



GOERZ  
LENSES



LP1387

# GOERZ LENSES

C. P. GOERZ AMERICAN  
OPTICAL CO.

NEW YORK, N. Y., 52 UNION SQUARE  
CHICAGO, ILL., HEYWORTH BUILDING

SAN FRANCISCO, CAL.

TELGMAAN & TORKA

GENERAL AGENTS FOR THE PACIFIC COAST  
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BERLIN LONDON PARIS ST. PETERSBURG

## To Our Readers

SINCE the first Anastigmat was put on the market by the firm of C. P. Goerz, fourteen years ago, over Two Hundred Thousand of these lenses have been manufactured and sold. And we speak here of the Anastigmats alone, which form but a branch of the business done by the Optische Anstalt, C. P. Goerz. The demand has constantly far exceeded the supply. Addition after addition was made to the main factory in Berlin. Branch factories were established at Winterstein, St. Petersburg, and New York. Concessions to manufacture the Goerz Patents were given to English manufacturers. Yet, withal, additional means again will have to be provided this year to meet the requirements of our customers and to decrease the congestion and pressure at the C. P. Goerz factories, taxed already to the utmost of their capacity.

It is but proper that we should thank here, publicly, all our friends who, in spite of our inability at times to deliver as promptly as we would have desired, have been willing to wait, preferring to secure our goods, even at the cost of some personal inconvenience, rather than to purchase the "just-as-good" product always to be found "ready for sale" on the spot.

Several new lines of goods will be put on the market during the season of 1908. We hope that they will receive at the hands of the photographic fraternity the same enthusiastic reception as greeted their elders. Meanwhile we shall continue to strain all our efforts toward securing for, and always preserving in our goods that high standard of quality which has built up the name of this firm and established its splendid business on a firm and durable foundation.



J. H. GARO, BOSTON

FIRST PRIZE IN GOERZ CUP COMPETITION FOR PROFESSIONAL PHOTOGRAPHERS, 1906

MADE WITH GOERZ DAGOR (SERIES III) No. 9

## On the Selection of Lenses

**W**HEN it is desired to use a photographic lens for more than one kind of work, the selection of the most suitable objective becomes a matter of careful thought. As to the so-called "all-around lenses," so much desired by the great majority of amateurs, only instruments of moderate rapidity come into consideration. This is due to the fact that lenses of a rapidity exceeding  $f:6.3$  cease to be useful for wide-angle views, even when worked with small diaphragm-openings.

The longer the focal length of a lens the more decided are its special characteristics. Consequently long-focus lenses lack adaptability to a variety of purposes—whatever their rapidity may be. Therefore a lens for all-around photographic work should not exceed 8 to 10 inches in focal length, which limits the size of the camera to a  $6\frac{1}{2} \times 8\frac{1}{2}$  outfit. Applying these considerations to actual practice we find that an outfit, suitable to fill the greatest possible number of uses, should preferably consist of a camera  $5 \times 7$  inches or  $6\frac{1}{2} \times 8\frac{1}{2}$  inches, with a Dagor, either of  $8\frac{1}{4}$  or  $9\frac{1}{2}$  inches focus. When long-range work is a factor of importance, it would be preferable to select a convertible Pantar of corresponding focal length, as the single members of these objectives are particularly suitable for long-range views. When the requirements go beyond the possibilities of such equipment, they are no longer to be considered as part of a variety of purposes, but lead to the use of special instruments.

The principal branches of special work are portraiture and commercial photography. By this last term we refer to the photography of machinery, furniture, glass, and silverware, etc. In portraiture great rapidity of the lens is, of course, an important point. We therefore select the fast Celor Lenses for this work. The covering power of these lenses is so considerable that it need no special consideration; but attention must be given to the choice of the most suitable focal length. The size of the portrait desired should be the only controlling factor in the selection of a portrait-lens, and practice has proven that the most pleasing results are obtained by the use of a lens the focus of which is twice the length of the largest bust which it is to make. For instance, on an  $8 \times 10$  plate one can properly make a bust measuring 7 inches from

the top of the head to the chest. A lens of  $2 \times 7$  inches—14 inches focus will do this at a comfortable distance, insuring good perspective. In short operating-rooms it is not always possible to follow the above rule, but wherever possible, it is very desirable to adhere to it. The degree of sharpness of definition is entirely in the control of the operator, and can be changed from the most critical sharpness to the softest diffusion.

For commercial work, the principal condition is a fine perspective effect. This can be secured by using a lens of great focal length, so that the camera can be set up at considerable distance from the object. Owing to the great depth of focus required in such a case, and therefore the compulsory use of small diaphragms, it is not desirable to employ extra-fast lenses for such work. The Dagor Lens is the most suitable, as it permits of a sufficiently large aperture for easy focusing and will produce the maximum possible depth of focus when stopped down to the smaller diaphragms.

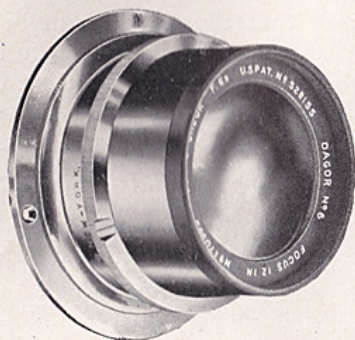
As it may be valuable to many photographers to know how they can determine the focal length allowable in operating-rooms of limited length, we will give here the simple rules which govern the relations between focal length, size of image, and distance of the subject. When speaking of "focal length" we always refer to the *principal* or *equivalent* focus, which is the distance from the optical center of the lens to the surface of the plate when the object is at very great distance. For all Goerz Lenses the optical center is situated in the plane of the diaphragm, and from that point the focus should be measured.

When making a picture  $n$  times smaller than the original, the object should be at a distance of  $(n+1) \times$  focus from the lens. If this distance is limited to  $D$  feet— $12D$  inches, on account of the available space, it will be clear that  $12D = (n+1)$  focus, or focus  $\frac{12D}{n+1}$  inches. To illustrate: What should be the proper focal length for making a standing full-length cabinet-portrait in a room 12 feet from wall to wall? This leaves, after allowing space for background and for length of camera and moving space for operator, a clear distance of 8 feet between lens and sitter, thus  $D=8 \times 12=96$  inches. A full-length cabinet-picture measures  $4\frac{3}{4}$  inches from head to feet. Now, assuming the person to be 5 feet 10 inches tall,  $n=\frac{70}{4.75}$ —say 14.5; we can now write  $f=\frac{12D}{n+1}=\frac{96}{15.5}=6.18$  or, say, 6 inches.

## Goerz Dagor

*F: 6.8 (Series III)*

Universal Extra-rapid Lens for Landscapes, Architecture, Portraits, Groups, Instantaneous Photography, Interiors, and Scientific Work of All Kinds

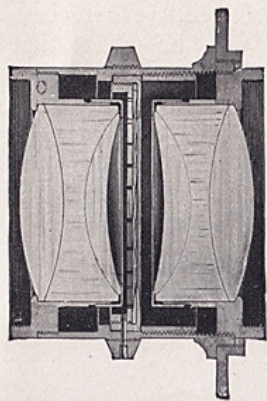


**A**LTHOUGH it is but a few years since public attention was first attracted to the Goerz Double Anastigmat Dagor (Series III), these lenses have won the most extended recognition, not only from authorities in photographic optics who have been in position to exhaustively test their merits, but from the photographic confraternity at large, whether amateur or professional.

The Dagor Lens is a universal instrument in the full sense of the word, and comes as near being an all-around lens as can be hoped for, considering the manifold and complex requirements of the photographic craftsman.

*Each Goerz Double Anastigmat Dagor supplies*

1. *A Rapid Lens* for general purposes—Portraiture, Landscape, Architecture, Enlargements, etc., working at



*full aperture* with extreme sharpness to the edges of the plate for which it is constructed.

