

Bausch & Lomb Optical Company

Plate Holders

Two styles—a regular double plate holder, with or without reducing kits, and a special laboratory holder constructed to open like a book. The latter is supplied with our Large Photomicrographic Apparatus. It will take either a glass plate or bromide paper and registers very accurately.

Code Word	Cat. No.	Specifications	Price
<i>Callus</i>	4630	Regular Double Plate Holder for 8 x 10 plates, without reducing kits	\$2.00
<i>Calomel</i>	4631	Same as 4630, with reducing kits	4.00
<i>Calpac</i>	4632	Special Single Laboratory Plate Holder, book-form, for 8 x 10 plates, with reducing kits	5.50

Easel

Designed for use in enlarging, reducing and copying work; constructed of wood, mounted on metal support which clamps securely to main bed of Large Photomicrographic Apparatus; provided with reducing kits and will accommodate plates of standard size ranging from 3¼ x 4¼ to 8 x 10 inches; provided also with plain board for attaching prints or copy.

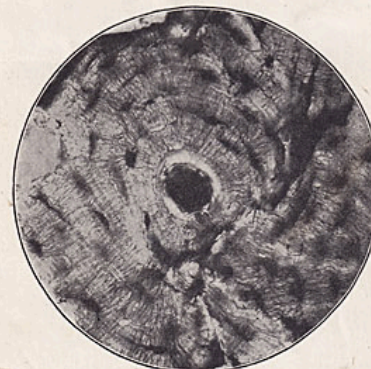
Code Word	Cat. No.	Specifications	Price
<i>Calyx</i>	4640	Easel, as described	\$12.50

Rheostats

Constructed to meet strictest requirements of fireboards and underwriters; wire of resistance coils has practically no temperature coefficient; case of expanded metal, providing for freest possible air circulation among coils; no exposed contact points.

Code Word	Cat. No.	Specifications	Price
<i>Declension</i>	4450	Fixed Form, 15 amperes, 110 volts	\$7.00
<i>Decoct</i>	4451	“ “ 15 amperes, 220 volts	18.00
<i>Decore</i>	4452	“ “ 5 amperes, 110 volts	5.00
<i>Decoy</i>	4453	“ “ 5 amperes, 220 volts	6.50
<i>Dearth</i>	4453A	“ “ 5 amperes, 110 and 220 volts	8.00
<i>Decree</i>	4454	Adjustable Form, 15 to 25 amperes, 110 volts	18.00
<i>Decuman</i>	4455	“ “ 15 to 25 amperes, 220 volts	25.00
<i>Duty</i>	4456	“ “ 20 to 35 amperes, 110 volts	27.00

Bausch & Lomb Large Photomicrographic Apparatus



Cross Section of Bone (X 225)
Taken with Bausch & Lomb 8 mm Objective.

2P1196

Bausch & Lomb Optical Company

A Valuable Laboratory Outfit

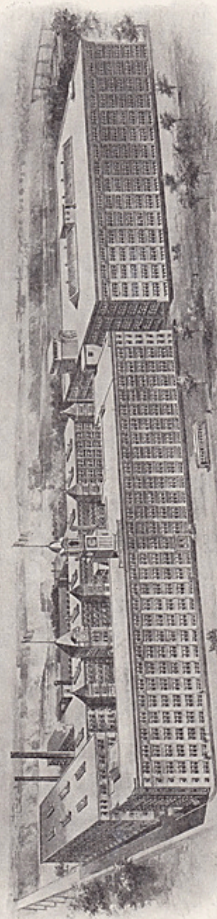
Our **Large Photomicrographic Apparatus** is designed especially for general laboratory and research work in college, commercial institution or wherever photomicrographic work of the highest grade is desired. The new models presented in this circular are the outgrowth of several years experience in developing and constructing apparatus of this general type with a view of obtaining the greatest possible stability and efficiency. They are unexcelled, we believe, in accuracy, convenience of manipulation and adaptability.

In accordance with our general policy we have endeavored to meet the requirements of the practical user of photomicrographic equipment and are indebted to Dr. Allen J. Smith and Dr. E. T. Reichert, of the University of Pennsylvania, for several suggestions embodied in these models.

