
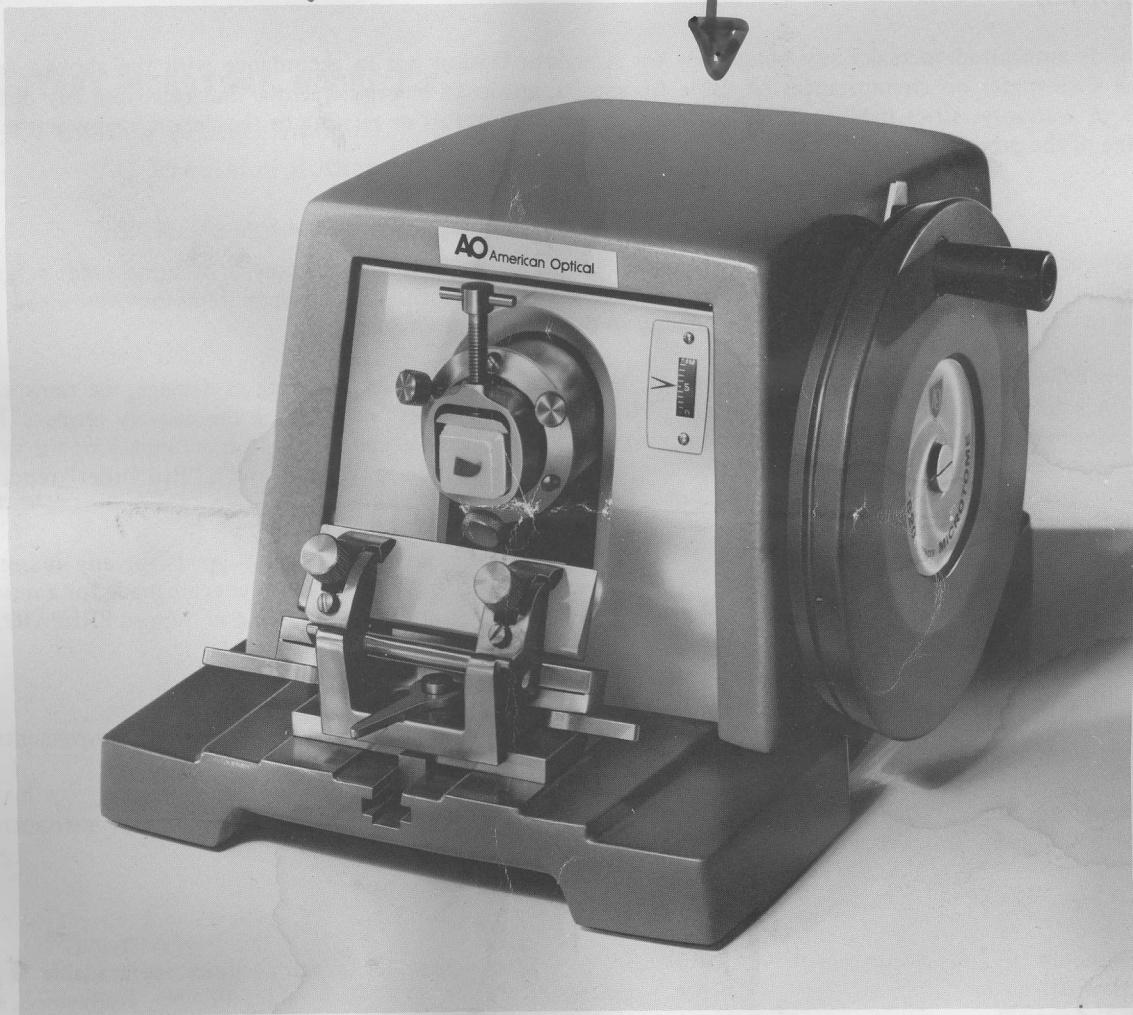


# AO® ROTARY MICROTOME

## Model 820

### REFERENCE MANUAL

Keep w/ 



© American Optical Corporation 1979

**AO®** American Optical  
SCIENTIFIC INSTRUMENT DIVISION  
BUFFALO, NY 14215

Price \$1.00

## WARRANTY

For 1 year from the date of purchase by the end-user, American Optical will repair or replace, at its option, this product for shipping charges only, if defective in workmanship or material. Contact your ordering dealer for instructions and furnish original invoice information.

