

April 16, 1968

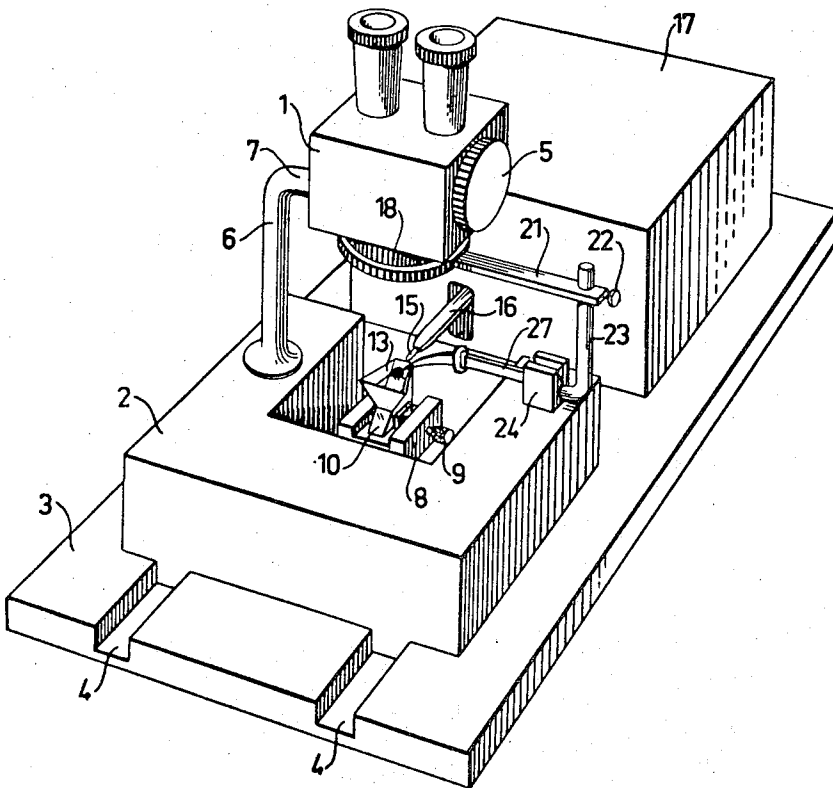
K. G. A. PERSSON
MICROTOME PROVIDED WITH MICROSCOPE AND SPECIMEN CATCHING
GRID OPERATED THEREBY

3,377,898

Filed March 21, 1966

3 Sheets-Sheet 1

Fig.1



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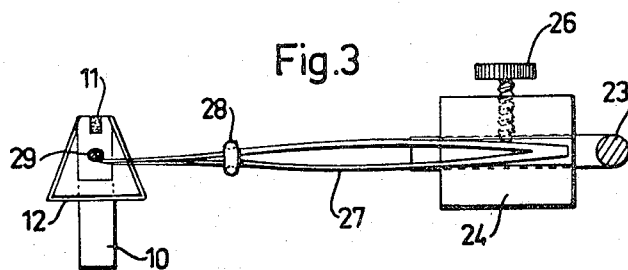
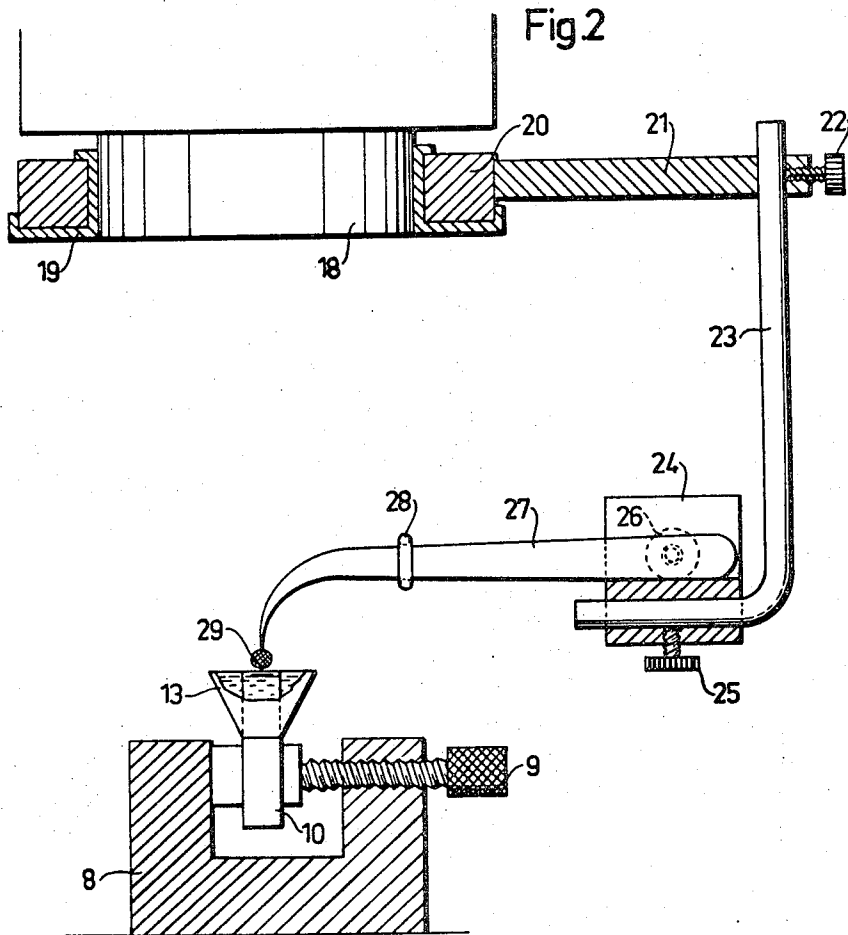
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Fig.4