Not only will this apparatus accommodate a wide range of magnifications, producing photomicrographs up to 8 x 10 inches in size, but it can also be used to advantage in photographing gross objects, in enlarging and reducing work and is thus an excellent laboratory camera. Its distinctive features are:

Distinctive Features

1. Extreme rigidity.
2. Constantly accurate alignment of parts, due to construction on single supporting stand with accurately planed optical beds, free from spring and vibration.
3. Superior illuminating system.
4. Convenient and effective adjustments.
5. Swing-out of microscope plate, permitting direct observation through eyepiece of object to be photographed.
6. Long range vertical adjustment of microscope plate, permitting use of any standard microscope.
7. Special camera box, providing for focusing on opaque screen in place of ground glass if desired.
8. Removable plate holder adapter, permitting long side of plate to be placed in either vertical or horizontal position.
9. Wide scope of adjustability and usefulness.



Works of the Bausch & Lomb Optical Co., Rochester, N. Y.

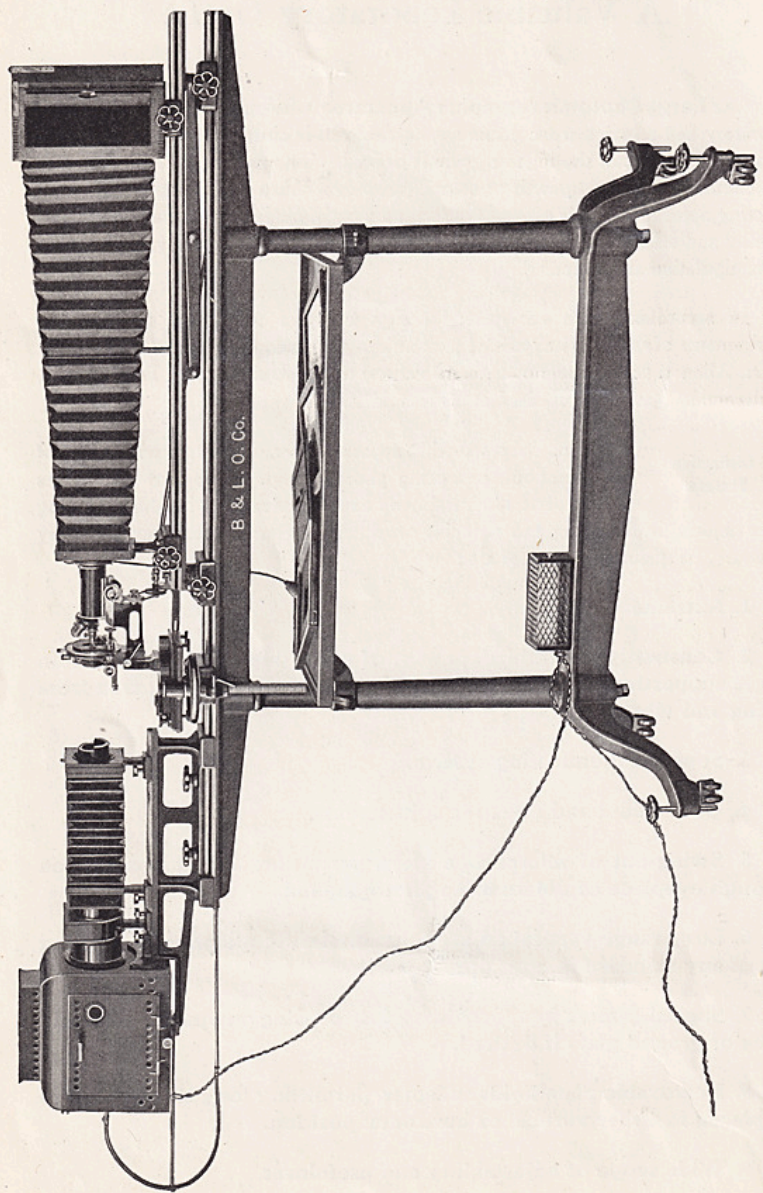


Figure I—Model G 1, Arranged For Photomicrography in Horizontal Position.