2. *A Wide-angle Lens* for Interiors and all views at short distances, sharply covering a much larger plate when smaller apertures are employed.

3. *A Long-focus Lens* for distant objects, when the back combination alone is used.

### *Characteristics of Dagor Lenses*

The *astigmatism* is completely corrected, with the result that, even at full aperture, the image is as sharp at the edge as it is in the center.

The *curvature of the field* is eliminated within an angle of  $72^\circ$ —*i. e.*, that part of the image which is comprised within that angle is absolutely flat. The *definition* and *depth* are the same in all parts of the field.

The coëxistence of these two essential qualities, perfect anastigmatism and flatness of the field, gives these lenses supremacy over all other existing types.

They are, besides, spherically and chromatically corrected for the *axial* and *oblique* pencils, even with the largest stop.

By reason of the symmetrical arrangement of the two combinations of the Dagor Lens, the image is perfectly *orthoscopic*, and all traces of distortion are obviated, *a priori*.

The Dagor Lens is free from internal reflections, and the image produced is accordingly *brilliant* and *free from flare*.

The two combinations are placed in close proximity, consequently there is no falling off of the luminosity toward the edge, and the entire surface of the image is therefore uniformly illuminated. The compactness of the Dagor Lens renders it extremely rigid and portable.

The glasses employed in the construction of the three elements are so chosen as to reduce the secondary chromatic aberration to an inappreciable minimum. Apochromatic correction is therefore well-nigh perfect.

As a result of the symmetrical arrangement of the two combinations of the lens, either may be used as a single landscape-lens, the focus of which is about double that of the entire combination.

The Goerz Dagor

| No.    | Equivalent Focus Inches | Free Aperture Inches | Size of Plate Sharply Covered at |                               |                               | Code-word     | Price, with Iris Diaphragm |          |
|--------|-------------------------|----------------------|----------------------------------|-------------------------------|-------------------------------|---------------|----------------------------|----------|
|        |                         |                      | F : 6.8<br>U.S. : 2.9<br>Inches  | F : 16<br>U.S. : 16<br>Inches | F : 32<br>U.S. : 64<br>Inches |               |                            |          |
| F: 6.8 | 0000                    | 1 5/8                | 1 5/8 x 1 5/8                    | 2 x 2                         | 2 x 2 3/4                     | Capo          | \$34.00                    |          |
|        | 000                     | 2 3/8                | 3/8                              | 2 3/8 x 2 3/8                 | 2 1/2 x 3                     | 2 3/4 x 3 1/2 | Cardiff                    | 34.00    |
|        | 00                      | 3 1/2                | 1/2                              | 3 x 3                         | 3 1/4 x 4 1/4                 | 4 x 5         | Cadiz                      | 35.50    |
|        | 0                       | 5                    | 3/4                              | 3 1/4 x 4 1/4                 | 4 x 5                         | 5 x 7         | Cæsar                      | 37.50    |
|        | 1                       | 6                    | 7/8                              | 4 x 5                         | 5 x 7                         | 6 1/2 x 8 1/2 | Calderon                   | 45.00*   |
|        | 2                       | 7                    | 1                                | 5 x 7                         | 5 x 8                         | 8 x 10        | Calla                      | 51.50    |
|        | 3                       | 8 1/4                | 1 1/4                            | 5 x 8                         | 6 1/2 x 8 1/2                 | 10 x 12       | Calvin                     | 62.50    |
|        | 4                       | 9 1/2                | 1 5/16                           | 6 1/2 x 8 1/2                 | 7 x 9                         | 11 x 14       | Cameron                    | 75.50    |
|        | 5                       | 10 3/4               | 1 1/2                            | 7 x 9                         | 8 x 10                        | 12 x 16       | Camillus                   | 91.00    |
|        | 6                       | 12                   | 1 5/8                            | 8 x 10                        | 10 x 12                       | 16 x 18       | Canada                     | 107.00   |
|        | 7                       | 14                   | 2                                | 10 x 12                       | 12 x 15                       | 18 x 22       | Capet                      | 140.00   |
| F: 7.1 | 7a                      | 16 1/2               | 2 3/8                            | 11 x 14                       | 13 x 17                       | 20 x 24       | Caviar                     | 182.00   |
|        | 8                       | 19                   | 2 5/8                            | 12 x 15                       | 16 x 18                       | 22 x 25       | Carlos                     | 219.00   |
|        | 9                       | 24                   | 3 5/16                           | 16 x 18                       | 18 x 22                       | 24 x 30       | Census                     | 325.00   |
|        | 10                      | 30                   | 4 1/4                            | 18 x 22                       | 22 x 25                       | 30 x 36       | City                       | 539.00   |
|        | 11                      | 35                   | 5                                | 22 x 25                       | 24 x 30                       | 34 x 44       | Columbia                   | 1,070.00 |

\*For 3A Folding Pocket Kodaks we provide a Dagor of 6 1/2-inch focus of same series in place of our regular No. 1.

For stereoscopic views the lenses are "paired" at an extra charge of \$2.50.

### The Goerz Dagor (Series III) as a Wide-angle Lens

The exceptionally fine correction of the Goerz Dagor Lenses over their entire light-circle allows us to use them with the most perfect results as wide-angle lenses up to an angle of 90°. They will give critical definition over the whole image subtended by this angle when stopped down to U.S.:16 (-F:16) or smaller. Their considerable luminosity at full aperture facilitates focusing materially, for which reason alone this type of objective is greatly preferable to the ordinary W. A. lenses. Furthermore, the angle they include is equal to that provided by most wide-angle lenses stated to give 100° or 110°, and they are free from distortion. Though it be true that some lenses have a light-circle of this extent, they do not utilize it on the plate, being not sufficiently corrected to make their full angle available. An actual image-angle of 60° to 65° is usually the maximum they produce. The foregoing list of Dagor Lenses will enable any one to make a proper selection to suit any requirement.



W. H. WALLACE, NEW YORK

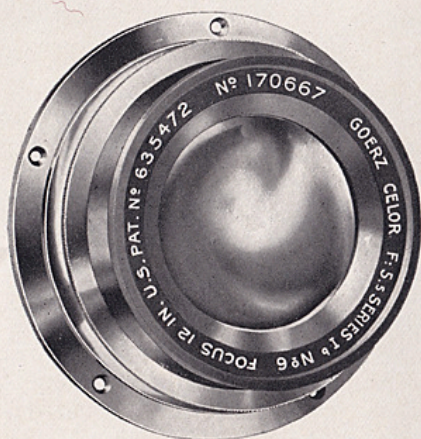
MADE WITH GOERZ DAGOR No. 2 (5x7) ON 8x10 PLATE

## Goerz Celor

*F: 4.5-F: 5.5 (Series IB)*

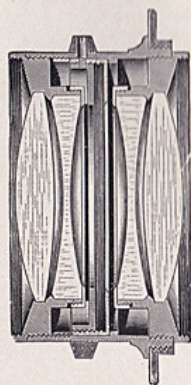
Extra rapid, Apochromatic

Special Objective for Fastest Instantaneous Exposures, Portraits in Room and Studio; Enlargements and Reproductions; Three-color Process; Tele-photography; Projections. Also for Landscapes and Architectural Views, and for all purposes requiring extreme speed.



THERE are in the market several Anastigmat Lenses working at a great relative aperture. Theoretically, their speed leaves nothing to be desired. But when they are used at their full aperture the extent of the field sharply covered is not sufficient to allow one to make practical use of their speed.

To overcome this difficulty the focal length of these Lenses is generally increased, which accentuates all the more the lack of "depth-of-focus," already very noticeable because of their large relative aperture. Consequently a fast lens, to be really serviceable



for general photographic work, should not only possess speed, but should at the same time cut sharply at full aperture an image contained within an angle of  $60^\circ$ , or, in other words, a plate the longer side of which is about equal to the focal length of the lens.

