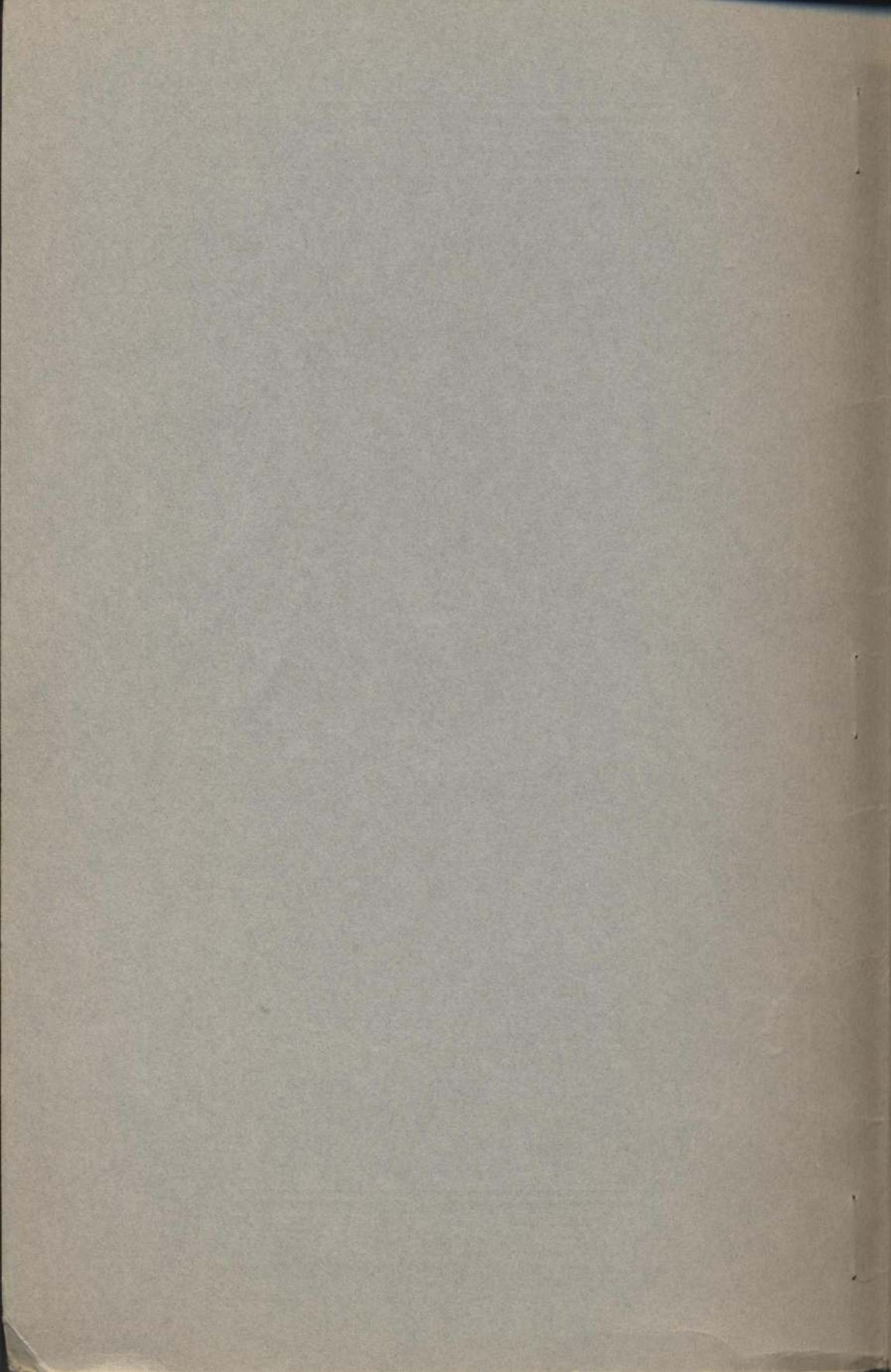


"B" MICRO PROJECTOR



Directions for Use

BAUSCH & LOMB
OPTICAL CO. ROCHESTER, N. Y., U. S. A.