The accompanying illustrations show some of the varied possibilities of this outfit. **Figure I** shows the complete apparatus adjusted at nearly its full extension for **horizontal work**. Note the solidity of the stand, optical beds and clamps. Note, too, the extension rods controlling the lamp and the fine adjustment of the microscope from the rear of the camera box, also the long vertical adjustment screw of the microscope plate and the camera box with side door for focusing on opaque screen.

In **Figure II** the apparatus is arranged for work in a **vertical position** with the microscope elevated until its mirror comes into the optical axis of the illuminating system. Particular attention is called to the stability of the secondary adjustable bed, bearing camera, securely held in the desired position by its supporting braces clamped to the main bed. This rigid construction renders vertical work as practicable and accurate as horizontal.

The vertical position of the camera also makes it possible to photograph metals, minerals and other opaque objects by means of a vertical illuminator used in connection with the microscope.

Figure III illustrates one of the many possibilities of the apparatus as a **laboratory camera**. The illuminating apparatus and microscope plate are removed, and the camera, fitted with a regular photographic lens, is in use at one end of the main bed for photographing a gross object, top view.

Gross objects can also be photographed readily from the side or any other viewpoint desired. To accomplish this the microscope plate can be used as an adjustable object holder, and the camera on the adjustable bed can be rigidly secured at any desired position between the horizontal and vertical.

For **enlarging or reducing work** we furnish a special easel at its additional cost (see Accessories). The negatives or prints to be photographed are mounted on the easel, which is clamped to the main bed in desired position.

By removing the camera and microscope plate and adding the few required accessories the apparatus can be readily used for projection work. The optical bed on which the illuminating apparatus is mounted will accommodate any of the regular projection accessories and attachments used on our **Model D, Universal and Convertible Balopticons**.

Similarly the heavy stand with main bed constitutes an excellent optical bench for any work in the laboratory which requires such apparatus.

Because of the variety of equipment possible we list the **Large Photomicrographic Apparatus** in two models, **G** and **GG**, and in several different outfits, as indicated in the price lists.

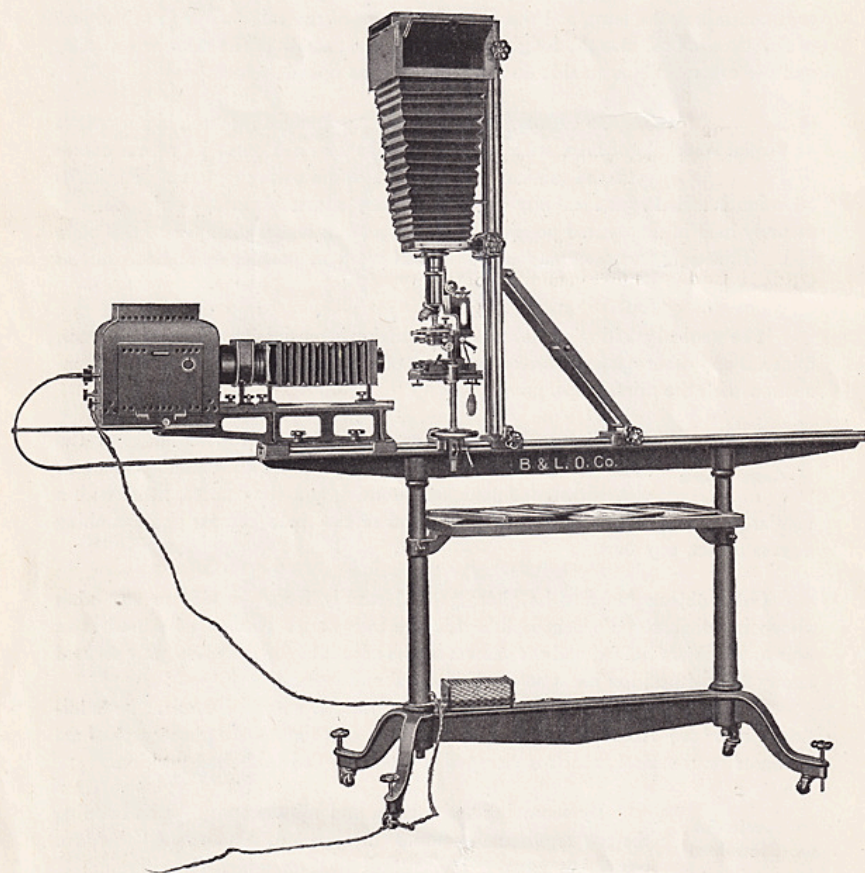


Figure II—Model G 1, Arranged for Photomicrography in Vertical Position.

