic acid	1 drachm.
Water	16 ounces.

Immerse negative for from three to five minutes. Too long an immersion will loosen the film. Films so treated are almost waterproof.

Varnish for Celluloid Films.

Powdered amber	5 parts.
Chloroform	45 "
Coal-tar benzine	45 "
Gum dammar	7 $\frac{1}{2}$ "

The mixture should be allowed to stand in a warm place for some time, and should be decanted twice before using.

Ground Glass Varnish.

Sandarac	90 grains.
Mastic	20 "
Ether	2 ounces.
Benzole	$\frac{1}{2}$ to 1 $\frac{1}{2}$ "

The proportion of the benzole added determines the grain of the matt obtained.

Retouching Varnishes.

Sandarac	1 ounce.
Castor oil	80 grains.
Alcohol	6 ounces.

First dissolve the sandarac in the alcohol, and then add the oil.

Copaivic acid	$\frac{1}{4}$ gram.
Dammar	$\frac{1}{2}$ "
Ether (strongest)	50 cc.
Gasoline	120 "

Dry the dammar by heating until melted. When quite cold, powder, and dissolve in the ether. Then add the copaivic acid, and finally add the mixture to the gasoline.

Gum dammar	1 part.
Oil of turpentine	5 parts.
Strong solution of gum myrrh in oil of turpentine.	

Negative Varnishes.

Sandarac	4 ounces.
Alcohol	28 "
Oil of lavender	3 "
Bleached shellac	1 1/4 ounces.
Mastic	1/4 ounce.
Oil of turpentine	1/4 "
Sandarac	1 1/4 ounces.
Alcohol	20 fluid ounces.

Silvering Mirrors.

The glass plate to be silvered must be absolutely clean.

A. Silver nitrate	175 grains.
Distilled water	10 ounces.
B. Nitrate of ammonium	262 grains.
Distilled water	10 ounces.
C. Pure caustic potash	1 ounce (avoir.).
Distilled water	10 ounces.
D. Pure sugar candy	1/2 ounce.
Distilled water	5 ounces.

Dissolve, and add
Tartaric acid 50 grains.

Boil in a flask for ten minutes, and, when cool, add

Alcohol	1 ounce.
Distilled water to make	10 ounces.

For use take equal parts of *A* and *B*. Mix together also equal parts of *C* and *D*, and mix in another graduate. Then mix both together in the silvering vessel, and suspend the mirror face down in the solution.

Coloring Photographs.

The finely powdered colors are mixed with the following:

Filtered albumen	100 cc.
Ammonium carbonate	5 grains.
Glycerine	3 cc.
Liquid ammonia	4 "
Water	25 "

Black for Woodwork.

Shellac	40 parts.
Borax	20 "
Glycerine	20 "
Water	500 "

After dissolving, add 50 parts aniline black.

For Writing on Glass.

Bleached shellac	2 parts.
Venice turpentine	1 part.
Oil of turpentine	3 parts.
Lampblack	1 part.

Warm the first three ingredients together over a water-bath, and then stir in the lampblack, incorporating thoroughly.

Printing on Silk.

Wash the silk in warm water, and float for two minutes on the following solution:

Salt	10 grains.
Ammonium chloride	10 "
Ammonia	15 drops.
Water	1 ounce.

Then hang the silk up to dry. Sensitize in

Silver nitrate	150 grains.
Water	1 ounce.

After floating on this for two minutes, dry, print deeply, and tone in ordinary manner.

Test for Hypo in Wash Water.

Permanganate of potash	3 grains.
Caustic soda	15 "
Water	16 ounces.

A few drops of the water to be tested are mixed with a few drops of this solution. If hypo is present, the red color will change to green.

Varnish for Plate-holders and Camera Interiors.

Bleached shellac	5 ounces.
Borax	1 ounce.
Water	20 ounces.

Digest at nearly boiling point until dissolved; filter through muslin.

Shellac	4 ounces.
Borax	1 ounce.
Glycerine	1/2 "
Aniline black	2 ounces.
Water	20 "

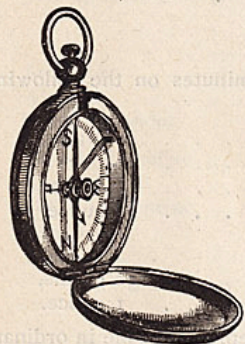
Comparative Strength of Various Lights.

Gas flame	1
Oxy-hydrogen light	11
Magnesium ribbon	58
Diffused daylight	268
Electric light	5179
Sunlight	16079

Color Screen.

Saturated alcoholic solution of "brilliant yellow"	4 ounces.
Pyroxyline	40 grains.
Ether	4 ounces.

COMPASSES.



Intimately connected with photography is the instinct of roaming and wandering, oftentimes away from beaten paths in search of hitherto undiscovered beauties. The photographer of wild animate nature can never know where he must go for his quarry. To these, as well as to others, we call attention to compasses.

As everybody knows what a compass is, we will only say that we have some beautiful compasses, watch-like in appearance, in black oxidized cases, also in brass cases, with removable cover, needle pointers; also the familiar floating dial form, cased in boxes and suitable for yachts, etc.

From 35c. upward.

BAROMETERS.



Probably the Aneroid Barometer is as popular for ascertaining altitudes as for forecasting atmospheric conditions.

The registrations of a fine aneroid are closely correct.

A fine instrument must be made with precision, as slight errors in dividing the scale may make great variations in reading.

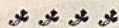
We test each instrument with an accurate mercurial barometer especially contrived for this purpose, which enables us to compare and guarantee the correctness of our aneroids.

From \$6.00 to \$25.00.



The Mercurial In long oak frames, nicely finished, and excellently suited for permanent hanging in halls, libraries, etc.