This warranty does not apply if the product has been misused in any way, or has been altered or repaired by other than an authorized American Optical Representative.

*THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES IMPLIED OR EXPRESSED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.*

No one is authorized to make any obligations for American Optical not in accordance with the above. American Optical shall under no circumstances be liable for special, incidental or consequential damages from any negligence, breach of warranty, strict liability or any other theory arising out of or relating to the design, manufacture, use or handling of the product.

## CLAIMS AND RETURNS

If discrepancies are discovered, an immediate report should be made to the customer's ordering point referring to the packing list number. All packing should be carefully examined to insure that no small items are overlooked. Claims for loss or damage in transit should be made directly to the transportation company.

If, upon delivery, the outside of the packing case shows evidence of rough handling or damage, the transportation company's agent should be requested to make a "Received in Bad Order" notation on the delivery receipt. If there is no exterior evidence of rough handling upon delivery, but concealed damage is evident upon unpacking the shipment within 48 hours of delivery, the transportation company should be requested to make out a "Bad Order" report. This procedure is necessary in order to maintain the right of recovery from the carrier.

Customers are requested to contact their ordering dealer for permission to return any goods for any reason. The request should indicate the date and number of the invoice, or packing list. If arrangements are made for a return, the material should be plainly tagged with the customer's name and address, carefully packed and shipped PREPAID.

## PRODUCT CHANGES

American Optical Corporation reserves the right to change designs or to make additions to or improvements in its products without imposing any obligation on itself to add such to products previously manufactured.

The equipment supplied may not agree in all details with our description or illustrations because instruments are subject to modification and improvement.

## SERVICE

Repairs should be performed only by qualified service personnel. Complete repair facilities are available at many AO authorized dealers, and AO Technical Service Centers in Buffalo, N.Y., Rosemont, Ill., No. Hollywood, Calif., Edison, N.J., and Dallas, Texas.

## TABLE OF CONTENTS

CLAIMS & RETURNS . . . . .	2
PRODUCT CHANGES . . . . .	2
PRELIMINARY PROCEDURE. . . . .	4
THE KNIFE CLAMP . . . . .	4
ACCESSORIES . . . . .	5
USE . . . . .	7
MAINTENANCE . . . . .	8

### ROTARY MICROTOME, MODEL 820

Basic Package Includes

- |                                 |                    |
|---------------------------------|--------------------|
| - AO Precision Rotary Microtome | - 955 Handle       |
| - 822 Knife Holder              | - 969 Pike Oil     |
| - 942 Knife                     | - Reference Manual |
| - 961 Back                      |                    |

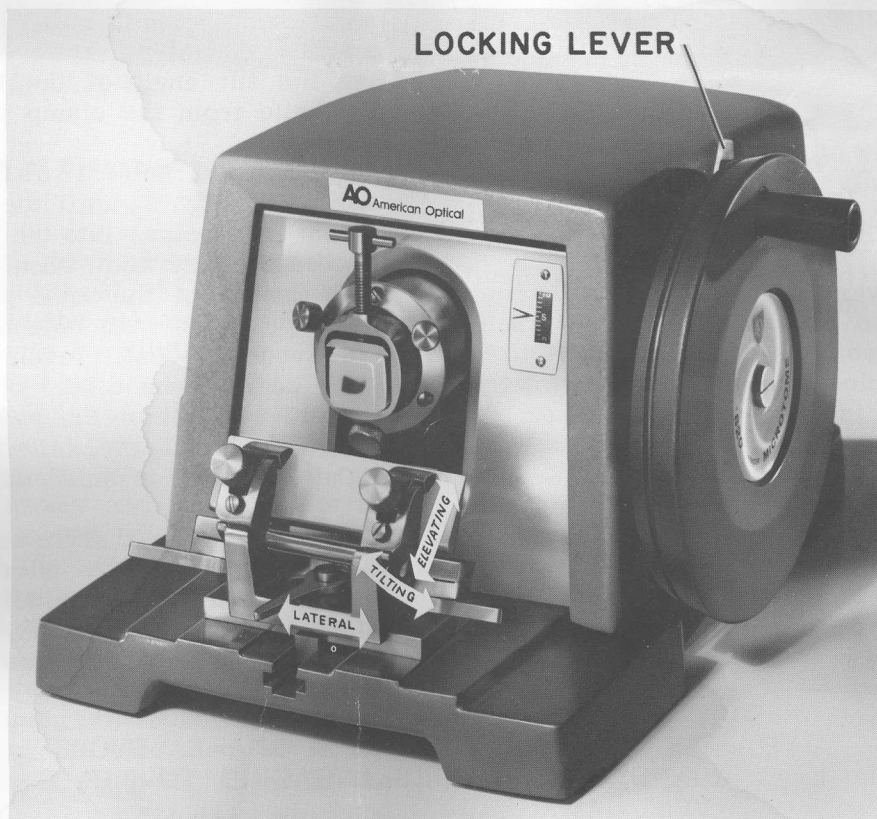
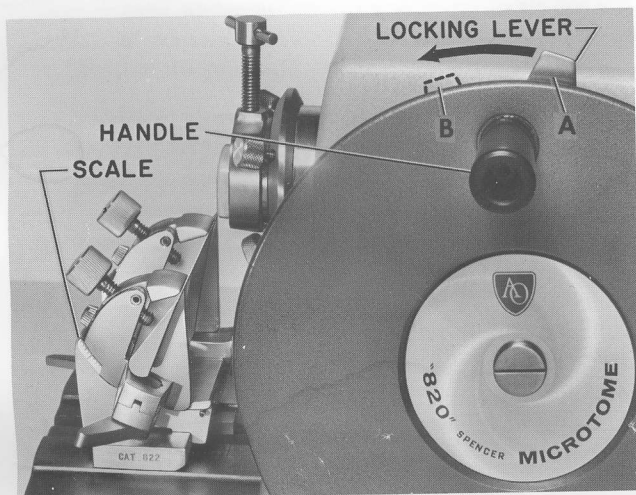