Large Photomicrographic Apparatus

Model G

For Horizontal and Vertical Work

Supporting Stand—Of cast iron, massive construction, having base of four feet cast in one piece with heavy connecting rib; base has spread of 54 x 24 in. and is fitted with both castors and leveling screws; two upright supports carry main optical bed at height of 42 in.; wooden shelf for accessories, measuring 37 x 18 in., is mounted between upright supports.

Optical Beds—Three in number, of lathe type, carefully planed and accommodating supports for the different parts, which may be adjusted as desired and rigidly clamped; main bed, 78 in. (198.5 cm) long and 4½ in. (11.8 cm) wide, carries two supplementary beds— one adjustable carrying camera, and one stationary, bearing illuminating apparatus; adjustable bed, 49 in. (124 cm) long and 4½ in. (11.8 cm) wide, can be set at any position from the horizontal to the vertical and rendered absolutely rigid by its supporting braces; both main and adjustable beds graduated in centimeters and millimeters, with every fifth centimeter numbered; stationary bed is mounted on heavy casting which may be clamped to main bed at any desired point or removed without difficulty.

Illuminant—Two different electric illuminants are regularly listed with outfit— 90° arc lamp, provided with long extension feeding device for adjusting from rear of camera box, or single-glower Nernst lamp for 110 or 220 volts; both lamps mounted either in large light-tight lamp house with observation windows and spring door (see Figures I and II) or in smaller lamp house without door (see Figure IV); both lamp houses, when furnished with arc lamp, provided with small mirror mounted near one of observation windows to serve as guide in feeding lamp from rear of camera box; 5-ampere, 110-volt rheostat mounted on base of stand, when arc lamp is furnished. (Rheostats for other currents can be furnished at different prices; see Accessories.)

Condensing System—Apparatus is listed with two different condensing systems— complete and simple; complete (see Figures I & II) consists of our regular triple system, 4½ -inch diameter, in our patent ventilated mount with water cell, bellows and standards mounted on stationary optical bed; front standard of bellows has special mounting carrying a 2½ -inch diameter, 12-inch focus plano convex condensing lens for use with front lens of triple system removed, an iris diaphragm with 2⅞ -inch opening and a trough for carrying our yellow glass ray filter or cell for liquid filter, both of which are furnished with outfit; simple system consists only of this front standard with plano convex lens, iris diaphragm and ray filters as described (see Figure IV).