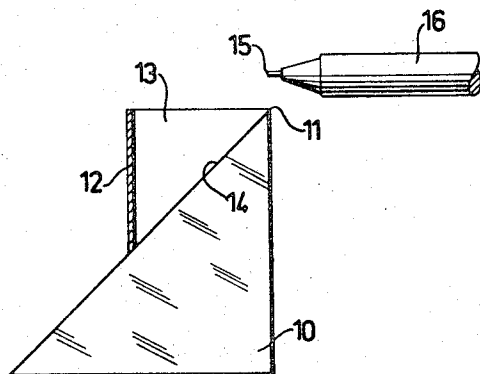
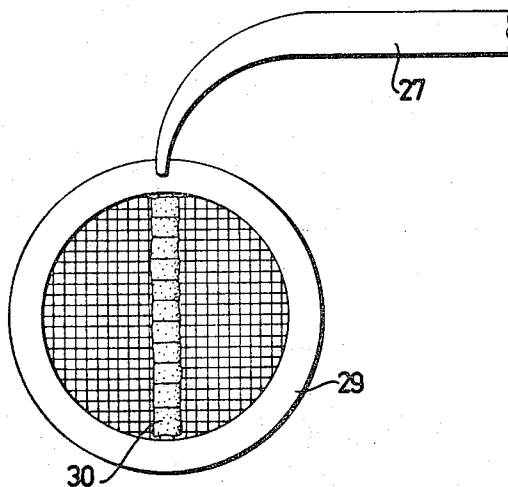


Fig.5



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MICROTOME PROVIDED WITH MICROSCOPE AND SPECIMEN CATCHING GRID OPERATED THEREBY

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1 Claim. (Cl. 83—78)

ABSTRACT OF THE DISCLOSURE

A microtome comprises a knife arranged to cut a specimen into thin sections, the sections falling into and being floated upon the surface of a liquid contained in a tray located adjacent the cutting point. A microscope having a three-dimensional movement is utilized for observing the knife edge and the floating sections, and a holder in the form of tweezers for releasably holding a grid used to catch and remove the floating sections, is secured to the objective of the microscope so that the holder, and hence also the grid, are manipulated simultaneously with manipulation of the microscope.

The invention relates to a microtome, that is an instrument for cutting a specimen into thin sections. In particular the invention relates to a microtome which produces sections of an extremely small thickness and size, for instance a thickness of down to 50 Angstrom units and a size of down to 0.01 mm.