Figure 1. The AO 820 Microtome

## PRELIMINARY PROCEDURE

To unpack, use cloth tape to lift microtome 3 or 4 inches to remove from die cut. Front flap of die cut will then snap back under the instrument. Grasp microtome firmly under front and back of base and lift from box. Do not attempt to remove instrument from box by using the cloth tape.

Place the microtome on a table with the crank or drive wheel on the right-hand side, Fig. 1. Remove instruction tag and protective dust cover from instrument. Remove rolled tissue from around feed barrel and discard.

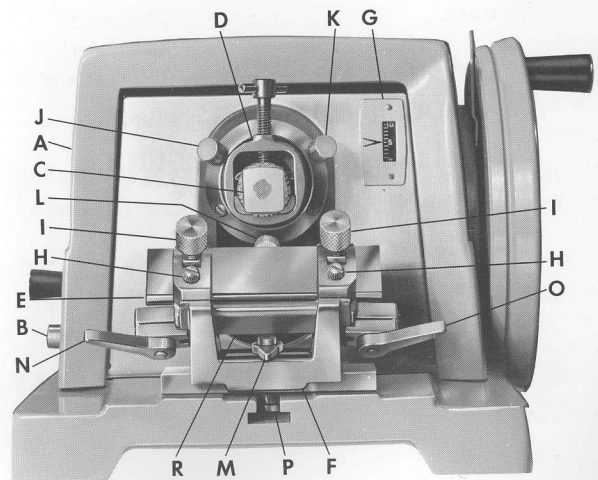


**Figure 2. The Locking Lever  
(A in Locked and B in Unlocked Position)**

The locking lever at the top of the wheel prevents forward rotation of the drive wheel when moved beyond the handle (position A, Fig. 2). To unlock, move the lever toward the front of the instrument to position B, Fig. 2. Do not do so, however, until all set up steps have been completed. Raise cover A, Fig. 3, and note the inclined surface of the feed, A, Fig. 4, and feed screw tip B. Remove the piece of cardboard placed between them to prevent damage during shipment. Wipe excess grease off surface leaving a thin coat. (Refer to Maintenance.)