Fluor

THE BAUSCH & LOMB
"B" MICRO-PROJECTOR
Cat. No. 42-63-47

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DIRECTIONS FOR USE

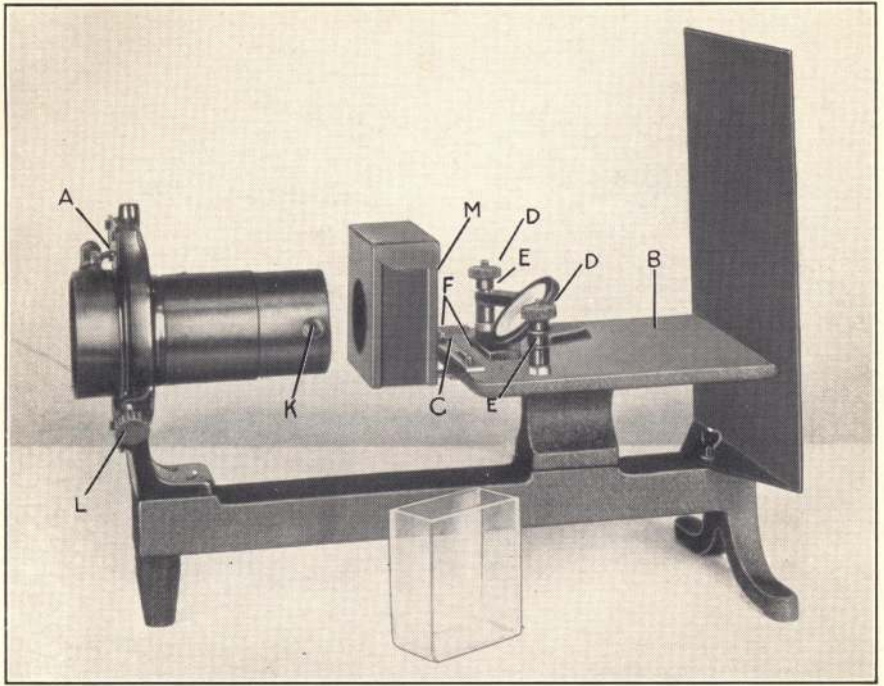
BAUSCH & LOMB OPTICAL COMPANY
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"B" MICRO PROJECTOR

Directions for Use

The Bausch & Lomb "B" Micro Projector with accessories is packed complete in one box. No special instructions are needed for removing the instrument from its case. Figure 1 shows the micro projector bed as received, without microscope or illuminator. In addition, there will be either an arc lamp or an incandescent lamp, according to the equipment ordered, and the prism shown in Figure 3.

To attach the lamp, loosen wing screw A (Figure 1) which opens the clamp ring. Insert the sleeve, on the front of the lamp, in the clamp ring and tighten the wing screw A until the lamp is held securely. Connect the lamp cord to the proper resistance or transformer terminals. If the 6-volt, 108-watt ribbon filament lamp is used,



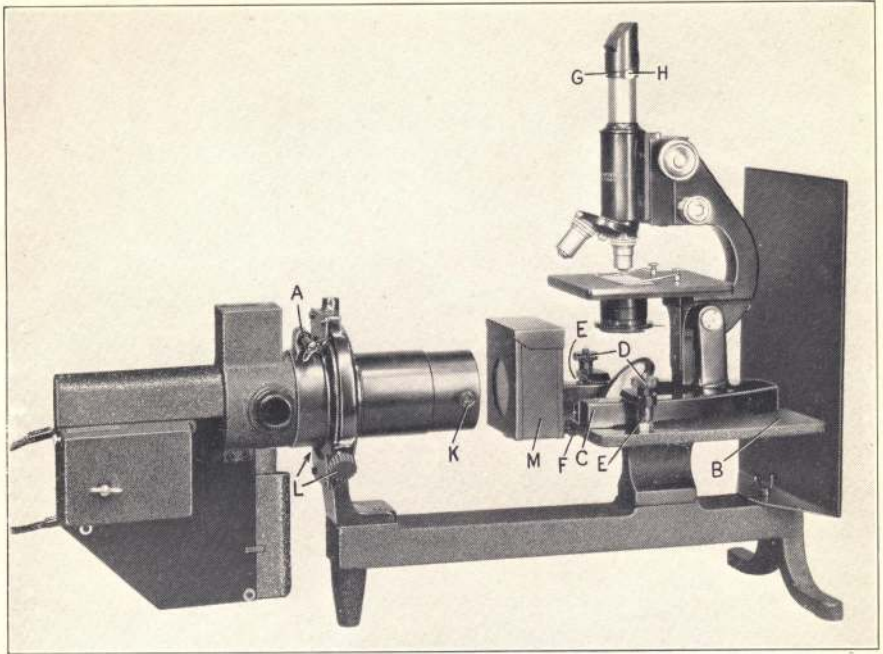
The Bausch & Lomb "B" Micro Projector

Figure 1

Legend—Figures 1, 2, 3 and 4

A—Wing Screw
 B—Microscope Plate
 C—Guide Strip
 D—Knurled Heads
 E—Clamps
 F—Screws