Our Celor Lens combines these properties. It has its place therefore in all up-to-date studios.

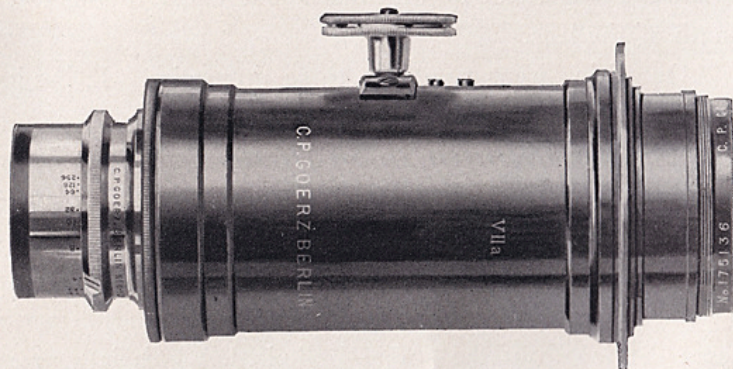
We claim that Celor Lenses are superior to all other Anastigmats of equal maximum aperture because of their larger field of sharp definition at full aperture. This enables one to select a Celor Lens of shorter focal length than that of other similar Anastigmats, an important consideration where the length of the studio is limited. This is a great advantage for the photographer, meaning, as it does, a gain in the depth of focus and incidentally in actual working speed.

The back combination of the Celor can be used as a single lens of double the focal length. At F.32 it will yield about the same definition as the whole lens and twice the covering power of the latter.

### *The Goerz Celor*

| No. | Equivalent Focus Inches | Relative Opening | Diameter of Lenses Inches | Size of Plate       |                          | Code-word | Price, with Iris Diaphragm |
|-----|-------------------------|------------------|---------------------------|---------------------|--------------------------|-----------|----------------------------|
|     |                         |                  |                           | Full Opening Inches | F. : 16 U.S. : 16 Inches |           |                            |
| 000 | 2 3/8                   | F 4.5            | 9/16                      | 1 1/2 x 2 1/2       | 2 x 2 1/2                | Baal      | \$34.50                    |
| 00  | 3 1/2                   | F 4.8            | 25/32                     | 2 1/2 x 3 1/2       | 3 x 4                    | Babel     | 38.00                      |
| 0   | 4 3/4                   | F 4.8            | 1 1/32                    | 3 1/4 x 4 1/4       | 4 x 5                    | Bacca     | 40.00                      |
| 1   | 6                       | F 4.8            | 1 1/4                     | 4 x 5               | 5 x 7                    | Babuin    | 47.00                      |
| 2   | 7                       | F 4.8            | 1 1/2                     | 5 x 7               | 5 x 8                    | Bacchus   | 54.50                      |
| 3   | 8 1/4                   | F 5.             | 1 3/4                     | 5 x 8               | 6 1/2 x 8 1/2            | Baco      | 67.00                      |
| 4   | 9 1/2                   | F 5.             | 1 31/32                   | 6 1/2 x 8 1/2       | 7 x 9                    | Bairam    | 90.50                      |
| 5   | 10 3/4                  | F 5.             | 2 1/16                    | 7 x 9               | 8 x 10                   | Bagdad    | 108.50                     |
| 6   | 12                      | F 5.5            | 2 1/4                     | 8 x 10              | 10 x 12                  | Bagger    | 126.50                     |
| 7   | 14                      | F 5.5            | 2 21/32                   | 10 x 12             | 12 x 15                  | Bagno     | 163.00                     |
| 7a  | 16 1/2                  | F 5.5            | 3 3/32                    | 11 x 14             | 13 x 17                  | Bacillus  | 208.50                     |
| 8   | 19                      | F 5.5            | 3 19/32                   | 12 x 15             | 16 x 18                  | Bakul     | 245.00                     |

## Goerz Telephoto Lenses and Telephoto Mounts



**T**HE size of the photographic image of an object depends:

1. On the size of the object.
2. On its distance from the lens.
3. On the focal length of the lens employed.

The size of the object to be photographed is unalterable; if, however, it is wished to take different-sized pictures of it with one and the same positive lens, then the object must be photographed at different distances.

If the distance from an object is constant, then pictures of different sizes of this object can only be taken by employing lenses of different focal lengths.

The size, weight, and price of a complete photographic outfit increase proportionately with the length of focus of the lens, so that the limit is soon reached beyond which the focal length can not conveniently be extended. This difficulty is readily overcome by the use of a Telephoto Lens. It is then no longer necessary to alter the position of the camera, nor to use lenses of different focal lengths, to obtain pictures of different sizes of the same object from the same standpoint.

A Telephoto Lens is a photographic telescope. In the same manner in which a telescope helps the human eye to see

distant objects larger and clearer, so is an additional negative lens applied to a photographic lens to take pictures on a more or less enlarged scale.

Every possessor of a good photographic lens can convert it, by the addition of a Telenegative with Teletube, into a Telephoto Lens, the positive lens being unaltered, and still available for ordinary use.

Telephoto Lenses are lighter, more convenient, and less costly than positive lenses of correspondingly long focus; they give pictures of almost the same sharpness and clearness as ordinary lenses, but cover a smaller angle, and have less rapidity, the speed decreasing in inverse ratio to the magnification.

On the other hand, by using the Telephoto Lens, pictures which require a long-focus lens can be taken with small cameras with short bellows; an advantage unobtainable by any other method.

With a Telephoto Attachment, therefore, we obtain the advantages of a lens of long-equivalent focus without the need of a corresponding increase of bellows extension. As will be seen later this equivalent focus, and therefore the magnification, can be varied. By the use of the Telephoto Lens, objects situated at a remote distance or, from their position, inaccessible to the photographer with his ordinary outfit, can be faithfully recorded without difficulty. With it can be photographed the capitals of columns, tracery, carving, or inscriptions, for which the camera without the attachment would be useless. The landscape-worker, without moving his camera, can determine the amount of subject he will include upon his plate, can take mountain ranges, inaccessible peaks, and many a gem of scenery, which from the nature of its surroundings, can only be taken from a distance. The naturalist, perhaps, is even more indebted to the Telephoto Lens, for by its means large pictures of the most timid animals can be taken. Not only is the Telephoto Lens of value for distant objects, but it is equally useful for subjects near at hand, as it is only by use of Telephoto Lenses that objects can be reproduced in



anything like natural size with due regard to their proportions, and without distortion or exaggerated perspective.

Another important point may be mentioned in this place. If we have to reproduce an object in full-size, we measure, of course, our image on the screen, and compare its size with the original. If we measure the image given by the positive lens on the screen, we find that only the parts lying in a certain plane are correct, those lying in other planes being either larger or smaller than the original. In the image taken with the Tele-lens we can compare the size of any part of the image with the original, which not only facilitates the working considerably, but insures a reproduction of exactly the same dimensions.

These considerations apply very strikingly to portraiture, and there is no doubt that portraits made with Telephoto Lenses are wonderfully lifelike, and impress us as much more truthful than those made by means of positive lenses, even of very great focal length.