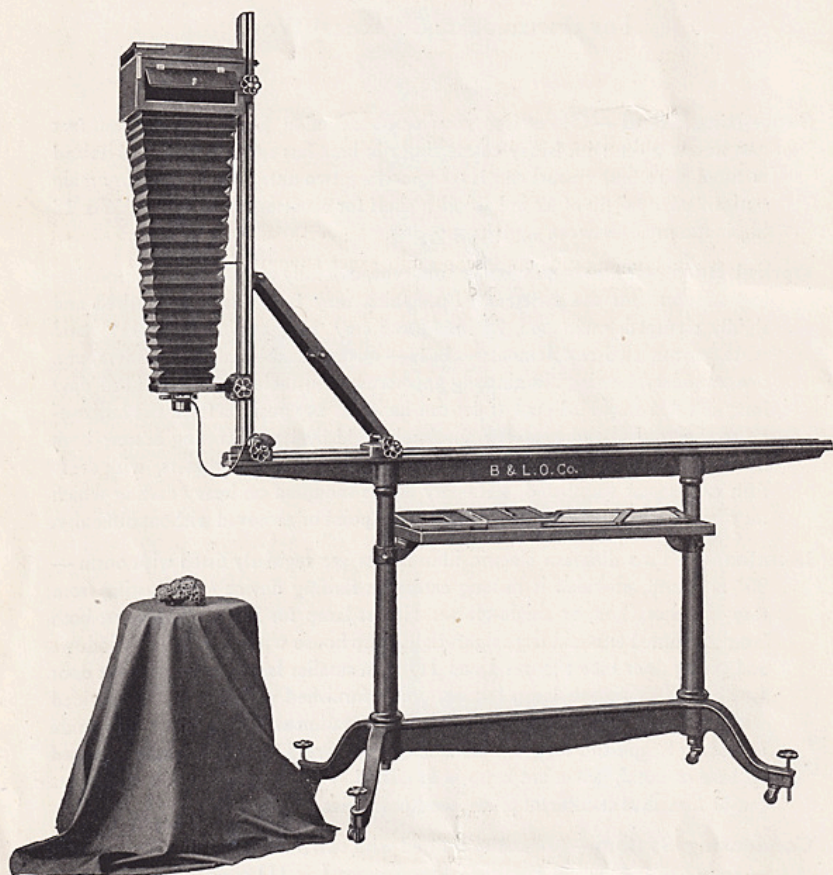


Figure III—Camera in Vertical Position, Photographing Gross Object.

Camera—Consists of supports carrying tapering bellows with draw of approximately 50 in. having wire support in center; rear support carries box of neatly finished hard wood with door in side for use in focusing image on opaque white screen if desired; supplied with reversible adapter carrying laboratory plate holder for 8 x 10 plates and kits for smaller sizes, also with two focusing screens — one ground glass with clear center and one clear glass with graduated cross lines in center; hinged cover with two springs at rear of adapter permits plate holder to be placed easily in exact position without jarring apparatus; plate holder of special book form construction, ensuring exact registration.

Shutter—Our automatic shutter, No. 4570, with steel leaves, having a maximum opening of 40 mm; may be set for instantaneous, bulb or time exposure; supplied with tube for making light-tight connection with microscope eyepiece.

Microscope Plate—Of metal, $7\frac{3}{4} \times 5\frac{1}{4}$ in., provided with three leveling screws to serve in bringing any microscope into exact alignment with optical axis of camera; fitted to main optical bed by clamping block and provided with vertical screw of 9-inch range, operated by hand wheel, for accommodation of varying center distances on different microscopes; so constructed that plate may be turned out 90° for locating field to be photographed by direct observation, and provided with a stop which brings it at once into alignment with optical axis of camera when turned back; support attached to plate carries universal joint and pulley with extension rod, by means of which fine adjustment of microscope, whether lever, prism or side adjustment, can be controlled from rear of camera box.

Dimensions—Extreme length from rear of camera box to rear of lamp house, 104 in.; height to top of camera box when horizontal, 58 in.

Price List

Code Word	Cat. No.	Specifications	Price
<i>Caaba</i>	G 1	Large Photomicrographic Apparatus complete with adjustable and stationary beds, arc lamp with adjusting rod, large light-tight lamp house, 5-ampere, 110-volt rheostat, complete condensing system, adjustable microscope plate with adjusting rod for microscope, camera and shutter, as described	\$300.00
<i>Cabala</i>	G 2	Same as G 1 but with Single-Glowler Nernst lamp in place of arc, rheostat and adjusting rod	287.50
<i>Cabas</i>	G 3	Same as G 1 but with small lamp house and simple condensing system in place of complete	280.00
<i>Caber</i>	G 4	Same as G 3 but with Single-Glowler Nernst lamp in place of arc, rheostat and adjusting rod	267.50

Our Automatic Arc Lamp, No. 4463, will be furnished with any of the above outfits, in place of the hand-feed arc and adjusting rod, at an additional cost of \$57.50.