Microscopes

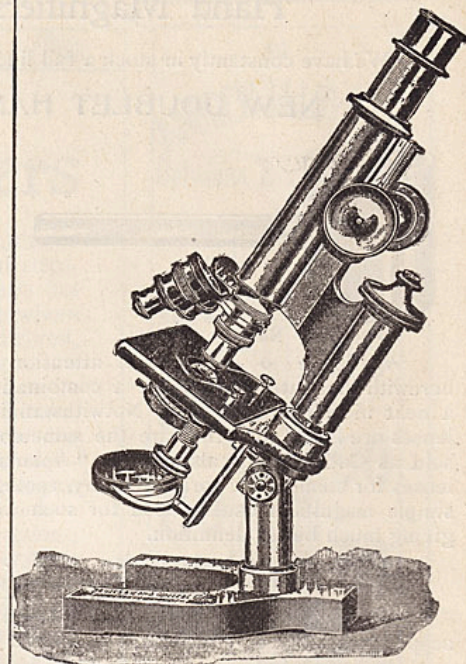


Accessories



Laboratory

Supplies



We carry a full line of Microscopes, Accessories, and Supplies. We have in stock constantly Microscopes suited to the wants and conditions of all.

Our Boys' Compound Microscope, which we offer for \$2.00, is not a toy, as the price might indicate, but an instrument of real merit and suitable for many kinds of elementary work. It has a magnifying power of 75 diameters, and may be the means of affording amusement to any boy or girl, and of giving much instruction as well.

Our Practical Microscope, which, together with a full working outfit, we furnish for \$16.00, is well adapted for all household and practical purposes. It has a magnifying power of 180 diameters, or over 32,000 times. It is well adapted for the examination of starches and all food products, cements, earths, drugs, fibres, and fabrics. It will also serve a good purpose in such elementary biological work as is laid down in common school and industrial courses.

For physicians and laboratories we offer our *BB Continental Outfits* (one of which is herewith illustrated). That this microscope meets the wants of those who need a complete working outfit for scientific purposes, we need only cite the fact of its wonderful and rapid growth in popularity, being now in constant use by a majority of the educational institutions, hospitals, and thousands of physicians all over the Western world and in Europe. We offer these microscopes with various outfits of lenses and accessories at the lowest possible prices, confident that they will merit the approval of all who use them.

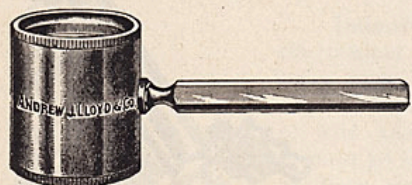
In connection with our Microscopic Department we carry a full line of *Microscopical and Laboratory Supplies*, and invite correspondence from all persons interested in biological work.

Estimates and information will be cheerfully furnished on application.

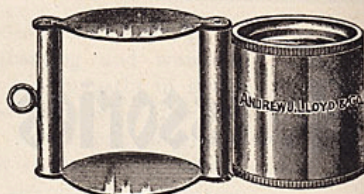
Hand Magnifiers and Lenses.

We have constantly in stock a full line of hand and pocket magnifiers.

NEW DOUBLET HAND MAGNIFIERS.



No. 6.



No. 7.

We desire to call special attention to our new doublet hand magnifiers, herewith illustrated, which are a combination of two lenses accurately mounted in a neat nickelled mounting. Notwithstanding the very low prices at which these lenses are being sold, they are the same construction as the imported lenses, often sold as Coddingtons, also as the "Aplanatic Magnifiers." They are very good lenses for elementary work in botany, zoology, etc., and give better results than the simple magnifiers usually used for such work, having larger and flatter field, and giving much better definition.

No. 6. Doublet hand magnifier,	\$0.75
No. 7. Doublet hand magnifier, in folding pocket case,	1.00

Our series "A" doublets (five different powers), for use with dissecting microscopes, are deservedly popular, and offered at a very low price.

We offer a full line of Coddington, Aplanatic, and Hastings triplet lenses, made up for use either as hand magnifiers or in connection with our dissecting stands.

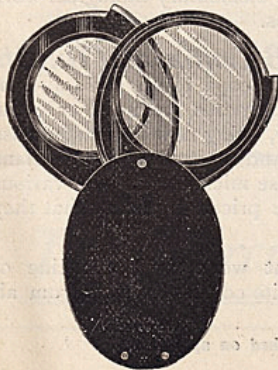
The Hastings triplets are made after a formula of Professor Hastings, of Yale College, and are distinguished for their flatness of field and clear defining power. Any one who wants a fine lens for use in any department of natural history or in the practical walks of life should not fail to own one of these unexcelled lenses.

To put in the hands of boys or girls who are not old enough to intelligently use a compound microscope, or for the use of pupils in elementary botany and zoology, nothing is better than our

BRASS TRIPOD MAGNIFIERS.

We furnish them so cheaply that every school should be fully equipped with them, giving one to each pupil.

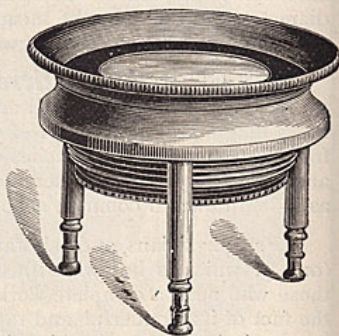
Price, 35c.



Rubber Magnifiers.

Our stock of rubber magnifiers is complete, having them with one, two, and three lenses, and of all sizes, and at prices ranging from 20 cents upwards. Special prices will be made when ordered in quantities for educational purposes.

We solicit correspondence with schools, colleges, and all institutions or individuals using magnifiers of any kind, dissecting microscopes, instruments, and supplies. Prices cheerfully furnished on application.



Thermometers

From the camera to the weather, thence to thermometers, are easy and natural steps. Our experience for the past three years has shown us that there are many people to whom the weather is of much more than casual interest, and who are without satisfactory instruments for noting it, and who do not know where to get a good thermometer or how much it costs.