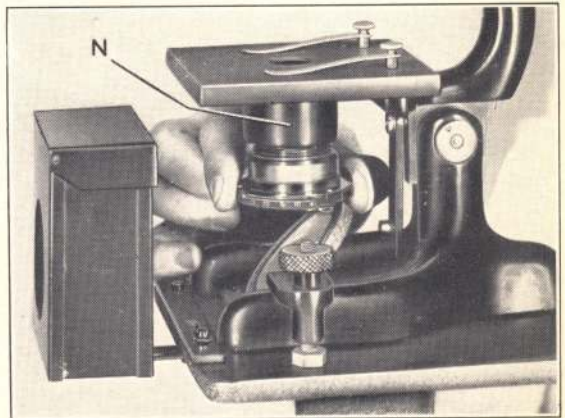
G—Reflecting Prism Adapter
 H—Prism Thumb Screw
 K—Fiber Knobs
 L—Centering Thumb Screws
 M—Water Cell Holder



*The Bausch & Lomb "B" Projector including Microscope
Figure 2*



*Reflecting Prism
Figure 3*



*Attaching Substage Condenser
Figure 4*

make sure that the filament is facing the condenser lens and is parallel with it at the center of the lamphouse opening. The socket in the lamphouse is adjustable for this purpose.

If an arc lamp is supplied for operation on direct current, the horizontal carbon should be a cored 8mm diameter carbon. The vertical carbon should be 5.6mm in diameter and cored. If the arc lamp is to be operated on alternating current, cored carbons 6.4mm in diameter should be used in both the vertical and horizontal positions.

To start the lamp, snap the cord switch to the "off" position. Insert the attachment plug at the end of the cord into an outlet box of proper voltage and current. The dark glass windows in the sides of the arc enclosure may be turned up to adjust the carbons before lighting. The carbons

should be adjusted in the holders so that when the tips are brought together the end of the horizontal carbon will be nearly over the center of the vertical carbon. Separate the carbons by turning the knob and close the dark glass windows. Turn the cord switch on. Bring the carbons together again and then draw them apart slowly until they are separated by about $3/16$ of an inch. The action of the arc may be observed through the dark glass windows.

Start the automatic feed on the automatic arc by pulling outward on the knob. After the first adjustment of the carbons, the feed mechanism will keep the proper separation between carbons. Slight adjustments of the carbons may be required occasionally as they burn away.

When operating the arc lamp on direct current, the positive (+) wire of the supply

line should connect to the upper terminal post of the lamp. If the polarity of the line is not known beforehand, it may be determined after the arc is struck. After the arc has been burning for a few seconds, it will be noticed that one carbon has a pronounced white hot area at the tip. This is termed the positive crater and should be formed on the horizontal carbon. If this crater is seen to form on the vertical carbon tip, remove the attachment plug from the outlet box and replace it in the reversed position. It is well to mark a (+) sign on the proper terminal of the plug and on the corresponding side of the outlet for convenience.

To place the microscope in position on the microscope plate B, loosen the clamps E by unscrewing the knurled heads D (see Figures 1 and 2). Remove the substage mirror with its fork from the microscope. Set the micro-

scope on the plate with the toes of the base under the clamps E, and "straddling" the mirror F. Do not tighten the clamps E until after attaching the reflecting prism as directed in the following paragraphs.

The Reflecting Prism mounts directly above the microscope eyepiece. As the microscope is used in the vertical position, it is necessary to reflect the light beam from the eyepiece at right angles so that the image may be viewed on a vertical screen. An ordinary mirror cannot be used for this purpose, as the reflection from the two glass surfaces would cause a doubling of the image.

