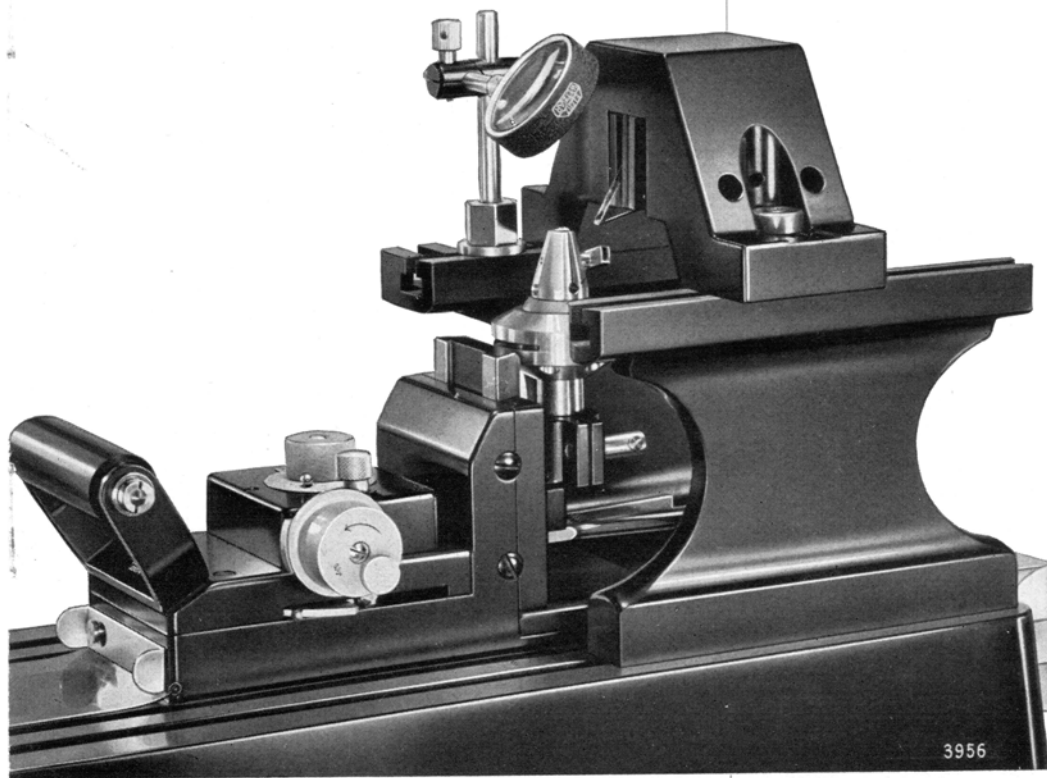


# Base Sledge Microtome

No. 1300

Special model  
with micrometer screw  
for section thickness  
of 0.1 to 20 microns



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ERNST LEITZ GMBH WETZLAR

53-5/Engl.

## Base Sledge Microtome No. 1300

Special model  
for sections  
0.1 to 20 microns thick

This special model of the large base sledge microtome not only enables sections of 1 to 20 microns in thickness to be cut, but an additional micrometer adjustment mechanism can be used to obtain, under favourable circumstances, sections as thin as 0.1 micron in manual operation while the automatic specimen feed is disconnected.

The control head for operating the micrometer mechanism is situated on the right of the object sledge. It is supplied with interchangeable drums (1) which are attached according to the section thickness required. Micrometer drums are available for raising the object by 0.1, 0.2, 0.3, 0.5 or 0.8 micron, adjustment being effected by turning the drums until they engage a catch.