We make a brief mention of some of the Thermometers we have and their uses: Self-registering, show the highest and lowest degree of temperature reached; Radial Thermometers, exposed to the atmosphere in all directions, give the best obtainable average temperature, very useful for sleeping and living rooms; Garden Thermometers, for taking temperature above and under ground; Bath Thermometers, that will float; Cooking Thermometers, for testing ovens, etc.; Thermometers specially made for testing great degrees of cold.

Let us draw especial attention to the excellence of our

Out-of-doors Thermometers

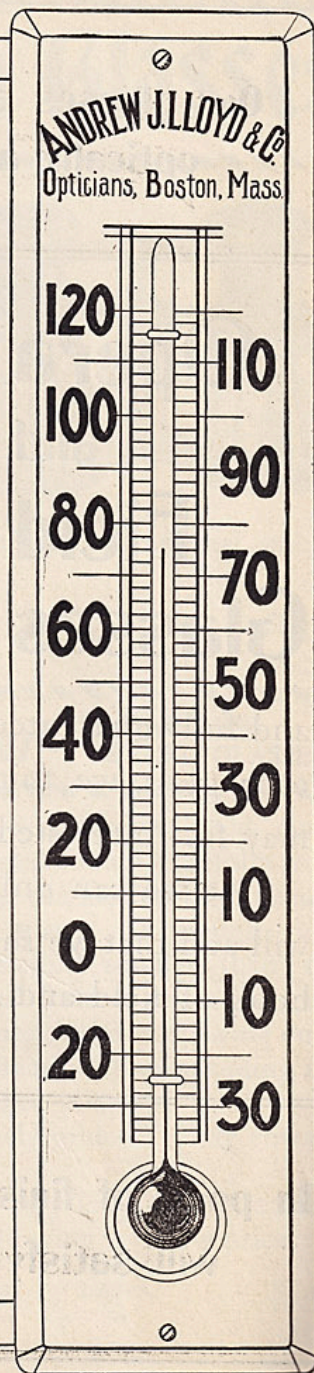
These are made of plate glass,

are strongly and plainly marked in black, and are very reliable indicators of the outside air. They are furnished with strong nickel brackets and screws, and are easily attached outside convenient windows. We sell great numbers each year, and they have given entire satisfaction.

... PRICES ...

8 inches long,	\$0.75
10 " "	1.00
12 " "	1.25

Our thermometer book will soon be ready. Send two two-cent stamps.



Our glasses are thoroughly reliable
optically and in construction.

Opera and Field Glasses

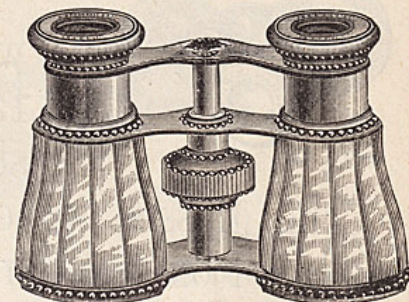
We have never sought before to advertise our department of opera and field glasses beyond the limits of Boston; but as we are large importers of fine glasses, and as we sell them at low prices, and fully guarantee (money refunded, if desired) each glass, we think that many of our readers may feel interested.

As we can only quote a few styles here, we will add that we shall be glad to send our special book of field and opera glasses to any applicant.

In point of finish, style, and beauty they
will satisfy the most requiring.

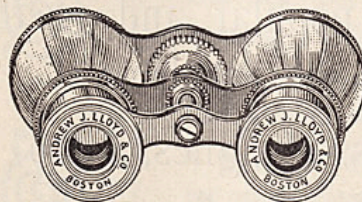
Pearl Opera Glasses

Nos. 2035 and 2040 are among the most popular glasses we display. The lenses are well corrected, and afford remarkable definition. Their magnifying power is calculated for excellent results. The metal parts are of richly gilded brass. The body and the eye-pieces are made of carefully selected and finely finished pearl, in shades of oriental, smoke and white.



No. 2035 has an object glass of 13 lignes. Price . \$6.50
No. 2040 " " " " " 15 " " . 7.50

Extraordinary Offer OF MARQUISE PEARL GLASSES



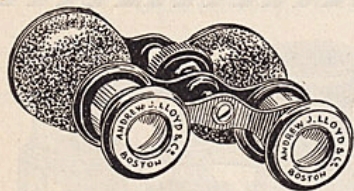
Seekers for good opera glasses should carefully consider the merits of this beautiful glass. Although fully one-third smaller than the usual form of opera glass, the *Marquise* has surpassing qualities of field, definition, and illumination, thus affording the observer a clear, bright, and extended view.

Draw-tubes and cross-bars finely gilded. Body covered with pearl.

We import above glasses in very large quantities, thus enabling us to offer them at the following very low prices:—

No. 2001. Diameter of object glass 14 lignes, . \$5.00
No. 2002. " " " " 15 " . 5.50

BLACK MOROCCO



Black opera glasses will never go out of fashion: they are standard.

The glasses we offer below are well made, of oxidized or japanned brass, and covered with black morocco.

They are of very nice appearance, and are reliable, serviceable glasses for general use.

Because of their sterling qualities and the low prices at which we sell them, these glasses are very popular, and great numbers of them are sold each year.

No. 2005. Object glass 13 lignes, \$3.50

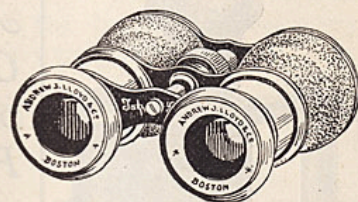
No. 2010. " " 15 " 4.50

No. 2015. " " 17 " 5.50

Our name is on each glass.

OPERA GLASSES.

BIRD GLASSES.