*Table of Bellows Extensions required for the different Magnifications with Negative Lenses of various Focal Lengths*

| *Exposure Number                     | Magnification | Negative Lens 1 $\frac{1}{16}$ | Negative Lens 1 $\frac{1}{8}$ | Negative Lens 2 $\frac{1}{8}$ | Negative Lens 3    | Negative Lens 3 $\frac{1}{2}$ | Negative Lens 4 $\frac{1}{4}$ | Negative Lens 6      |
|--------------------------------------|---------------|--------------------------------|-------------------------------|-------------------------------|--------------------|-------------------------------|-------------------------------|----------------------|
| <i>Required Extension of Bellows</i> |               |                                |                               |                               |                    |                               |                               |                      |
| 9                                    | 3             | 2 $\frac{1}{2}$ in.            | 3 $\frac{1}{4}$ in.           | 4 $\frac{3}{4}$ in.           | 6 in.              | 7 in.                         | 9 $\frac{1}{2}$ in.           | 11 $\frac{3}{4}$ in. |
| 16                                   | 4             | 3 $\frac{1}{2}$ "              | 4 $\frac{3}{4}$ "             | 7 "                           | 8 $\frac{3}{4}$ "  | 10 $\frac{3}{4}$ "            | 14 $\frac{1}{4}$ "            | 17 $\frac{3}{4}$ "   |
| 25                                   | 5             | 4 $\frac{3}{4}$ "              | 6 $\frac{1}{4}$ "             | 9 $\frac{1}{2}$ "             | 11 $\frac{3}{4}$ " | 14 $\frac{1}{4}$ "            | 19 "                          | 23 $\frac{1}{2}$ "   |
| 36                                   | 6             | 6 "                            | 7 $\frac{3}{4}$ "             | 11 $\frac{3}{4}$ "            | 14 $\frac{3}{4}$ " | 17 $\frac{3}{4}$ "            | 23 $\frac{1}{2}$ "            | 29 $\frac{1}{2}$ "   |
| 49                                   | 7             | 7 "                            | 9 $\frac{3}{4}$ "             | 14 $\frac{1}{4}$ "            | 18 "               | 21 "                          | 28 $\frac{1}{2}$ "            | 36 "                 |
| 64                                   | 8             | 8 $\frac{1}{4}$ "              | 11 "                          | 16 $\frac{1}{2}$ "            | 20 $\frac{3}{4}$ " | 24 $\frac{3}{4}$ "            | 33 "                          | 41 $\frac{1}{4}$ "   |
| 81                                   | 9             | 9 $\frac{1}{2}$ "              | 12 $\frac{3}{4}$ "            | 19 "                          | 23 $\frac{1}{2}$ " | 28 $\frac{1}{4}$ "            | 37 $\frac{3}{4}$ "            | 47 "                 |
| 100                                  | 10            | 10 $\frac{3}{4}$ "             | 14 $\frac{1}{4}$ "            | 21 $\frac{1}{4}$ "            | 26 $\frac{1}{2}$ " | 31 $\frac{3}{4}$ "            | 42 $\frac{1}{2}$ "            | 52 "                 |

\*This number multiplied by the time of exposure which would be required with the positive lens alone at the same aperture will give the exposure required for the tele-picture.

Our Telephoto Mounts and Lenses are especially recommended in combination with our well-known Double Anastigmats Dagor and Celor.

The lens cells and tubes are entirely of aluminum, consequently very light, and at the same time perfectly rigid, insuring thereby a most accurate centering of the lens-systems.

*Price-list of Goerz Tele-negative Lenses in cells only*

| No. | Focal Length inches | Diameter of Thread | Price   | No. | Focal Length inches | Diameter of Thread | Price   |
|-----|---------------------|--------------------|---------|-----|---------------------|--------------------|---------|
| 1   | 1 $\frac{3}{16}$    | 0 $\frac{1}{16}$   | \$11.00 | 5   | 3 $\frac{3}{16}$    | 2 $\frac{1}{16}$   | \$27.00 |
| 2   | 1 $\frac{7}{16}$    | 1 $\frac{1}{16}$   | 12.50   | 6   | 4 $\frac{1}{2}$     | 2 $\frac{1}{16}$   | 40.00   |
| 3   | 2 $\frac{1}{16}$    | 1 $\frac{1}{8}$    | 16.50   | 7   | 5 $\frac{1}{16}$    | 3 $\frac{1}{16}$   | 54.50   |
| 4   | 2 $\frac{1}{2}$     | 1 $\frac{1}{4}$    | 22.00   |     |                     |                    |         |

### Tele-objectives for the Goerz-Anschütz Cameras

The extreme rigidity of the Goerz-Anschütz Camera makes it an excellent instrument for the application of our tele-photographic lenses. We have therefore constructed on special designs a set of tubes which permit to obtain magnifications ranging between 3 and 6 diameters. It should be well understood, however, that as these cameras have a fixed extension, only one degree of magnification is obtainable with each camera, unless one makes use of the extension-piece with which these cameras can be equipped. In that case two different degrees of magnification may be had. The annexed tables give full particulars for each size of camera. The focusing adjustment of the lens-mount remains equally serviceable to focus the tele-objective for variously distanced objects as in its ordinary use.

| Size of Goerz-Anschütz Camera     | Focal Length of Regular Goerz Lens         | Focus of Negative Lens inches | When Used without Extension |                                   |                                   | When Used with Extension |                                    |                                   | Price of complete Negative Lens and Tube including Cost of Fitting to Lens and Camera |
|-----------------------------------|--|-------------------------------|-----------------------------|-----------------------------------|-----------------------------------|--------------------------|------------------------------------|-----------------------------------|---|
|                                   |  |                               | Magnification               | Size of Image                     | Sharply Covered Image             | Magnification            | Size of Image                      | Sharply Covered Image             |   |
|                                   |  |                               |                             |                                   |                                   |                          |                                    |                                   |   |
| 3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ | { Dagor No. 0<br>Focus 4 $\frac{3}{4}$ in. | 2 $\frac{3}{8}$               | 3 x                         | 3 $\frac{1}{2}$ x 4 $\frac{3}{4}$ | 3 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 5 x                      | 6 $\frac{1}{2}$ x 8 $\frac{1}{2}$  | 4 $\frac{3}{4}$ x 6 $\frac{1}{2}$ | \$25.50   |
| 3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ | { Celor No. 0<br>Focus 4 $\frac{3}{4}$ in. | 2 $\frac{3}{8}$               | 3 x                         | 3 $\frac{1}{2}$ x 4 $\frac{3}{4}$ | 3 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 5 x                      | 6 $\frac{1}{2}$ x 8 $\frac{1}{2}$  | 4 $\frac{3}{4}$ x 6 $\frac{1}{2}$ | 26.50   |
| 4 x 5                             | { Dagor No. 1<br>Focus 6 in.               | 2 $\frac{3}{8}$               | 3 $\frac{1}{2}$ x           | 4 x 5                             | 3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ | 6 x                      | 7 x 9 $\frac{1}{2}$                | 4 $\frac{3}{4}$ x 6 $\frac{1}{2}$ | 26.50   |
| 4 x 5                             | { Celor No. 1<br>Focus 6 in.               | 2 $\frac{3}{8}$               | 3 $\frac{1}{2}$ x           | 4 x 5                             | 3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ | 6 x                      | 7 x 9 $\frac{1}{2}$                | 4 $\frac{3}{4}$ x 6 $\frac{1}{2}$ | 29.00   |
| 5 x 7                             | { Dagor No. 2<br>Focus 7 in.               | 2 $\frac{1}{2}$               | 3 $\frac{3}{8}$ x           | 4 $\frac{3}{4}$ x 6 $\frac{1}{2}$ | 3 $\frac{1}{2}$ x 4 $\frac{3}{4}$ | 5 $\frac{1}{8}$ x        | 8 $\frac{1}{4}$ x 10 $\frac{5}{8}$ | 5 x 7                             | 36.50   |
| 5 x 7                             | { Celor No. 2<br>Focus 7 in.               | 2 $\frac{1}{2}$               | 3 $\frac{3}{8}$ x           | 4 $\frac{3}{4}$ x 6 $\frac{1}{2}$ | 3 $\frac{1}{2}$ x 4 $\frac{3}{4}$ | 5 $\frac{1}{8}$ x        | 8 $\frac{1}{4}$ x 10 $\frac{5}{8}$ | 5 x 7                             | 38.50   |

These tele-attachments can also be fitted to other cameras of the same type of construction. Prices will be quoted on request.