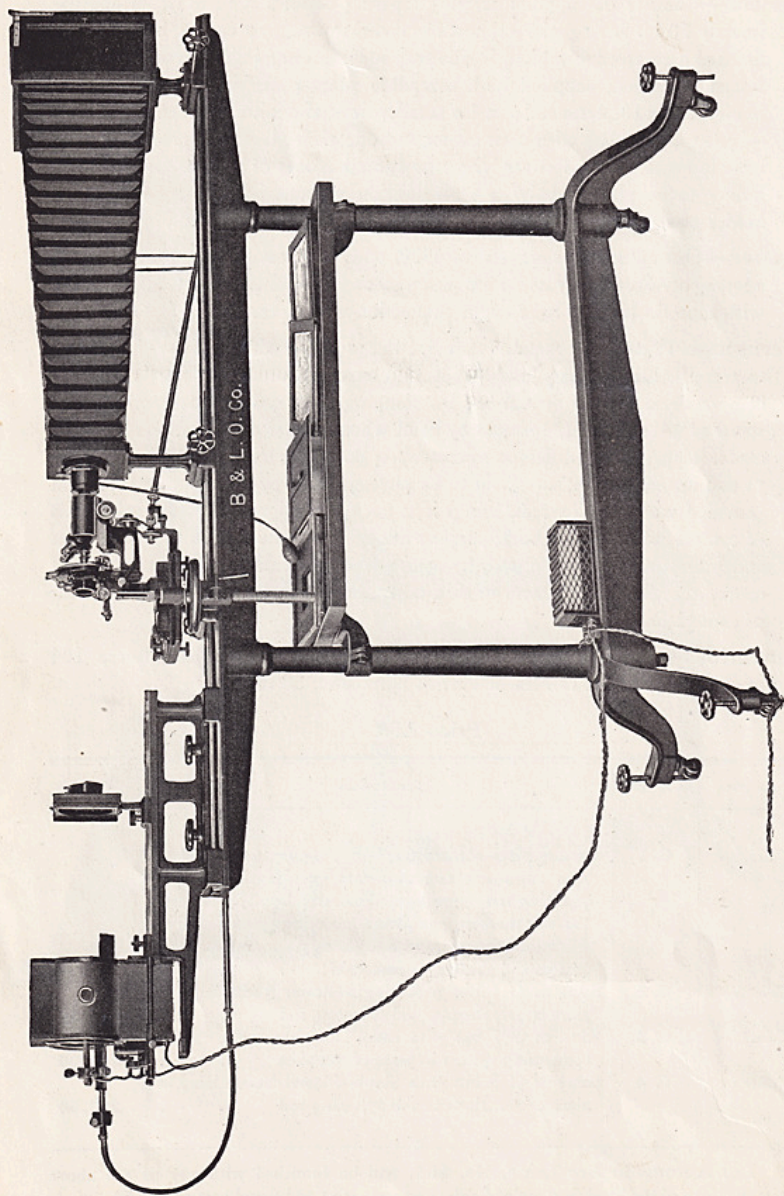


Figure IV—Model GG 3 for Horizontal Work Only; Showing Small Lamp House and Simple Condensing System.

Large Photomicrographic Apparatus

Model GG

For Horizontal Work

This apparatus differs from Model G in the matter of optical beds only. It is provided with two horizontal beds, the main bed and the secondary bed bearing the illuminating apparatus. In the other specifications and in the general construction it is identical with Model G. Thus it can be used with equal satisfaction as a photomicrographic outfit or a laboratory camera where only work in a horizontal position is required.

While illustrated here with the small lamp house and simple condensing system, it is also furnished with the complete illuminating apparatus and other equipments offered with Model G, as indicated below.

Price List

Code Word	Cat. No.	Specifications	Price
<i>Cablet</i>	GG 1	Large Photomicrographic Apparatus with two horizontal beds, arc lamp with adjusting rod, large light-tight lamp house, 5-ampere, 110-volt rheostat, complete condensing system, adjustable microscope plate with adjusting rod for microscope, camera and shutter, as described	\$265.00
<i>Cabrilla</i>	GG 2	Same as GG 1 but with single-glower Nernst lamp in place of arc, rheostat and adjusting rod	252.50
<i>Cabrit</i>	GG 3	Same as GG 1 but with small lamp house and simple condensing system in place of complete	245.00
<i>Caburn</i>	GG 4	Same as GG 3 but with single-glower Nernst lamp in place of arc, rheostat and adjusting rod	232.50

Our Automatic Arc Lamp, No. 4463, will be furnished with any of the above outfits, in place of the hand-feed arc and adjusting rod, at an additional cost of \$57.50.