We call Nos. 1986 and 1987 bird glasses because we designed them for the use of those who love

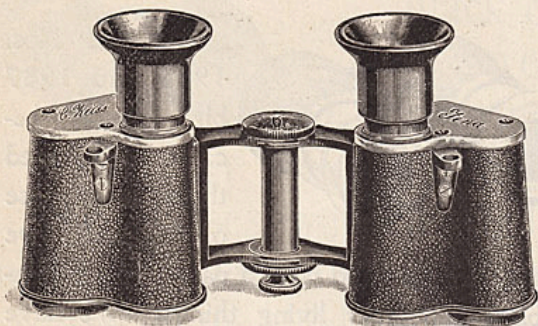
life out of doors and have a passion for watching birds and other living things. We have therefore produced a glass that is small as compared with a field glass, and so light that it can be held before the eyes for a long time without fatigue, and carried without a sensation of weight or bulk. The optical parts are constructed with the purpose of affording a large area or field of view,—to produce a bright and clear but not excessively magnified image in natural colors. We have received enthusiastic letters of praise for this glass, and believe that it is unexcelled for the purpose for which it is primarily designed. It is not unsuitable for opera glass purposes, and is, all together, a handy little instrument. Metal parts are brass, oxidized or japanned; body, black leather. Price includes a case and strap.

No. 1986. 17 lignes, . . . \$7.00

No. 1987. 19 " . . . 8.00



The Zeiss Field Glasses



*Are
Constructed
on
Principles
wholly
different*

From the more familiar types of field glasses. In the Zeiss glasses the object glasses (the lenses furthest from the observer's eye) are weak in power. These collect a large amount of light, and in the usual styles would require an instrument with long body. Zeiss overcomes this by means of reflecting prisms, which bend the rays of light, very much as worsted is folded in hanks. Consequently the Zeiss glass is much reduced in bulk. In the standard forms the image is inverted, and has to be righted by the eye-piece. In the Zeiss glass the image is erected by the prisms.

The Zeiss glass, while less in size and bulk, gives a finer view than the usual type of glass of equal power. This alone is a great achievement. But in addition Zeiss has made his glasses so that the objectives are wider apart than the eye-pieces. This very much enhances what is known as stereoscopic effect. It is stereoscopic effect that gives us notions of length, breadth, and thickness, size, distance, space, etc.

There are no glasses made that give these realistic qualities to the objects in view as the Zeiss glasses do: they even improve upon human vision in this respect.

When we first imported them, they created great astonishment among the scientific men, professional and amateurs. One gentleman wrote to us to say that he had carried his Zeiss on a severe geological trip in the Yellowstone Park district. It was peerless for mountain work. He even used it at night; and, notwithstanding its hard service, the adjustment was undisturbed and the glass uninjured.

*Another
gentleman
wrote us*

That those who love star-gazing would be surprised at the elegance of the views of the heavens obtained through a Zeiss at night. We supposed that the prices of the Zeiss glasses would limit their sale to a very few glasses every year, but were in error, as the demand increases steadily. The size numbered four is very suitable for an opera glass, and is generally used as such.

PRICES.

A. ZEISS FIELD GLASSES.

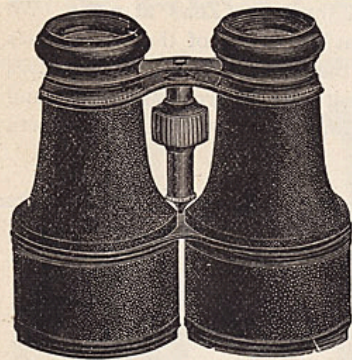
Magnification.	Price.	Code Word.
4 (Opera Style)	\$47.50	Telier.
6	51.00	Telex.
8	58.00	Telact.
5 (Night Marine)	72.50	Telefive.
7½ (Night Marine)	72.50	Teleseven.
10 (Day Marine)	80.00	Teleten.
12 (Day Marine)	80.00	Teletwelve.
5 and 10 (Combined Day and Night Marine)	100.00	Telemarine.

B. ZEISS STEREO-TELESCOPES.

Magnification.	Price.	Code Word.
8	\$65.50	Reliefact.
10	76.00	Relieften.

ZEISS MONOCULAR FIELD GLASSES.

Magnification.	Price.	Code Word.
4	\$22.00	Simplier.
6	24.00	Simplex.
8	27.50	Simplact.
5	33.00	Simpfive.
7½	33.00	Simpseven.
10	36.50	Simpten.
12	36.50	Simptwelve.



No. 1710.

Lloyd's Field and Marine Glasses.

We have a large quantity of field glasses of different sizes and coverings, and at different prices. We shall select a few for description that may be the most popular.

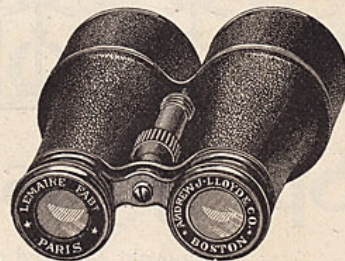
Style No. 1 (1710) is a first-rate glass for working use. Its moderate price (\$6) tends still more to increase its popularity. It is adjusted, or focussed, by sliding tubes operated by a milled head. It is covered with black morocco. The draw-tubes are oxidized or japanned. The object glasses are 24 lignes in diameter and have shades to keep out reflections. The price includes leather carrying case and strap.

Price, \$6.00.

No. 1730 is a marine glass. A marine glass requires a moderate magnification, but a large amount of illumination (which renders the view bright, clear, distinct, for night work) and a thorough correction for color. The glass here shown possesses these qualifications to a marked extent, and is well lighted and corrected, so that lights and signals can be determined in their proper shades. The metal parts of the instrument are brass, oxidized or japanned. The body and the sky shades are leather covered. The price includes a strong leather carrying case and strap.

Price, \$13.50.

Lemaire Field Glass.



No. 1750.

These are the product of a celebrated French maker, and are especially prepared for us, bearing our name as well as the maker's. The characteristics of the Lemaire glasses are beauty and strength of construction, elegance of finish and shape, and optical accuracy. We import quantities of these admirable instruments each year.

A WORD OF CAUTION

may not be out of place here. On account of the excellence of the Lemaire reputation, unscrupulous imitations have been offered to the public, which cannot be thoroughly informed. Thus, glasses marked Lamier, Lemaryer, Lemayre, Lemire, etc., are not *Lemaire* glasses.