The control (6) with which the object is raised to the required height is fitted with a graduated dial (7) from which it is possible to read off the height setting of the specimen. The range covered by one complete revolution of this dial is 125 microns, 1 graduation corresponding to 2.5 microns. The graduated dial can be returned to the zero position with the specimen at any height. In

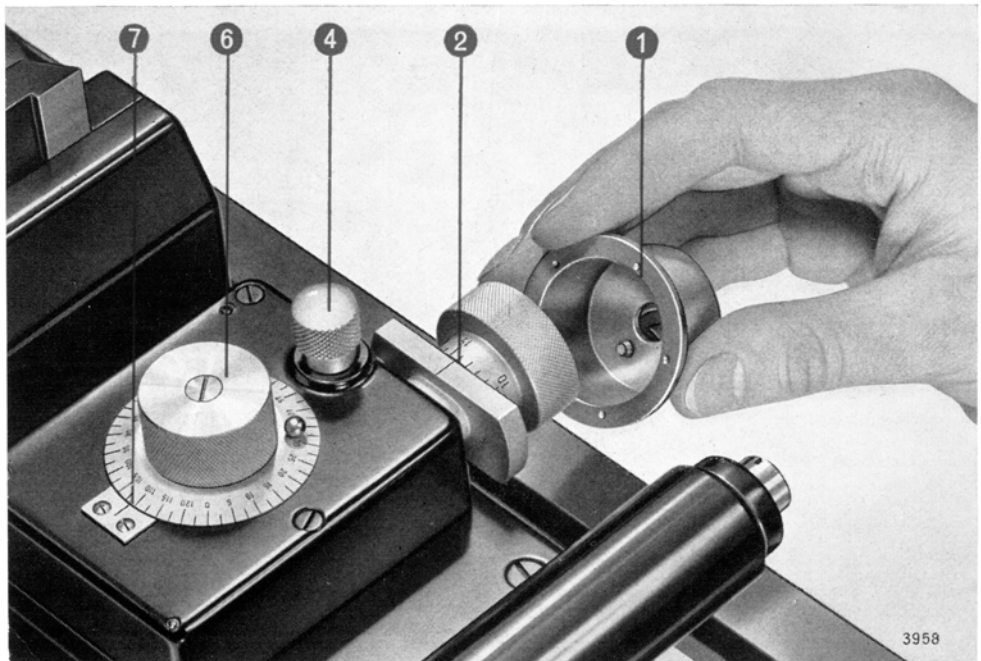


Fig. 1

addition the spindle (2) is scaled at intervals each corresponding to a rise in height of the object of 0.1 micron.

Other items of equipment for the No. 1300 base sledge microtome giving section thicknesses of 0.1 to 1 micron are:

Special glass knife holder designed to eliminate vibrations occurring during cutting. Glass knives should be used for section thickness of 0.1 to 0.8 micron (see page 6). Sturdy ball and socket clamp for holding the object block, which is best prepared in the customary manner using 0.5 c. c. gelatin capsules.

Adjustable auxiliary magnifier, 4 x magnification, for most exact setting of the object in front of the blade and for close observation of sections.

With the micrometer mechanism disengaged and the buffer stop pushed forward the automatic specimen feed of the base sledge microtome again goes into action.