In a microtome it is conventional technique to receive the cut sections on the surface of a liquid provided in a tray which is mounted close to the edge of the knife. The operator then catches the sections floating on the surface of the liquid by means of a small foraminous plate or grid. The grid and the section caught thereon is subsequently transmitted to examination in a microscope. For use in an electron microscope the grid has a convenient diameter of approximately 3 mm.

Because of the minute size of the grid and the section the process of catching the section on the surface of the liquid is conveniently controlled by the operator through a microscope, preferably a stereo microscope. In spite of this microscope the catching process is difficult and requires a trained operator. Any small shaking of the hand of the operator disturbs the process. It is the object of the invention to provide a microtome with a manipulator which allows the grid to be moved with a slow and quiet motion during the catching process, even with an untrained operator.

The microtome of the invention comprises a knife, means for moving a specimen so as to be cut into thin sections by the knife, a tray mounted close to the edge of the knife, to be filled with a liquid for receiving the sections floating on the surface of the liquid, a microscope for observing the edge of the knife and the sections floating on the surface of the liquid, means allowing a three-dimensional movement of the microscope, and a holder for releasably holding a grid for catching the sections floating on the surface of the liquid, said holder being fastened to the microscope so as to be operated by the movements of the microscope.

The invention will now be described with reference to the accompanying drawings. FIG. 1 shows a view of a microtome according to the invention. FIG. 2 shows the manipulator in a side view. FIG. 3 shows part of the

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manipulator in a top view. FIG. 4 shows the knife of the microtome and the tray for receiving the sections. FIG. 5 shows a grid and a section.

The apparatus illustrated in FIG. 1 contains a microscope 1 which is mounted upon a generally U-shaped support 2 which is slidable in grooves 4 on a base plate 3. The microscope is of the binocular type. It can be raised and lowered by means of a wheel 5. It is fastened to the horizontal portion 7 of a bent arm having its vertical portion 8 rotatably secured to the support 2. Consequently, movements in all three directions can be imparted to the microscope.

The base plate 3 also supports a knife holder 8 in which a knife 10 is fastened by a screw 9. The knife 10 consists of a triangular glass plate the upper edge 11 of which forms a sharp cutting edge. The knife 10 supports a tray consisting of a rear wall 12 and two side walls 13. The surface 14 of the knife forms the front wall of the tray. The walls 12 and 13 are secured to the knife by means of an adhesive.

The specimen 15 to be cut into sections by the knife 10 is fastened to a rod 16. The rod 16 is actuated by a mechanism, generally indicated at 17, for giving it an up and down movement and a feed towards the knife. This mechanism may be a conventional microtome mechanism. It does not form part of the invention and will not be described in detail.

An annular bearing 19 is fastened to the objective 18 of the microscope. The bearing supports an annular member 20 to which is secured a rod 21. This rod 21 supports, by means of a screw 22, a second rod 23. The lower end of this rod 23 supports, by means of a screw 25, a holder 24 for a pair of pincers or tweezers 27. The tweezers can be opened and closed by means of a member 28. The free end of the tweezers is situated in the optical axis of the microscope and carries a grid 29 for catching a section floating on the surface of the liquid.

In operation the manipulator 20-28 is adjusted so that the grid 29 is situated approximately in the focal plane of the microscope. The objective of the microscope is lowered so that the grid 29 partly dips into the liquid contained in the tray 12-13. By moving the microscope as described the operator moves the grid 29 towards the section to be caught. When a section 30 has been caught on the grid 29, see FIG. 5, the operator raises the microscope and releases the grid from the pincers 27 by means of the member 28.

What is claimed is:

1. A microtome, comprising a knife, means for moving a specimen so as to be cut into thin sections by the knife, a tray mounted close to the edge of the knife, to be filled with a liquid for receiving the sections floating on the surface of the liquid, a microscope for observing the edge of the knife and the sections floating on the surface of the liquid, means allowing a three-dimensional movement of the microscope, and a holder for releasably holding a grid for catching the sections floating on the surface of the liquid, said holder being fastened to the microscope so as to be operated by the movements of the microscope.

References Cited

UNITED STATES PATENTS

3,225,639 12/1965 Martinelli ----- 83—915.5
3,272,348 9/1966 Metz ----- 83—915.5

WILLIAM S. LAWSON, *Primary Examiner.*