**NOTE - LOCKING LEVER IS NOT A BRAKE. STOP HANDWHEEL BEFORE ENGAGING TO PREVENT DAMAGE.**

**NOTE - LUBRICATE THOROUGHLY BEFORE USE. SEE MAINTENANCE, PAGE 8.**



**Figure 3. Front View of 820 Microtome**

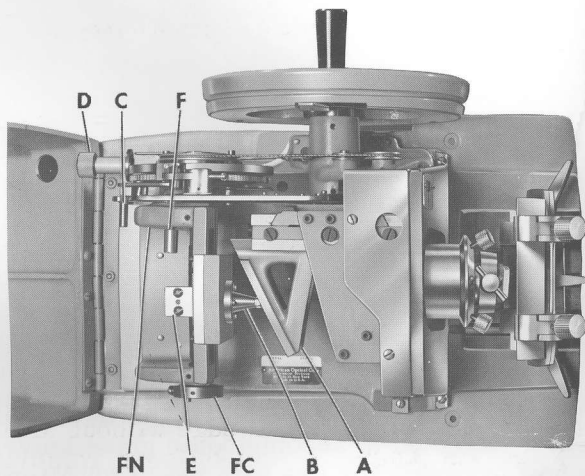
## THE KNIFE CLAMP

Moving wrench M, Fig. 3, counterclockwise frees the clamp for movement toward or from the specimen, removal from the microtome, and also frees the knife holder so that it can be moved sideways on its base plate. This adjustment permits shifting the knife to use another part of the knife edge without altering the tilt angle of the knife or removing the knife from the clamp jaws.

To insert the knife loosen the two clamp screws I, Fig. 3, until the knife E can slide (from either side) into the jaws of the clamp. The edge of the knife should be exactly level with the top of the back jaw. If not level, raise or lower each side by turning the two set screws H until level. This will place knife edge at the center of rotation of knife holder. Tighten the two clamp screws I alternately until the knife is held firmly. Hand tightening is sufficient.

To adjust the knife angle move levers N and O, Fig. 3, toward the microtome and rotate the upper part of the holder until the desired clearance angle is obtained. Scale (Fig. 2), graduated in 2° increments may be used as

a reference. The proper clearance angle depends on the angle of the knife edge and the material to be sectioned. The angle may be changed by loosening the clamping mechanism, N, O, Fig. 3, and tilting the knife to the new position, without loss of material when the knife is level with the rear jaws of the clamp, as the knife edge is then at the center of rotation. Be sure that all clamps and set screws are firmly hand tightened before cutting, to prevent vibration or creeping. Hand tightening is adequate... the use of other tools is not only unnecessary, but can damage the instrument.



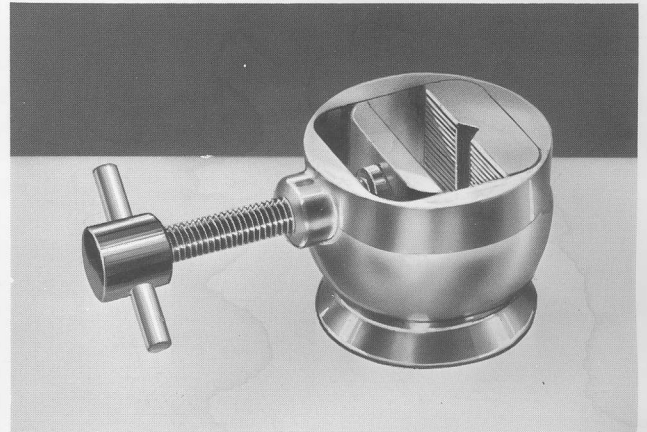
**Figure 4. Top View of Uncovered 820 Microtome**

To remove the knife holder loosen base clamp nut by moving wrench M, Fig. 3, counter-clockwise and slide the holder from the microtome. Replace by sliding back on the base of the microtome. Lock by moving wrench M clockwise. The clamping position of the locking levers for knife angle N, O, Fig. 3, can be changed. Remove the knife from holder. Loosen levers and rotate holder up until it may be removed from its base. Unscrew lever until the hexagonal nut, D, Fig. 5, opposite the lever can be pushed out of its serrated socket. Rotate the hex nut in the direction the lever is to be repositioned, reinsert into the serrated socket and tighten lever. The clamping direction may be reversed by removing the lever and hex screw from each side and replacing them in the opposite sides, since one set has right-hand and the other left-hand threads.

The knife leveling screws and wedges can be removed after removal of set screw I, Fig. 3, tilting the jaw back and lifting out through the slot in the jaw of the clamp. Replace the left wedge in the left bracket and the right in the right bracket.