## Goerz Tele-negative Lenses and Tubes

For Hand and View Cameras  
with Extending Bellows

**T**HIS table contains a few of the most useful combinations of Dagor and Celor lenses with our tele-negative lenses. As, however, a number of other combinations can be made to work quite successfully, we shall be pleased to give, on request, full information on any special requirements which may require a different combination of lens-systems.

### Some Selected Telephoto Combinations

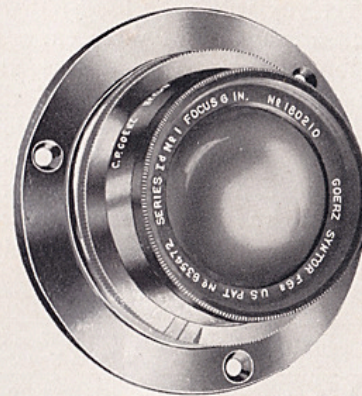
| Focus of             |                      | Magnification |     | Bellows Extension for |                      | Size of Plate covered with  |                              | Price of Negative Lens and Tube to fit |           |    |         |
|----------------------|----------------------|---------------|-----|-----------------------|----------------------|-----------------------------|------------------------------|--|-----------|----|---------|
| Positive Lens inches | Negative Lens inches | From          | To  | Lowest Power inches   | Highest Power inches | Lowest Magnification inches | Highest Magnification inches | Dagor No.                              | Celor No. |    |         |
| 3½                   | 1½                   | 3 x           | 8 x | 3½                    | 11                   | 2¾ x 3¼                     | 6½ x 8½                      | 00                                     | \$29.00   | 00 | \$29.00 |
| 4¾                   | 2¾                   | 3 x           | 8 x | 4¾                    | 16½                  | 3½ x 4¾                     | 10 x 12                      | 0                                      | 33.50     | 0  | 33.50   |
| 6                    | 2¾                   | 3 x           | 8 x | 4¾                    | 16½                  | 3½ x 4¾                     | 10 x 12                      | 1                                      | 33.50     | 1  | 34.50   |
| 6                    | 3                    | 3 x           | 8 x | 6                     | 20¾                  | 4 x 5                       | 12 x 16                      | 1                                      | 42.00     | 1  | 42.00   |
| 7                    | 2¾                   | 3 x           | 8 x | 4¾                    | 16½                  | 3½ x 4¾                     | 10 x 12                      | 2                                      | 36.50     | 2  | 38.50   |
| 7                    | 3                    | 3 x           | 8 x | 6                     | 20¾                  | 4 x 5                       | 12 x 16                      | 2                                      | 43.50     | 2  | 44.00   |
| 8¼                   | 3                    | 3 x           | 9 x | 6                     | 23½                  | 4 x 5                       | 12 x 16                      | 3                                      | 45.50     | 3  | 45.50   |
| 8¼                   | 3½                   | 3 x           | 8 x | 7                     | 25                   | 5 x 7                       | 12 x 16                      | 3                                      | 52.50     | 3  | 52.50   |
| 9½                   | 3½                   | 3 x           | 9 x | 7                     | 28½                  | 4¾ x 6½                     | 16 x 20                      | 4                                      | 52.50     | 4  | 52.50   |
| 10¾                  | 3½                   | 3 x           | 9 x | 7                     | 28½                  | 4¾ x 6½                     | 16 x 20                      | 5                                      | 56.50     | 5  | 58.00   |
| 10¾                  | 4¾                   | 3 x           | 7 x | 9½                    | 28½                  | 7 x 9                       | 20 x 24                      | 5                                      | 71.00     | 5  | 71.00   |
| 12                   | 4¾                   | 3 x           | 8 x | 9½                    | 33                   | 7 x 9                       | 20 x 24                      | 6                                      | 72.50     | 6  | 72.50   |
| 14                   | 6                    | 3 x           | 7 x | 12                    | 35½                  | 9 x 12                      | 24 x 28                      | 7                                      | 94.00     | 7  | 94.00   |

The above prices include the cost of fitting these combinations to the different Dagor and Celor lenses, but do not include the cost of these lenses.

## Goerz Syntor

F: 6.8

An Inexpensive Lens for Hand-cameras



**T**HIS series of Double Anastigmats is particularly intended for use on hand-cameras, and is made only up to the No. 6 size (12 inches focal length).

Designed on the same lines as the Celor, the Syntor Lenses are perfectly corrected for spherical chromatic and astigmatic aberrations. As they work at a smaller relative aperture, the single combinations can be brought very close together, insuring thereby a most even light-distribution over the whole plate.

Even at full aperture they are entirely free from coma and central spherical aberration.

The angle of sharp definition with the largest stop is 64°, increasing to 70° with smaller apertures.

Each combination of the Syntor Lens can be used singly with a medium or small stop as a valuable landscape- or portrait-lens of approximately double the focal length of the complete objective.

| No. | Equivalent Focus | Plate Cut Sharp at F: 6.8 | Price, with Iris Diaphragm | No. | Equivalent Focus | Plate Cut Sharp at F: 6.8 | Price, with Iris Diaphragm |
|-----|------------------|---------------------------|----------------------------|-----|------------------|---------------------------|----------------------------|
| 0   | 4¾ in.           | 3¼ x 4¼ in.               | \$23.50                    | 3   | 8¼ in.           | 5 x 8 in.                 | \$45.50                    |
| 1   | 6 in.            | 4 x 5 in.                 | 27.00                      | 4   | 9½ in.           | 6½ x 8½ in.               | 54.50                      |
| 2   | 7 in.            | 5 x 7 in.                 | 32.50                      | 6   | 12 in.           | 8 x 10 in.                | 72.50                      |

## The Goerz Ray-Screens

Warranted Optically True and Made From Colored Plane Optical Glass

THESE screens will fill a long-felt want for a really true and satisfactory Ray-screen. They are made from absolutely plane optical glass and do not interfere in any way with the corrections of the photographic lens with which they are used. They are made to fit all Goerz Lenses and can be fitted also to any other lens to order.

They can be obtained in three degrees of density—light, medium, and dark—increasing the exposure with isochromatic plates, five, ten, and twenty times respectively.

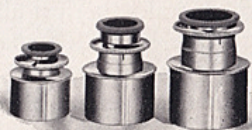
### Price-list

| For Goerz                  | Number  | Set in Three Colors in Neat Case | Single Screens each |
|----------------------------|---------|----------------------------------|---------------------|
| Dagor Lens (Series 3) . .  | 0 1 2 3 | \$3.00                           | \$1.00              |
| Dagor Lens (Series 3) . .  | 4 5 6   | 4.50                             | 1.50                |
| Dagor Lens (Series 3) . .  | 7 7a    | 6.00                             | 2.00                |
| Celor Lens (Series B) . .  | 0       | 3.00                             | 1.00                |
| Celor Lens (Series B) . .  | 1 2 3   | 4.50                             | 1.50                |
| Celor Lens (Series B) . .  | 4 5 6 7 | 6.00                             | 2.00                |
| Syntor Lens (Series D) . . | 0 1 2   | 3.00                             | 1.00                |
| Syntor Lens (Series D) . . | 3 4 6   | 4.50                             | 1.50                |

NOTE.—When ordering the Goerz Ray-filters for lenses of other manufacture the front combination of the lens to be fitted must be sent to us.

## Goerz Focusing-Glasses

*Series A.* These splendid magnifying-glasses are composed of three lens-segments—crown and flint cemented together. They are strictly aplanatic, *i. e.*, free from spherical as well as from chromatic aberration, and yield wonderfully brilliant images.



| No. | Equivalent Focus | Magnification | Price  |
|-----|------------------|---------------|--------|
| 1   | 1 3/16           | 8x            | \$5.50 |
| 2   | 1 1/16           | 6x            | 6.50   |
| 3   | 2 3/8            | 4x            | 8.75   |

*Series B.* This inexpensive model is an excellent glass when perfect aplanation is not required. It is composed of two lens-segments, divided by an air-space. Magnification, 6 diameters. Price, \$2.25.