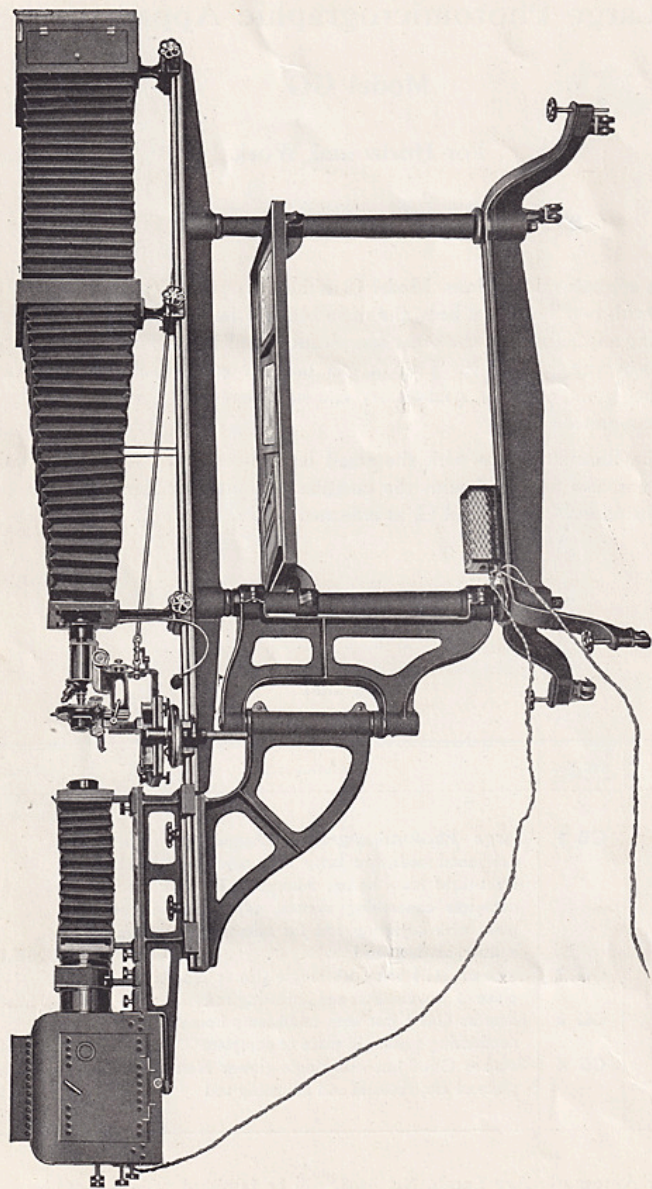


Figure V—Special Model, Showing Illuminating Apparatus in Alignment with Main Bed.

Large Photomicrographic Apparatus Special Model with Swinging Illuminating Apparatus

This modified form of our Large Photomicrographic Apparatus was originally constructed for the Westinghouse Electric Lamp Company. It affords an even wider latitude of service than the regular models, being especially designed for work in metallography although equally efficient for regular photomicrography.

A 16-inch extension of the main optical bed is mounted on a heavy support, which swings in a horizontal plane through an angle of 135° either side of the camera axis and is secured in any desired position by two strong clamping levers. The camera bellows has an exceptionally long draw, approximately 78 in., covering the entire length of the main bed if desired.

The swinging extension carries the illuminating apparatus complete. The main bed and extension can be used as one stable bed, 94 in. (239 cm) in length, by setting them in alignment and moving the illuminating apparatus forward enough to form a rigid joint between the two (see Figure V).

For illuminating opaque objects with a vertical illuminator attached to the microscope, as in metallurgical work, the illuminating apparatus can be turned at right angles to the main bed and microscope (see Figure VI). It can also be turned still further for direct oblique illumination of opaque objects if desired.

The regular specifications for this model are the same as those already given for Model G, except that no extension rod is included for feeding the arc lamp from the rear of the camera box. It can be furnished in the form of either Model G or Model GG and in any of the equipments listed under those models at an additional cost of \$75.00.