## ACCESSORIES

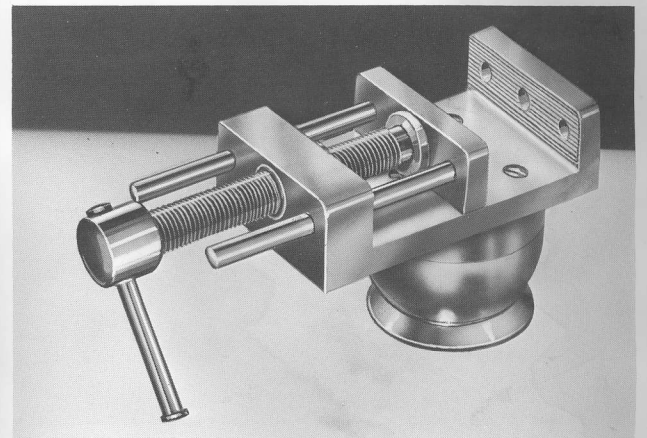
### 825 Object Clamp



A ball and flange type object clamp #825 is supplied as standard with the "820". Specimens up to 32mm by 27mm can be accommodated. Three knurled screws (J, K, and L, Fig. 3) orient and rigidly lock the clamp into position.

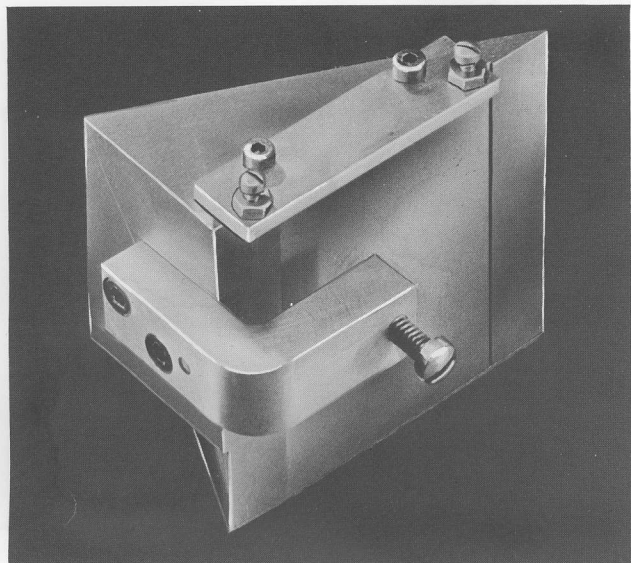
If an object disc is used to mount the specimen, it is held firmly in the V groove between the upper and lower jaws of the clamp. For use with a mold rather than an object disc, the lower (V grooved) jaw is removed simply by lifting it out from the clamp.

### 828 Johns Hopkins Clamp



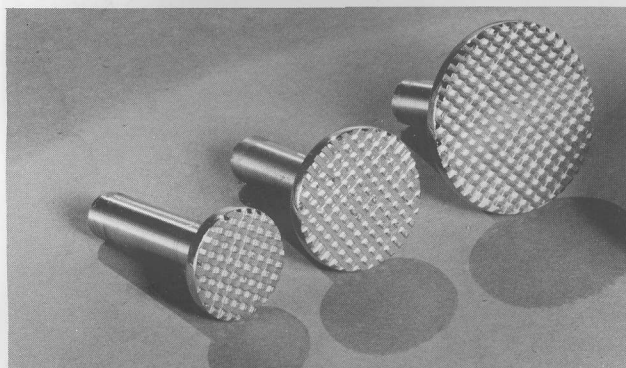
The No. 828 Johns Hopkins Clamp can be supplied as an accessory with the "820". The clamp is 1-3/4" wide...jaws have a depth of 5/8" and open to a maximum of 1-7/8" to accommodate various sizes of blocks.