R. F. SMITH, MONTREAL



PROTZ, JERSEY CITY



R. F. SMITH, MONTREAL

MADE WITH GOERZ-ANSCHÜTZ CAMERA AND CELOR LENS

SPEED ABOUT 1/800 OF A SECOND

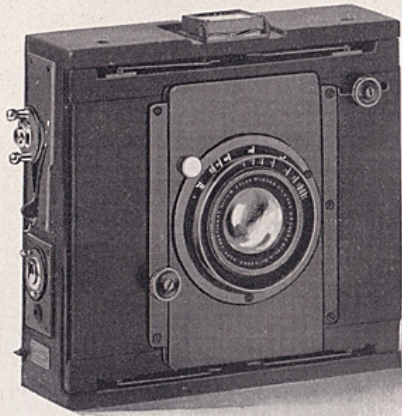
## The Goerz-Anschütz Folding-camera

*New Model*

Is the most efficient of all cameras for both experts and amateurs. Fitted with safety Focal-plane Shutter with outside slit adjustment giving automatic exposures from 5 seconds to 1/1000th second; also time- and bulb-exposures

### Description

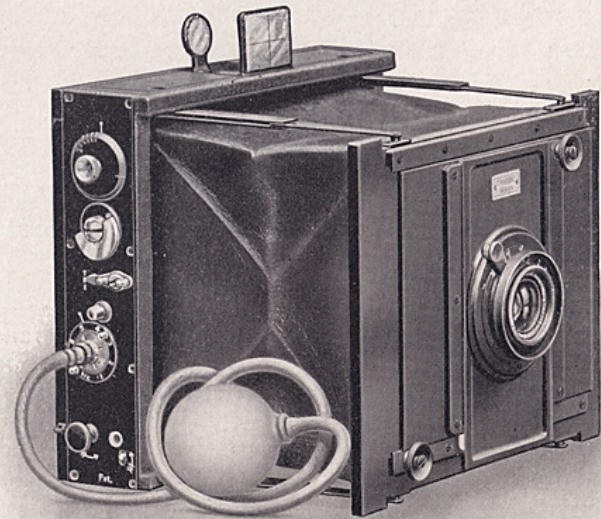
**T**HE Goerz-Anschütz Folding-camera is a small, elegant hand-camera which is available both for instantaneous and time exposures. This camera is extremely compact and light, the  $3\frac{1}{4} \times 4\frac{1}{4}$  weighing only 27 ounces, the  $4 \times 5$  model 39 ounces complete. It is of beautiful black ebony finish and unsurpassed workmanship. With its metallic parts oxidized in black, it is very inconspicuous; just the thing for this style of apparatus. The camera is opened for use by simply pulling the front out until the stays catch. Then the camera is as rigid as a solid box, the front remaining always perfectly parallel with the focal plane—a point of the greatest importance when lenses of large aperture are employed. The rapidity with which the camera is made ready and its unobtrusive appearance are two indispensable conditions for hand-camera work, and in both respects the Goerz-Anschütz Folding-camera is the finest



camera in the market. Especially do we recommend this camera to all photographers who make enlargements or lantern-slides. The perfect rigidity of its front board is a priceless feature, as it alone will insure that perfect plane parallelism of lens and plate or film surface which is indispensable for that class of work. Fitted with a Dagor or Celor Lens, the image-sharpness is so great that enlargements of 10 or 12 diameters (144 times in surface) are often mistaken for originals. No other folding hand-camera can boast of such rigid construction.

The front board is adjustable, both vertically and horizontally, in order to enable the operator to regulate the field of view from any given standpoint. More especially a "rise" of the front is employed in order to limit the foreground or bring any tall objects (a high building, for example) upon the plate.

While the camera is a fixed-focus instrument of admirable definition for general use, our lenses are fitted in a special focusing



mount which, by increasing the distance between lens and plate by means of a lever, permits the focusing of objects down to a distance of six feet. This mount is supplied with a focusing-scale easily read from the position of the lever, in addition to which each camera has a removable ground-glass back with extendable focusing-hood, which can be used for focusing before each exposure, whether one is using plates, film-pack, or roll-films.

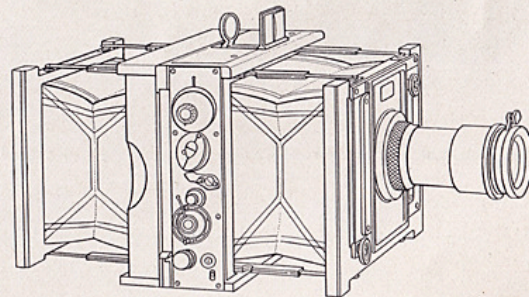
Another advantage: The Goerz-Anschütz can be focused at the level of the eye. It takes the pictures *as we see them*, which no camera does which focuses at the height of the chest.

The most important feature of the Goerz-Anschütz Folding-camera lies in the ingenious construction of the instantaneous shutter which has recently been considerably improved. This new focal-plane shutter will not only give all the speed suitable for very rapid work—from  $\frac{1}{10}$  to  $\frac{1}{1000}$  of a second—but time- and bulb-exposures as well, and all slow automatic speeds from  $\frac{1}{10}$  to 5 seconds. It is the most perfect style of safety focal-plane shutter made. The width of the slit is adjusted from the outside, and *the slot of the shutter is automatically closed* when the shutter is being set. This is a unique and invaluable advantage, especially when roll-films, film-pack, or magazine plate-holder are used, as the sensitive surface is always and absolutely protected from the light. The lens may remain uncapped at all times, and be ready for immediate action.

It is without doubt the most perfect and most complete shutter on the market, and permits not only a wider range of speeds, but a surer *adjustment* of the exposure than is obtainable with any other construction. Another valuable feature of the Anschütz Shutter is that with it the full lighting power of the lens is available, while shutters placed close to the objective give considerably less efficiency.

The range of usefulness of the Goerz-Anschütz Cameras is still considerably enlarged by the use of the "extension"

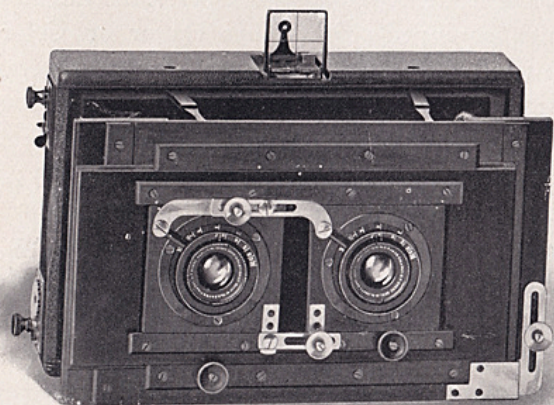
back which is shown in the annexed cut. It is a very light and compact device. It provides the means of converting the camera into a perfect long-focus apparatus as rigid as a box-camera. It answers beside the double purpose of rendering the single combination of the Dagor lenses available and of giving magnifications varying between 5 and 6 diameters when using on the camera our special Goerz-Anschütz telephoto attachments equipped with either Dagor or Celor lenses. (See page 15.) The absolute rigidity of these cameras, either with or without the extension, insures perfect success with telephoto lenses. The least deficiency in that respect would render any camera useless for telephoto-photography; but this need not be feared with the Goerz-Anschütz. The traveler in search of the beauties of architectural detail, or the student of natural history and animal life, will appreciate these features to their fullest extent.



The extension back is inserted in the grooves provided for the plate-holder of the main camera-body and carries in its guard the film-pack adapter, magazine, roll-holder or plate-holder in just the same manner as they are held by the camera without the extension. Reproduction in natural size, or direct photographs in life size can be made by means of the extension back, when using the complete positive lens alone. The telephoto attachments are also provided with a device by which they can be used for life-size photography at a considerable distance from the object.