No. 1750 is of oxidized brass, morocco covered. The object glass is 24 lignes in diameter. The price includes a stout leather carrying case and strap.

Price, \$13.50.

No. 1755 is similar to 1750, but has a larger object glass,—26 lignes instead of 24.

Price, \$15.00.

We believe that these are the lowest prices at which genuine Lemaire field glasses have been offered in this country.

Spy-glasses

A spy-glass ought to afford a bright, clear view of objects within a good-sized field of vision: there should be no distortion caused by imperfectly ground lenses, no annoyance by color fringes being formed, and no breaks in the image, caused by inaccurate centring.

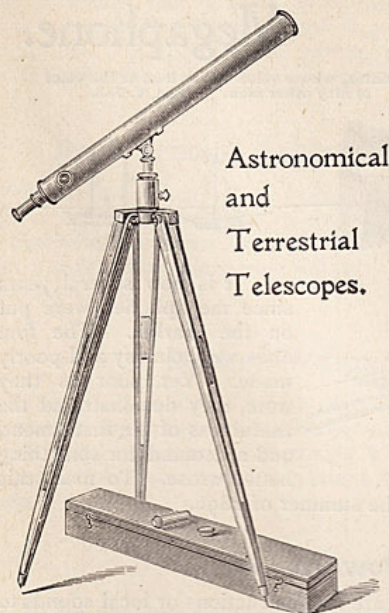
A good spy-glass is really a hand telescope, and can be productive of much pleasure. A poor one is not worth the having.

The lenses are carefully ground and thoroughly tested. They are achromatic; *i.e.*, they are so constructed that fringes or borders of color cannot be formed about the edges of the object under view. They are accurately placed in the tubes, so that they are correctly centred with respect to each other and the viewer's eye. The draw-tubes are of finely finished brass, sliding easily and fitting perfectly. The object glass (the lens furthest from the observer's eye) is protected from unpleasant reflections by means of sliding shades of suitable length.

- | | |
|---|---------------|
| 1625. Diameter of object glass, 10
lignes; power, 10 times . . . | \$2.25 |
| 1630. Diameter of object glass, 12
lignes; power, 13 times . . . | 3.00 |
| 1635. Diameter of object glass, 14
lignes; power, 16 times . . . | 4.00 |
| 1640. Diameter of object glass, 16
lignes; power, 20 times . . . | 5.50 |
| 1645. Diameter of object glass, 19
lignes; power, 25 times . . . | 7.50 |
| 1650. Diameter of object glass, 22
lignes; power, 30 times . . . | 10.50 |



TELESCOPES.



FIELD TRIPOD.
1670.

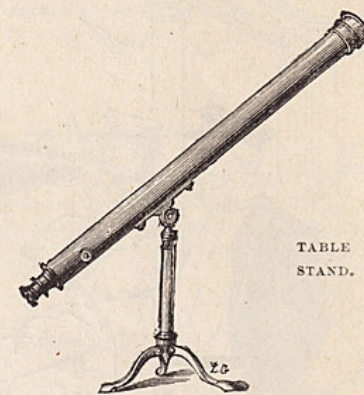


TABLE
STAND.

1670.

The object of a telescope is to produce an image of a remote object, sufficiently illuminated and magnified that details may be observed which are invisible or indistinct to the unaided eye. Consequently telescopes are useful, instructive, and pleasure-giving. On the piazzas of summer hotels, golf, yacht, or country clubs, or of country houses, in observatories, etc., they are always in use, and are the means of affording much pleasure.

One of the most recent examples of the use to which a telescope has been put is as a farming implement. A large farmer set up one of our \$75 instruments in about the centre of his property, and scrutinizes and directs all operations, far and near, in every direction.

Schools are including telescopes in their regular equipment, partly as object lessons and partly to serve in elementary astronomical instruction.

Many people have an idea that telescopes cost so much that it is not worth while to find out how much they do cost, or where they can be obtained. As the popular idea is so far wide of the mark on this point, we append specifications of a few instruments, and refer any one interested to our small pamphlet on the subject for more extended information.

- | | |
|--|--|
| <p>No. 1655. Brass; sliding tubes.
Object glass; diameter, 19 lignes.
2 eye-pieces; power, 25 and 50 times.
1 sun glass; to protect the eyes from too much glare.
1 tripod; short legs, suitable to mount the instrument on a table.
Walnut case for the instrument.
Price, \$18.00.</p> | <p>No. 1660. Brass; rack and pinion adjustment; rapid and exact focussing.
Object glass; diameter, 33 lignes.
1 celestial eye-piece; power, 110 times.
1 terrestrial eye-piece; power, 50 times.
1 sun glass.
Tripod, wooden; long legs; vertical and horizontal action.
A good, but not the finest, finish.
Price, \$50.00.</p> |
| <p>No. 1665. Brass; rack and pinion adjustment.
Object glass; diameter, 30 lignes.
1 terrestrial eye-piece; power, 45 times.
1 celestial eye-piece; power, 100 times.
1 sun glass.
1 long wooden tripod.
1 short brass tripod.
All in a case.
Price, \$65.00.</p> | <p>No. 1670. Brass; rack and pinion adjustment.
Object glass; diameter, 33 lignes.
1 terrestrial eye-piece; power, 50 times.
1 celestial eye-piece; power, 110 times.
Sun glass.
1 long wooden tripod.
1 short brass tripod.
Case.
Finish the very best.
Price, \$75.00.</p> |



The . . STENTOR Megaphone.

"Stentor, whose voice was as loud as the voice of fifty other men."—Iliad, v. 783.

It is now several years since megaphones were put on the market. The first ones were clumsy and poorly made. Yet, poor as they were, they demonstrated the usefulness of the instrument, and a demand for something better arose. To meet this

demand, Stentor megaphones were made in the summer of 1896.

Carrying Power.