### 829 Thin Section Adapter



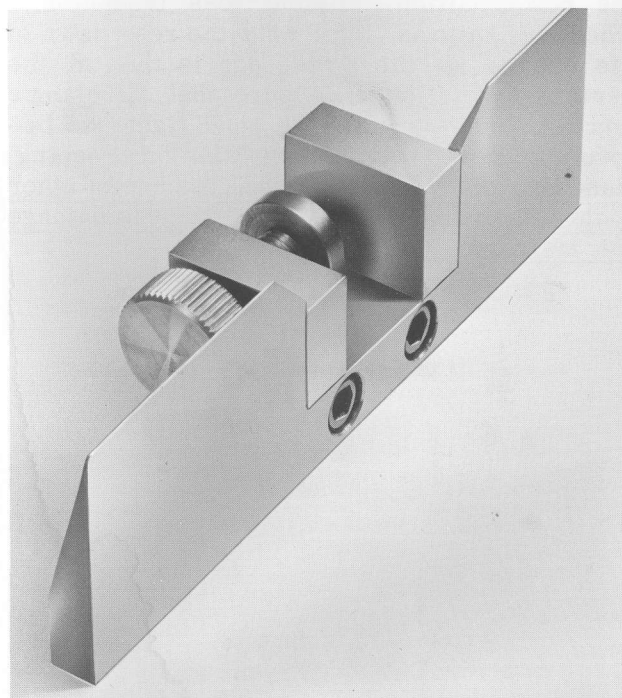
The 829 Adapter A, Fig. 5, can be clamped onto the diagonal feed surface of the 820 Microtome and reduces the rate of feed by a factor of 20. For example, with this attachment the actual specimen advance when the indicator G, Fig. 3, is set at 20 microns will be 1 micron. The adapter is held in place by a clamp screw at the end of the bracket passing back of the diagonal feed and leveled with the screws E and F, Fig. 5. Use a light neutral grease on the new feed surface. (Refer to Maintenance.) The use of a glass knife holder is recommended with this adapter.

### 813, 812, 811 Object Discs



Object discs of 7/8", 1-1/8", and 1-1/2" diameters respectively, are available as an accessory if desired.

### 823 Glass Knife Holder



The 823 Glass Knife Holder, a new knife holder designed to accommodate glass knives, is now available for use with the "820" Microtome equipped with thin sectioning adapter No. 829.

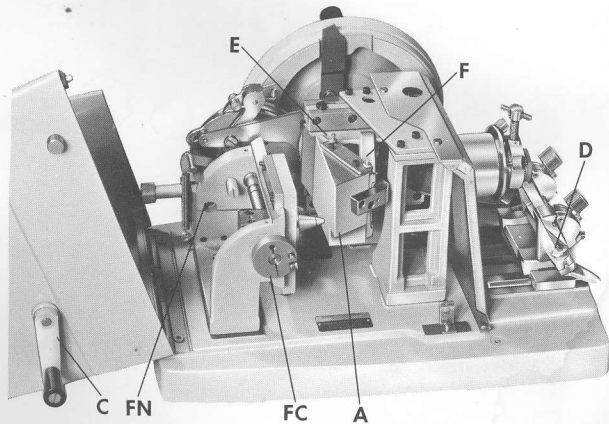
### 966 Razor Blade Holder



The Model 966 razor blade holder is placed in the jaws of the knife holder with the set screw of the razor blade holder resting on the base R, Fig. 3, and the set screws I tightened alternately until the 966 is firmly clamped in a level position.

## USE

Place the specimen C, Fig. 3 in the clamp D; the knife E in the knife holder F; and adjust the proper angle for the material to be sectioned. Set the index G to the desired thickness by turning the knob D, Fig. 4, at the back of the microtome. Adjust alternately the three knurled clamp screws J, K, and L, Fig. 3, until the specimen



**Figure 5. AO Microtome  
With Thin Cutting Attachment (A)**

surface is nearly parallel with the knife edge. Adjust the knife for the proper clearance angle.

Bring the knife close to the specimen and tighten the knife clamp. Before cutting make sure that the set screws and levers on the clamp D, Fig. 3, and the Knife Holder F are firmly tightened to avoid vibration.

The first few cuts will be incomplete until the surface of the block is squared off. If more feed is desired between cuts, the crank C, Fig. 5, on the left side of the microtome can be advanced by hand at the end of the stroke. Be careful not to advance too rapidly as the specimen or the knife may be damaged.

When the feed screw reaches the end of its travel, block E will push against F, Fig. 4, to disconnect the feed mechanism and prevent jamming. Turn the crank on the left side of the microtome, C, Fig. 5, to return the feeding mechanism to the other end of the feed screw and lift up lever C, Fig. 4, to re-engage the feed mechanism.

If difficulties arise in cutting, refer to "Effective Use & Proper Care of the Microtome".