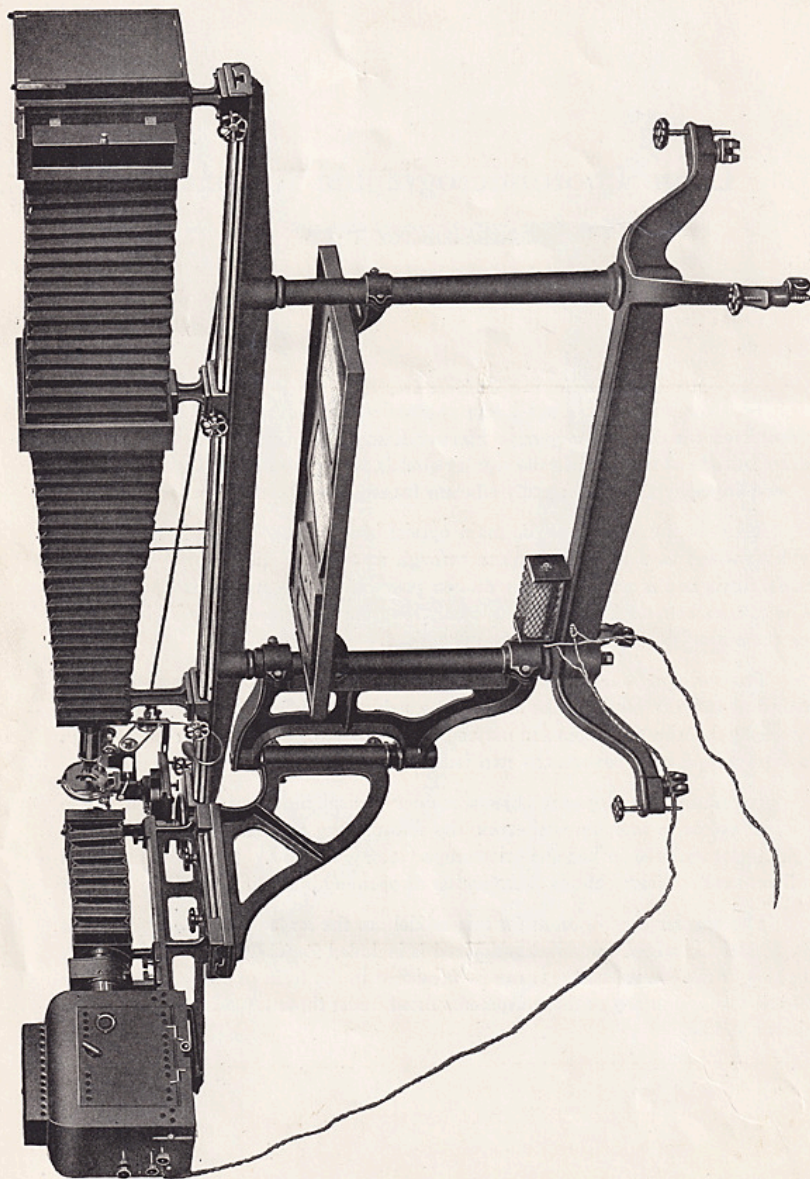


Figure VI—Special Model, Showing Illuminating Apparatus at Right Angles to Main Bed.

LP1146

Accessories

(A Partial List)

Special Microscope Attachment

A new instrument designed especially for use with Micro-Tessar objectives but can be used with other objectives as well; fitted with coarse and fine focusing adjustment; has extra large body tube and large opening in stage with condensers for 48 mm and 32 mm objectives mounted in swinging arm, the mounting for the latter condenser being of our standard substage size; condensers calculated to cover full available field of Micro-Tessars.

Code Word	Cat. No.		Price
<i>Duomo</i>	4135	Special Microscope Attachment, as described, without objectives	\$50.00
<i>Duotal</i>	4137	Condenser for 72 mm objectives, in mounting	5.00

Micro-Tessar Objectives

Designed especially for photomicrographic work, being characterized by remarkably sharp definition and unusual covering power; have an angle of view of 55°, thus covering a field approximately equal in diameter to their focal lengths.

Code Word	Cat. No.	Equivalent Focus	Price
<i>Dander</i>	4401	72 mm	\$32.00
<i>Dane</i>	4402	48 mm	26.00
<i>Dangle</i>	4403	32 mm	26.00

Focusing Glasses

Code Word	Cat. No.		Price
<i>Caddis</i>	4545	Doublet Focusing Glass	\$4.00
<i>Cactus</i>	4540	Achromatic Focusing Glass	8.00