Under ordinary conditions, where there are no obstructions or local sounds to interfere, the carrying power of a megaphone is astonishing. Even under adverse conditions it magnifies the power of the voice many times. The best results are obtained across open country or on the water, the carrying power depending upon the size of the megaphone, wind, and atmospheric conditions. At a test made in Boston Harbor with a Stentor megaphone, No. 2, 30 inches long, conversation was carried on over a measured mile. (The conditions at this trial were favorable, except for a light breeze across the line of conversation.) With the larger sizes records have been made for much greater distances.

The megaphone is also valuable in detecting and in listening to distant sounds, as, for example, in detecting a bell buoy in a fog.

Yacht Clubs.

One of the first places where megaphones were used was at yacht club houses. Members at once appreciated being able to speak from the club-house to yachts lying at moorings or sailing by; and now no well-equipped club-house is without its megaphone. (Sizes No. 3 or No. 4.)

Yachts.

As soon, too, as megaphones of moderate size were made, yachtsmen saw the value of having them on board their yachts. With one they can communicate with the club-house, or cottage on shore, or with other yachts. (Sizes, No. 1 to No. 2½.)

Country and Seashore Houses, Farms, Hotels, Echoes.

An instrument which increases the power of the voice, makes itself useful everywhere in the country or at the seashore. No summer home is complete with-

out one. Whether one wants to speak across to a neighbor's cottage, to some one on the lake or in the field, or merely to call the children to dinner, a megaphone is what is needed. On farms it is taking the place of the tin horn, and at summer hotels it supplies much amusement to guests. Wherever there is an echo, there is nothing like a megaphone for getting good results. In fact, with a megaphone you will wake echoes you never suspected.

Race Tracks, Athletic Games, Bulletin Boards.

Before megaphones came into use, men with powerful voices were employed to make announcements at race tracks, athletic games, and bulletin boards. Even the best voices, however, failed to make more than a part of the crowd understand. With a megaphone there is no difficulty in making the largest crowd hear. (Sizes, No. 2 to No. 4.)

Docks, Warehouses, Railroads.

Among other places where Stentor megaphones are employed are docks, warehouses, and railroads. Whether for calling along the dock or out to an approaching vessel, every wharfinger knows the value of making himself heard. Railroads, too, have found a place for megaphones in freight yards and signal towers.

How to use a Megaphone.

To get the best results from a megaphone, point it directly toward the person you wish to speak to. Hold the mouthpiece close to the mouth, and articulate distinctly. Try to throw the voice through the instrument and not merely into it. Don't bellow.

In listening for reply, hold the mouthpiece close to the ear, pointing the megaphone in the direction from which the sound is to come.

Construction and Finish.

Stentor megaphones are made from the best quality of chemical and fibre boards. All metal parts are brass, nickel-plated. The mouthpiece is seamless, and is attached without the use of rivets. The color is a rich mahogany. The greatest care is taken with workmanship and finish, resulting in a megaphone without equal.

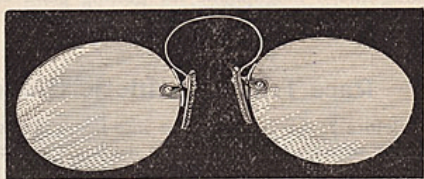
PRICE LIST ON STENTOR MEGAPHONES.

No. 1. 15-inch,	\$1.50
No. 2. 30-inch,	2.50
No. 2½. 34-inch,	3.00
No. 3. 40-inch,	3.50
No. 5. 48-inch,	5.00
No. 7. 60-inch,	8.00
Stand for No. 3, No. 5, or No. 7 (No. 7 to order only),	2.50
Rope, pulley, and cleat for suspending No. 3 or No. 5,	.75
18-inch aluminum megaphone,	3.00
34-inch " "	8.00
12-inch Junior megaphone,	.25
20-inch " "	.50

Mr. Wright lenses P. 25 + 43
also Dallmeyer (8x10) #40.

LP 1163

EYE-GLASSES AND SPECTACLES



IT MAY BE THAT SOME OF OUR READERS WILL VISIT BOSTON FOR THE SAKE OF THEIR EYES, OR MAY BE IN NEED OF THE SERVICES OF AN OPTICIAN TO MAKE OR TO REPAIR EYE-GLASSES OR SPECTACLES. A FEW WORDS ON THIS SUBJECT WILL CLOSE OUR CATALOGUE.

NO FORM OF OPTICAL INSTRUMENT REQUIRES NICER ATTENTION AND ADJUSTMENT THAN THOSE COMMON NECESSITIES, EYE-GLASSES OR SPECTACLES. AN ILL-SUITED PAIR OR AN ILL-ADJUSTED PAIR IS OFTEN WORSE THAN NO GLASSES AT ALL. WE HAVE AN EXPERIENCE OF THIRTY YEARS IN MAKING AND ADJUSTING GLASSES TO ALL KINDS OF CASES. WE HAVE A LARGE FORCE OF WELL TRAINED WORKMEN, SO THAT WE CAN MAKE A PAIR OF GLASSES IN THE SHORTEST POSSIBLE TIME. OUR WORK IS ALL INSPECTED TWICE AT LEAST, AND IS FULLY GUARANTEED.

WE RECEIVE A GREAT MANY GLASSES BY MAIL EVERY DAY FOR REPAIRS, DUPLICATION, ETC., AND ARE USUALLY ABLE TO RETURN THEM IN GOOD ORDER BY A LATER MAIL ON THE SAME DAY.

OUR PRICES WILL BE FOUND SATISFACTORY AND LOW.

ANDREW J. LLOYD & CO.

DISCOUNT SHEET.

Discount may be deducted from list prices quoted in our catalogue at the rate printed in this Discount Sheet opposite the names of the articles, which are arranged in alphabetical order.

Papers, Miscellaneous.

English Tissue,	Net.
Post-office,	"

Pass-partouts.

.	10 per cent.
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Paste.