# The Goerz-Anschütz Folding-camera

Stereoscopic Form



The Goerz-Anschütz Stereoscopic Camera (for plates  $3\frac{1}{2} \times 7$ ) adapted for Panoramic Photography

THE Goerz-Anschütz Folding-camera is also supplied adapted for *stereoscopic photography*. This model is provided with an adjustment by which the separation of the lenses can be varied, a point of the greatest importance in practical work. The stereoscopic division can also be removed, and one of the lenses brought facing the center of the plate. By this means the camera is rendered available for extensive panoramic views. For this latter purpose it is recommended that the camera be fitted with the Dagors (Series III), as these lenses have greater covering power than the Celors (Series IB). If fitted with the latter lenses the panoramic adjustment is not supplied. The Celor Lenses are set at a fixed separation.

## Price-list of Goerz-Anschütz Cameras

| Size                                       | Lens Outfit   | Approximate Weight | Dimensions   | Price              |
|--|---|--------------------|--|--------------------|
| $3\frac{1}{4} \times 4\frac{1}{4}$         | { Dagor No. 0 }<br>{ Celor No. 0 } 4 $\frac{3}{4}$ -in. | 24 ounces          | $2\frac{3}{8} \times 5\frac{1}{4} \times 6\frac{1}{4}$ in. | { \$80.25<br>82.75 |
| 4 x 5                                      | { Dagor No. 1 }<br>{ Celor No. 1 } 6-in.                | 39 ounces          | $2\frac{3}{8} \times 6 \times 7\frac{1}{2}$ in.            | { 88.75<br>89.75   |
| 5 x 7                                      | { Dagor No. 2 }<br>{ Celor No. 2 } 7-in.                | 51 ounces          | $3 \times 7\frac{3}{8} \times 9$ in.                       | { 105.75<br>106.25 |
| { $3\frac{1}{2} \times 7$ }<br>{ Stereo. } | { 1 pair Dagor No. 0 }<br>{ 1 pair Celor No. 0 }        | 43 ounces          | $3\frac{1}{2} \times 6 \times 9\frac{1}{2}$ in.            | { 134.25<br>139.25 |

See page 15 for Telephoto attachments on these Cameras

### Goerz-Anschütz Plate-holders

| For $3\frac{1}{4} \times 4\frac{1}{4}$ Camera | For 4 x 5 Camera | For 5 x 7 Camera | For $3\frac{1}{2} \times 7$ Camera |
|---|------------------|------------------|------------------------------------|
| \$2.00  | \$2.00           | \$2.50           | \$2.50                             |

### Black Sole-leather Case for Camera and Six Plate holders

| For $3\frac{1}{4} \times 4\frac{1}{4}$ Camera | For 4 x 5 Camera | For 5 x 7 Camera |
|---|------------------|------------------|
| \$4.00  | \$4.00           | \$5.00           |

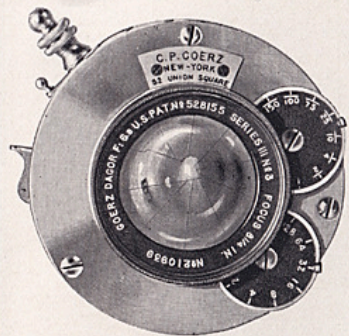
### Extra Quality Sole-leather Carrying Cases for Anschütz Camera and Film-pack Adapter

| For $3\frac{1}{4} \times 4\frac{1}{4}$ Camera | For 4 x 5 Camera | For 5 x 7 Camera |
|---|------------------|------------------|
| \$5.00  | \$6.00           | \$7.00           |

### Extension for Using Back Combination of Lens only

| For $3\frac{1}{4} \times 4\frac{1}{4}$ Camera | For 4 x 5 Camera | For 5 x 7 Camera | For $3\frac{1}{2} \times 7$ Camera |
|---|------------------|------------------|------------------------------------|
| \$10.90                                       | \$10.90          | \$14.50          | \$16.25                            |

Metal Tripod for all sizes, \$3.00

Goerz X<sup>excel</sup>L Sector Shutter*New Model*

**A**MONGST the many advantages of the Sector Shutter are to be mentioned simplicity of construction, smoothness and rapidity of action (the speed ranging from 1 to  $\frac{1}{150}$  of a second), light weight, and small size.

All mechanical parts of the Sector Shutter are encased in a tightly closed aluminum mount.

Hence they are thoroughly protected against all external influences such as concussions, dust, moisture, etc., etc.

The Sector Shutter can be fitted *between lens systems which have very little separation from each other* (e.g., double anastigmats with short focus), as the segments are only one-tenth of a millimeter in thickness.

A most important advantage of this shutter lies in the fact that it opens and closes with the maximum velocity and will remain longer than any other shutter at its "full open" position. Hence the lens will work during the greater part of the exposure *with the full size of aperture for which it is set.*

The shutter being fitted between the lenses, it is necessary that it should be well centered with them. *We can not guarantee faultless mounting unless the lens is sent to us for fitting.*

In our new XL model we have eliminated the protruding pumps. The XL Sector Shutter is perfectly circular in form. The speed is adjustable between 1 second and  $\frac{1}{150}$  of a second, *bulb, time, and instantaneous* exposures being obtainable with either finger or mechanical release.

The dial for the adjustment of the aperture, and the speed indications have been considerably enlarged, the divisions

being further apart, and consequently more easily read. The mechanical construction has been improved and simplified. The working parts of steel and brass are contained in an aluminum casing. The front cover serves no other purpose than that of dust-cover, and carrier of the front combination of the lens. The shutter can thus be worked in all its adjustments with the front cover removed.

No other photographic shutter possesses this valuable feature, which insures a perfection of assembling, and adjustment of the working parts unattainable in other designs. It makes the shutter absolutely reliable, and secures for it the foremost position among all modern between-lens shutters.

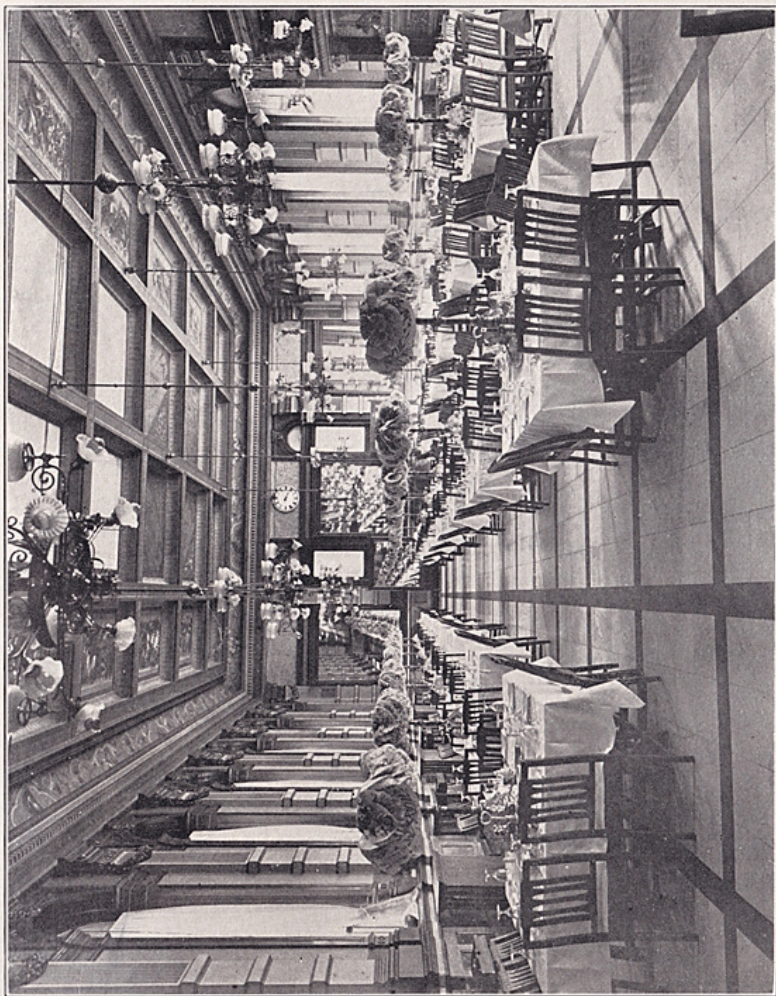
The "X<sup>excel</sup>L" release as shown in the cut is supplied with each shutter without charge. Extra releases, \$0.75 each.