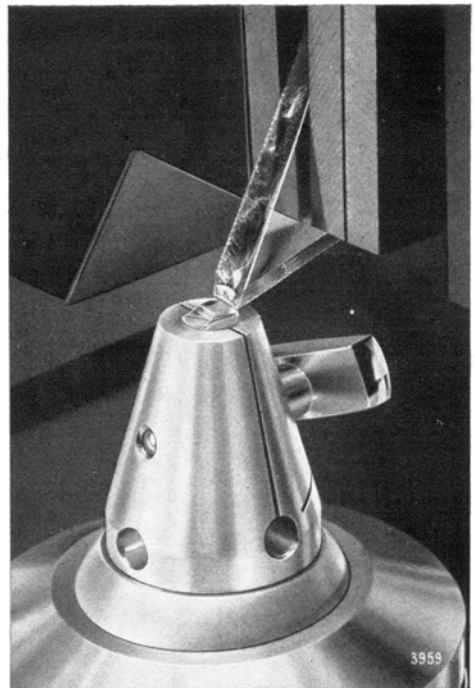
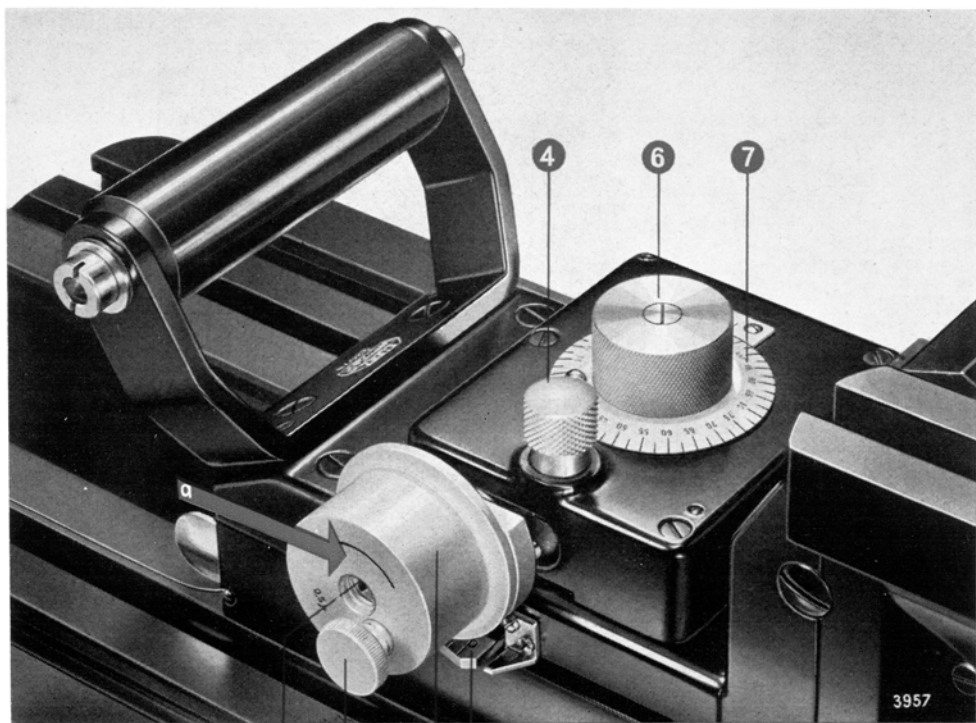


Fig. 2 Glass knife and holder,  
special clamp with specimen

## Operating Instructions

### Setting the microtome for thin sections using a glass knife

1. Secure glass knife holder to the two long knife rests as shown in illustration on page 1.
2. For automatic specimen feed unscrew buffer stop on left of microtome (not visible in illustration) and draw right back (towards the operator) out of the way.



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3. Attach special clamp.
4. Fine adjustment:  
Turn back the setting scale for the automatic specimen feed (5) beyond the figure "0" and screw in the upright clamping screw (4) as far as it will go. Push the micrometer adjustment (2) forward and move it gently from side to side until it engages. (The micrometer spindle is engaged when its movement is communicated to the graduated dial [7]). Turn back the clamping screw (4) until the micrometer spindle is arrested. Place the drum (1) for the object feed selected over the milled control head of the micrometer spindle (2). (The spindle is marked with a scale graduated at intervals of 0.1 micron to show the object height).
5. Secure glass knife (see fig. 2). The knife edge must point towards the operator and the lower edge of the diamond shaped piece of glass be inclined a few degrees towards the horizontal. The best angle for the knife should be established by tests.
6. Focus the magnifier on to the knife edge for observation of the cutting operation.
7. Use the magnifier to arrange the object block in the clamp in front of the knife. Then adjust the milled head (6) and the ball and socket joint of the object clamp so that the specimen just touches the knife edge without exerting any pressure. Raise the specimen by means of the micrometer spindle (2) at small intervals of not more than 5 microns, bringing it into contact with the knife so that the object block is gradually shaved away down to the required level. The microtome is then ready for cutting the specimen.
8. If it is desired to disconnect the micrometer mechanism again, the clamping screw (4) should first be turned clockwise as far as it will go, when the mechanism is released. The spindle (2) is then disengaged to the left, the clamping screw (4) loosened by giving it a few turns anticlockwise and the scale (5) for normal sections set to the required thickness. The buffer stop must be returned to its proper position.