Anti-cockle,	10 per cent.
Carter's,	10 " "
Higgins's,	10 " "
Kollos,	10 " "

Pencils and Holders.

.	Net.
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Photoscript.

.	Net.
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Plumb Indicators.

Thornton-Pickard,	Net.
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Preservers.

Negative,	10 per cent.
Film,	10 " "

Print Washers.

California,	Net.
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Prisms.

.	Net.
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Proof Envelopes.

.	10 per cent.
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Racks.

Negative,	20 per cent.
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Ray Filters.

.	10 per cent.
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Reducing Glasses.

.	Net.
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Retouching Colors.

.	10 per cent.
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Retouching Glasses.

.	Net.
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Retouching Solutions.

.	Net.
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Retouching Varnishes.

.	Net.
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Roll Holders.

.	Net.
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Rollers, Print.

Double,	20 per cent.
Single,	Net.

Rubber Goods.

Aprons,	Net.
Finger Tips,	"
Gloves,	"
Squeegees,	10 per cent.

Scales and Weights.

Beam Scales,	10 per cent.
Déposé,	10 " "
Dispensing,	10 " "
Prescription,	10 " "

Shutters.

Bausch & Lomb Diaphragm,	10 per cent.
Gundlach,	10 " "
Thornton-Pickard,	10 " "
Triplex,	10 " "
Unicum,	10 " "
Victor,	10 " "

Solutions, Toning.

Solio,	10 per cent.
Rayon,	10 " "

Speed Testers.

Pickering's,	Net.
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Spotting Colors.

.	10 per cent.
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Squeegees.

.	10 per cent.
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Thermometers.

.	Net.
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Thimbles.

.	10 per cent.
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Trays.

Fibre,	40 per cent.
Glass,	10 " "
Glossy Rubber,	Net.
Hard Rubber { deep, dull }	10 per cent.
{ finish, }	10 " "
Papier-maché,	10 " "
Porcelain,	10 " "
Vulcanite,	10 " "

Trimmers.

Lloyd's Rotary,	Net.
Diamond,	"
Dandy,	"
Premium,	"
Studio,	"

Tripods.

Eastman,	20 per cent.
Lloyd's,	20 " "
R. C. Co.,	20 " "
R. O. Co.,	20 " "

Varnishes.

Lloyd's Retouching, etc.,	Net.
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Vignettters.

Dixie,	10 per cent.
Farand,	10 " "
Waymouth's Vignette Papers,	Net.

Washing Boxes.

Adjustable,	10 per cent.
Pet,	15 " "
Scovill,	10 " "
Scovill Universal,	10 " "
Simplex,	10 " "

As the price of photographic material varies, discounts are subject to change without notice.

Albums.

Badger,	15 per cent.
Badger Flexible,	15 " "
Gilson,	Net.
Photog,	15 " "

Backgrounds.

.	Net.
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Binders for Lantern Slides.

Rolls,	10 per cent.
Strips,	10 " "

Blotters.

Heavy,	10 per cent.
Light,	10 " "

Books.

.	Net.
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Brushes.

Camel's-hair, Rubber Bound,	10 per cent.
" " Tin " "	20 " "
" " " "	20 " "
" Rubber " "	10 " "
Sable,	Net.

Burnishers.

Acme,	10 per cent.
Brilliant,	10 " "
Entrekin,	10 " "
Globe Enameller,	10 " "
Lustre,	10 " "
Model Duplex,	10 " "

Cameras.

Adlake,	Net.
Cyclone Magazine,	"
Dayplate,	"
Eastman,	"
Gem Poco,	20 per cent.
Hawkeye,	20 " "
Korona,	20 " "
Monroe,	20 " "
Magazine Poco,	20 " "
New York Outfits,	20 " "
Nodark,	Net.
Photo-Micro,	10 " "
Poco,	20 " "
Premo,	15 " "
Ray,	20 " "
Ray Folding,	20 " "
Reko,	"
R. C. Co.'s View,	20 per cent.
R. O. Co.'s View,	20 " "
Special Outfit (page 117),	15 " "
Twin Lens Montauk,	15 " "
Vista,	Net.

As the price of photographic material varies, discounts are subject to change without notice.

Caps.

For Lenses,	Net.
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Card Mounts.

Collins,	15 per cent.
Tarjo,	20 " "

Cartridges.

Film,	Net.
Lloyd Flash,	10 per cent.
Scovill " "	10 " "
Sun " "	10 " "
Sunlight,	10 " "

Cases, Carrying.

Eastman,	Net.
Ray Box,	20 per cent.
Others, same discount as cameras.	

Cases, Photo.

Leather,	Net.
Leatherette,	"

Chairs.

Alaska,	15 per cent.
Elite,	10 " "

Chemicals.

.	Net.
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Clamps.

For Bicycle Carrying Cases,	20 per cent.
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Clips.

Lockwood's,	Net.
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Cloth.

Focussing,	30 per cent.
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Collodion.

.	Net.
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Cottons.

Dennison's Absorbent,	Net.
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Developers.

Adurof,	10 per cent.
Amidol,	10 " "
Carbutt's Metal Hydro,	10 " "
Diphenal,	10 " "
Diogen,	10 " "

Developers (continued).

Eastman,	10	per cent.
Eikonogen,	10	" "
Glycin,	10	" "
Glyco Pyro,	10	" "
Hydroquinone,	10	" "
J. C. Tablets,	10	" "
Karma Tablets,	10	" "
Lloyd's Prepared,	10	" "
Metacarb,	10	" "
Metol,	10	" "
Mitchell's Prepared,	10	" "
Ortol,	10	" "
Pyro (Schering's),	10	" "
" (Lloyd's),	10	" "
Rodinal,	10	" "
Seed's Prepared,	10	" "
Stanley,	10	" "
Trenol,	10	" "
Velox (powders), tubes,	10	" "
" " " cans,	20	" "

Developing and Printing.

Net.

Dry Plates.