To attach the reflecting prism, first take out the microscope eyepiece. Remove the reflecting prism adapter G (Figure 3) from the prism mount. The adapter consists of a short tube with a thumb screw H in one side. It fits snugly over the prism mount, but can easily be pulled out. Slip the adapter over

the eyepiece tube of the microscope, tighten the thumb screw H with the upper end of the adapter flush with the end of the eyepiece tube. Insert the eyepiece. Now slip the tube of the prism mount over the adapter. The prism may be turned about the microscope eyepiece tube by loosening the screw H. By this means it is possible to have the projection screen placed at either side or end of the projector. The prism may be tilted slightly up or down to obtain the desired projection angle.

The Glass Water-Cell fits into the Water-Cell holder M (Figures 1 and 2) attached to the microscope plate. The lid of the holder is hinged to permit easy removal of the cell. Since the cell is fused instead of cemented together, it will withstand any heat absorbing or color filter solution that will not attack the glass.

A satisfactory heat absorbing solution for use with the carbon arc consists of a 2% solution of copper sulphate in distilled or boiled water. With the Mazda bulb as a light source, the water alone will be found sufficient.

The Attachable Substage Condenser. The school micro projector is designed to work with any of the standard microscopes. Some inexpensive microscopes do not have substage condensers. In order to obtain proper illumination with such microscopes, a substage condenser should be used with all objectives whose focal length is 16mm or shorter. This substage condenser is illustrated in Figure 4. It consists of a tube N which must be screwed to the threaded ring on the under side of the microscope stage. Such inexpensive microscopes will have an Iris diaphragm screwed to this ring. Remove the Iris diaphragm and screw the

tube N in its place. Screw the Iris diaphragm to the under side of the condenser lens mount as shown in Figure 4 and then insert the condenser in the tube. When a 32mm or 48mm objective is used for projecting, the condenser should be removed and no condenser used. For all other powers, push the condenser into the tube as far as it will go.

Note: In some of the earlier models of the simple Bausch & Lomb Microscopes, it may be found impossible to unscrew the Iris diaphragm because of interference of the small operating handle. In this case do not remove the screws holding its adapter to the underside of the stage, because this will upset the careful centering adjustment made at the factory. Instead bend the handle downward gently, and just sufficiently to permit clearance of it.

If the microscope has a built-on substage,

remove all but the bottom element of the substage condenser. Place a specimen on the stage and focus on it with a 16mm objective or one of similar power. Enough light should fall on the screen to permit focusing. When the image is in focus on the screen the illumination may appear one sided. If so, move the microscope slightly sidewise or backward and forward, or both, to center the light in the field. Move the substage condenser up or down until the field projected in the screen is evenly and completely filled with the maximum amount of light. For objectives shorter in focus than 8mm, the entire substage condenser should be used if the condenser is of the built on form. In this case, the condenser will have to be focused close to the specimen.

To Adjust Illumination, place the micro projector 6' or 8' from the projection

screen with the reflecting prism facing the screen. Turn on the illumination. Remove the mirror from your microscope or swing it out of the way and set the microscope directly over the mirror fastened permanently to the microscope plate. By means of the two fibre knobs K, Figures 1 and 2, slide the illuminator condenser lens in or out until an image of the light source is formed on the mirror. A piece of paper held over the mirror may assist in this focusing. If the image does not fall in the center of the mirror, adjust the thumb screws L (Figures 1 and 2) until the image centers properly.

Place a specimen on the stage and focus on it with a 16mm objective or one of similar power. Enough light should fall on the screen to permit focusing. When the image is in focus on the screen, the illumination may appear one-sided. If so, move the

microscope to one side or the other or back and forth to center the light in the field.

When all of the adjustments have been satisfactorily made, tighten the clamps E firmly, to hold the microscope in this position. In spite of the fact that the adjustment seems somewhat complicated in this written description, it will be found to be simple in actual execution to the extent that the entire process can be accomplished in a minute or two after it has been done once or twice.

REPLACEMENT PARTS

<u>Catalog #</u>	<u>Code Word</u>	<u>Specifications</u>
42-47-28	Cegit	Water cell, Pyrex glass, polished plane surfaces, fused construction.
42-42-36	Cejat	6-volt, 108-watt, ribbon filament bulb, prefocus base.
41-42-72-73	Duahw	Cored carbons--25 pair for D.C., 8mm and 5.6mm diameter.
41-42-64	Dyifj	Cored carbons--6.4mm diameter for A.C.