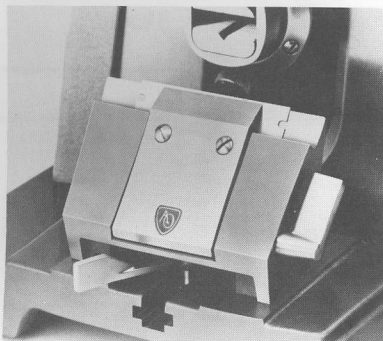
**NOTE - LOCKING LEVER IS NOT A BRAKE. STOP HANDWHEEL BEFORE ENGAGING TO PREVENT DAMAGE.**

## 817 Disposable Blades, with Dispenser

Disposable Blades offer quick accessibility to a fresh, sharp cutting edge at all times. The 75mm Blades (100 per pkg.) are made of heat treated, hardened tool steel. Light coating of protective lubricant assures long shelf life.

Blade Holders are available to fit all 820 Rotary Microtomes.

Write for SB817.



## MAINTENANCE

The microtome is well made and a long useful life of precision cutting may be expected when the microtome is given proper care. After use, clean the instrument by brushing or wiping off any ribbon fragments. Paraffin residue may be removed from the knife holder with a cloth moistened with xylene. The slides of the knife holder should be kept oiled with Pike Oil. Relubrication should be done when the cleaning removes the oil or grease and is necessary for free moving use of the knife clamp parts.

The microtome lubrication points are indicated in Fig. 6 and inside cover. The surfaces marked "G" should be greased every 2 months when the microtome is used most of the working day and at least every 4 months with average use. Use a small amount of good light neutral grease. A few drops of Pike Oil should be put in the oil holes and slides marked O1 and O2 in Fig. 6, every 2 weeks for average usage, and with heavy usage the slide marked O1 should be oiled every week.

A lighter oil like AO #970 Cryo-Cut Oil may be required when the microtome is used in cold chambers or cold rooms.

After considerable use the friction on the feed screw decreases and must be tightened for continued regular cutting. When the hand feed crank on the left-hand side of the microtome does not offer a slight resistance or

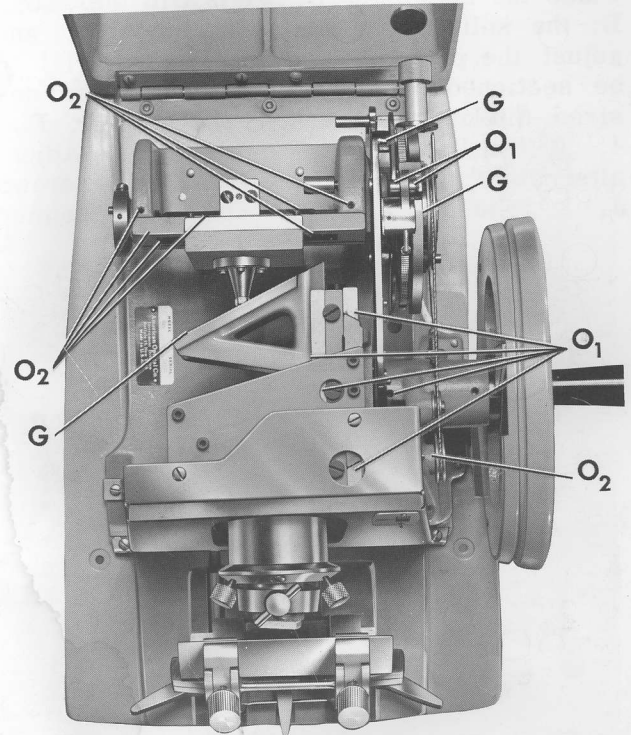


Fig 6. Lubrication Diagram for 820 Microtome

drag, tighten the screw at FN, Fig. 5, one turn and the screw seen from the outside opposite this one turn, alternately until a slight frictional drag is felt on the hand crank after the cover is replaced. This adjustment is also necessary should the pawl not lift up properly for moving the ratchet wheel.

## SERVICE

Repairs should be performed only by qualified service personnel. Complete repair facilities are available at many AO authorized dealers, and AO Technical Service Centers in Buffalo, N.Y., Rosemont, Ill., No. Hollywood, Calif., Edison, N.J., and Dallas, Texas.

## PARTS MANUAL

A LISTING OF PARTS AND ILLUSTRATIONS FOR THE ROTARY MICROTOME IS CONTAINED IN SEPARATE PARTS MANUAL 820 PM.

Available on Request.