The No. 0, 1, 2, 3 sizes of the Goerz XL shutters are now ready for immediate delivery, and can be fitted to our own lenses as well as to those of other manufacture, when the diaphragm aperture does not exceed 28 mm. =  $1\frac{1}{8}$  in. diaphragm opening, nor the tube-mount diameter 33 mm. =  $1\frac{1}{16}$  in.

A large model, with 40 mm. =  $1\frac{1}{2}$  in. diaphragm, is in preparation, and will take lenses up to, and including, the No. 6 Dagor and the No. 3 Celor, or other lenses of corresponding size.

## Price-list

| Size of Shutter | For Dagor Series III | For Celor Series IB | For Syntor Series ID | Price   |
|-----------------|----------------------|---------------------|----------------------|---------|
| 0               | 0                    | —                   | 0                    | \$17.00 |
| 1               | 1                    | —                   | 1                    | 17.00   |
| 2               | 2                    | 0                   | 2                    | 17.00   |
| 3               | 3                    | 1                   | 3                    | 17.00   |
| 4               | 4                    | —                   | 4                    | 20.00   |
| 5               | 5                    | 2                   | —                    | 20.00   |
| 6               | 6                    | 3                   | 6                    | 20.00   |



HENRY FUERMAN, CHICAGO

MADE WITH DAGOR (SERIES III) No. 3 (5x8) ON 8x10 PLATE

Goerz Lenses

## Special Lenses for Special Purposes

### Goerz Double Anastigmat Hypergon

*F: 22*

An extreme wide-angle lens, having an angle of  $135^{\circ}$ . The diameter of the field of view, or, in other words, the diagonal of the plate covered by the Hypergon Lens, is equal to five times, and the longer side of the plate is equal to four times the focal length of the lens. See General Catalogue

### Goerz Double Anastigmat Alethar

*(Series V) F: 11*

A Special Rapid Lens for process-work, three-color work, and reproductions. See Special or General Catalogues.

### Goerz Prisms and Liquid-Filters

For Process-workers. See Special or General Catalogue.

### Goerz Trieder Binoculars

Pernox and Opera Glasses. See Special or General Catalogue.

### Goerz New Rifle-Telescope

A telescopic sight adjustable to all rifles and shotguns—can be put on or taken off instantly—invaluable for hunters and sharpshooters. For description and prices see Special Pamphlet or General Catalogue.

### Goerz Optical Sundries

See General Catalogue.



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## Terms of Sale

**W**HEN ordering, always give explicit shipping directions. State whether by freight, express, or otherwise.

If not stated, we will use our discretion.

All goods are carefully packed and delivered to transportation companies, who will be considered acting as our customer's agents.

No charge is made for packing.

We prefer that remittance be made by draft on New York, post-office or express money-order, or registered letter. Personal checks, when from parties unknown to us, unless certified by the bank on which they are drawn, will delay shipment of goods until check can be collected. Amounts of less than one dollar may be remitted in stamps.

For the convenience of our customers we suggest that they purchase through a regular dealer in photographic goods, thus saving time and express-charges.

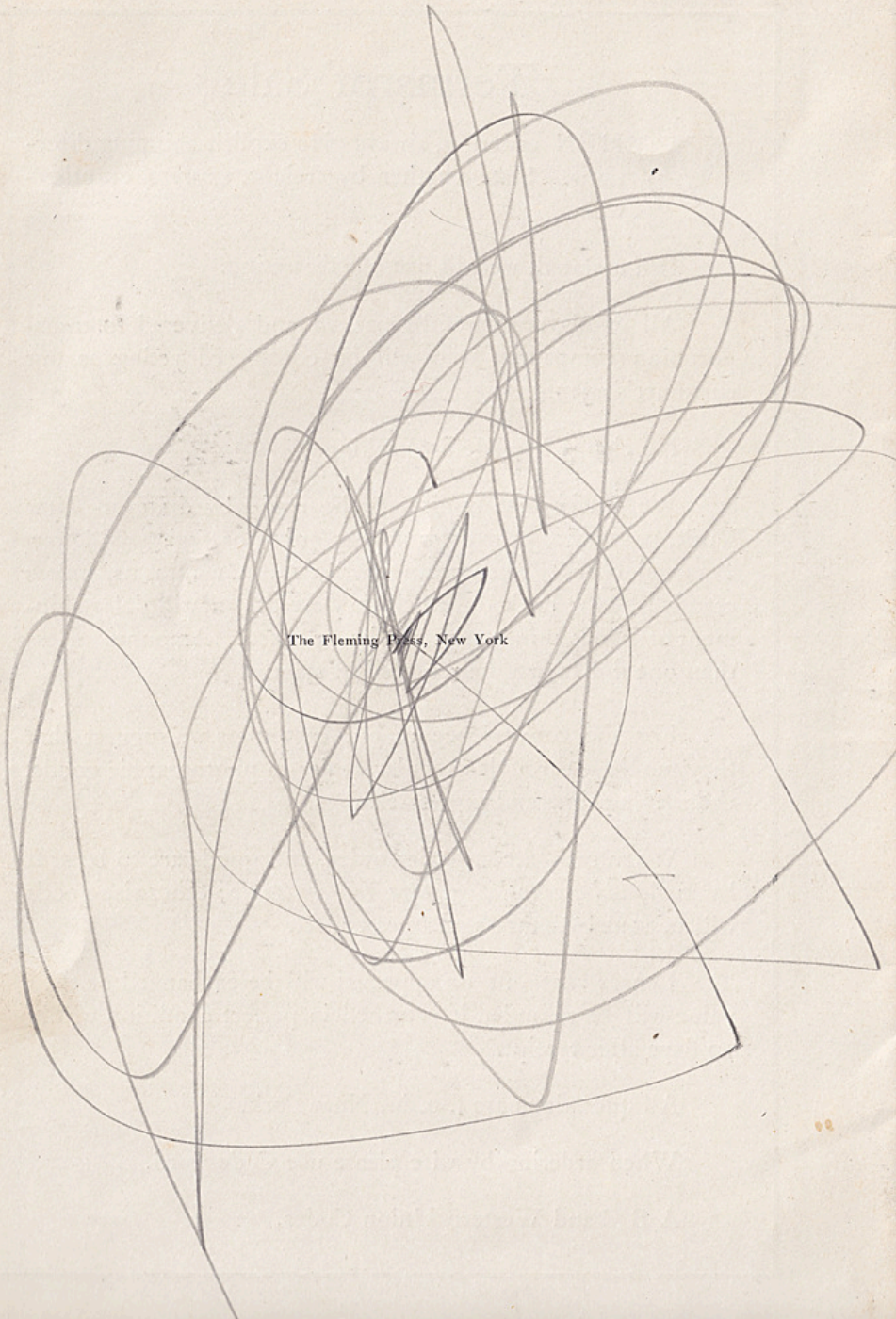
When cash accompanies order, and goods are to be sent by mail, *add amount of postage to remittance*; otherwise goods will be sent by express, charges collect.

Lenses sent out on approval will be exchanged or their value will be refunded if returned in perfect condition within 10 days after receipt.

All quotations are f. o. b., New York.

When ordering by wire please use Code-word.

A B C and Western Union Codes.



The Fleming Press, New York