American,	40 & 5	per cent.
Carbutt Eclipse, Jr.,	40 & 5	" "
" " Nos. 23-27,	25	" "
" Keystone, B. & A.,	25	" "
" Non-halation,	15	" "
" Lantern (Opals),	10	" "
" Ortho Portrait,	20	" "
" Transparency,	10	" "
Cramer Banner,	25	" "
" Crown,	20	" "
" Isochromatic,	15	" "
" Non-halation,	10	" "
Cyclone,	40 & 5	" "
Eastman,	30	" "
Hammer,	30	" "
" Non-halation,	25	" "
New York,	40 & 5	" "
Seed, No. 27,	25	" "
" 26x, 23, 16,	25	" "
" Non-halation,	15	" "
" Opals,	10	" "
" G. B. P. R.,	15	" "
" Lantern,	10	" "
" Transparency,	10	" "
Standard, Nos.	40 & 5	" "
" Non-halation,	40 & 5	" "
Stanley, Nos. 35-50,	40 & 5	" "
20th Century,	40 & 5	" "

Easels, Printing Frames.

Net.

Enclosures.

Net.

Envelopes.

Napoleon,	Net.
Rice Bond,	" "
Surah Linen,	" "
Universal,	" "

Exposure Metres.

Expodak,	Net.
Watkin's,	10 per cent.
Wynne's,	10 " "

Fabric.

Orange,	15 per cent.
Ruby,	15 " "

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Fans.

Water Fans,	Net.
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Ferrotypes Plates.

Egg Shell,	Net.
Squeegee { Light,	20 per cent.
" { Heavy,	20 " "

Film Holders.

Ideal,	Net.
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Films.

Positive and Negative (Seed's),	15 per cent.
" " (Carbutt's),	15 " "
Roll,	Net.

Filter Paper.

	Net.
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Finger Tips.

Rubber,	Net.
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Fixing Boxes.

Fibre,	33 $\frac{1}{2}$ per cent.
Hard Rubber,	10 " "

Flanges.

	Net.
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Flash Light Powder.

Aluminum Flash Cartridges,	Net.
Aluminum Sun Flash,	" "
Blitz Pulver,	" "
Eastman Actino,	" "
" Flash Sheets,	" "
Lloyd's Compound,	10 per cent.
" Flash Cartridges,	10 " "
" Pure Magnesium,	10 " "
Luxo,	Net.
Scovill's Flash Cartridges,	10 per cent.
Sun Flash Cartridges,	10 " "
Sunlight,	10 " "

Focusing Glasses.

	Net.
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Frames.

Lloyd's Antique,	Net.
Leigh's Combination,	" "
Printing { Light,	40 per cent.
" { Heavy,	33 $\frac{1}{2}$ " "
Retouching,	10 " "
Transparency,	10 " "

Front Boards.

Same discount as Cameras.

Funnels.

	10 per cent.
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Glass.

Cover,	Net.
Forms,	" "
Funnels,	10 per cent.
Graduates,	10 " "
Green,	Net.
Ground,	" "
Orange,	" "
Plain,	" "
Ruby,	" "

Gloves.

Rubber,	Net.
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Graduates.

	10 per cent.
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Hardeners.

Kloro,	Net.
Solio,	" "

Head Rests.

	10 per cent.
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Head Screens.

	10 per cent.
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Holders, Plate.

Graphic Magazine,	Net.
Kodak,	{ Same discount
Poco,	{ as on Cameras.
Premo,	" "
Ray,	" "

Holders, Roll.

	Net.
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Hydrometers.

	Net.
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Iconoscopes.

	10 per cent.
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India Ink.

	10 per cent.
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Kits.

R. C. Co.'s, }	{ Same discount	
R. O. Co.'s, }		{ as Cameras.
Studio Set, }		

Kodaks.

	Net.
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Lamps, Dark-room.

Eastman,	20 per cent.
Ideal,	20 " "
Incandescent Ruby,	20 " "
Lloyd,	25 " "
" Metal Candle Lamps,	Net.
Multum-in-Parvo,	10 per cent.

Lens, Condensing.

	10 per cent.
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Lenses, Finder.

	10 per cent.
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Lenses.

B. & L. Alvan Clark,	20 per cent.
B. & L. Ex. Rapid Universal,	15 " "
B. & L. Rapid Universal,	20 " "
B. & L. Portrait,	10 " "
B. & L. Telephoto,	10 " "
Lloyd Special,	20 " "
Zeiss Anastigmat,	—

Levels.

Double Angle,	10 per cent.
Round,	20 " "

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Lifters, Plate.

Efficient,	10 per cent.
Haworth,	10 " "
L.,	10 " "
Russell,	10 " "

Litmus.

Lloyd's,	Net.
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Lloyd's Developers.

	10 per cent.
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Marl, Strauss.

	10 per cent.
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Mats, Etched.

For Transparencies,	Net.
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Mats, Lantern.

Boston,	10 per cent.
Gilt Line,	10 " "
Olmstead,	10 " "

Mounting Pads.

Carter's,	10 per cent.
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Mounting Paste.

Anti-cockle,	10 per cent.
Carter's,	10 " "
Higgins's,	10 " "
Kollos,	10 " "

Mounting Rollers.

Lloyd's Single,	Net.
" Double,	20 per cent.

Negative Boxes.

	10 per cent.
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Negative Preservers.

	10 per cent.
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Negative Racks.

	20 per cent.
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Opaque.

Gipon's,	10 per cent.
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Outfits.

Eastman,	Net.
Lloyd,	" "

Papers, Printing.

Albama,	Net.
Albumen,	" "
Aristo, Jr.,	" "
Aristo Platino,	" "
Bromide,	25 per cent.
Dekko,	10 " "
Delta Mat,	Net.
French Satin, Jr.,	10 per cent.
Kloro,	Net.
Opto,	10 per cent.
Plati,	10 " "
Platinum, Bradley,	Net.
Platinum, Willis & Clements,	10 per cent.
Solio,	Net.
Velox,	10 per cent.