When using the micrometer mechanism of the base sledge microtome special care should be taken to see that all clamping screws and holders for the knife and object are properly secured by hand and with the steel pins supplied. In addition all slides and working surfaces should be kept clean and oiled regularly.

## Making Glass Knives

The normal steel microtome knives cannot always be used for thin sections of 0.5 to 1 micron as the knife edges must be in absolutely satisfactory condition for such thicknesses. The best rake and inclination of the microtome knife can be of considerable importance in obtaining good results and should be established by the operator in each case.

When cutting thin sections it has been found preferable to use glass knives made from plate glass. These can be made by the operator himself from sheets of glass 5 to 10 mm. thick. The glass is marked into strips 30 to 40 mm. wide with a cutting diamond (fig. 4) and then broken off. Along these strips lines are scratched about 40 mm. apart at an angle of  $45^\circ$  and the glass strips broken off along these lines. Suitable knives are then selected from the resultant diamond shaped piece of glass (fig. 6). The knives should be smooth and uniform at the edge of the break. Experience shows that about 25% of all knives obtained in this way are suitable for cutting purposes.

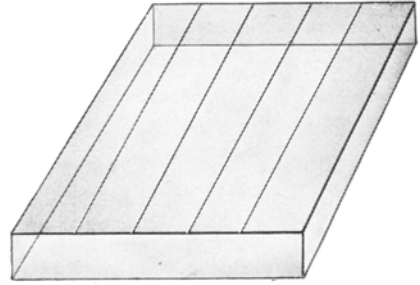


Fig. 4

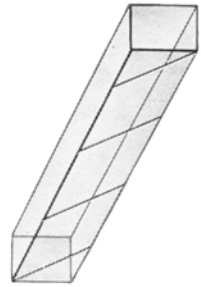


Fig. 5

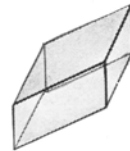


Fig. 6

## Care and Cleaning

The instrument should be cared for and cleaned in accordance with the instructions for use given in our brochure 53-6 on the base sledge microtome No. 1300. A small bottle containing a thin, non-acid oil is supplied with each microtome for lubrication of the guideways for the base sledge; sewing machine oil is the only suitable substitute for this oil. The base sledge should slide along its tracks smoothly and effortlessly and should not be pressed by hand against the guideway to maintain exact section thickness. The **object sledge** should be greased with white vaseline. For cleaning the microtome it is best to use benzine. After cleaning, all polished parts should be greased or oiled lightly as a protection against rust. The outfit should also be guarded against dust and covered over when not in use.

## Concluding Notes

The mechanical precision with which this instrument is made ensures accuracy of the figures relating to each micrometer adjustment drum. Even under careful working conditions, however, it is possible for deviations in section thickness of up to 0.1 micron to occur, due to fluctuations in room temperature or atmospheric humidity. Success in cutting sections will depend largely on proper fixing and embedding. It need hardly be added that only knives with satisfactory cutting edges should be used for such thin sections.

It is best to embed the specimen in one of the products used for this purpose in electron microscopy, for example methacrylates, Carbowax, Aquax etc.

## Complete Outfit

Base Sledge Microtome, No. 1300  
Special model for sections of 0.1 to  
20 microns, with micrometer mechanism  
for thin sections of 0.1 – 0.2 – 0.3 – 0.5  
and 0.8 micron;  
holder for glass knife, auxiliary magnifier,  
special ball and socket clamp . . . . MILAM

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