(No Model.) 2 Sheets—Sheet 1.

E. BAUSCH.

MICROTOME.

No. 325,722. Patented Sept. 8, 1885.

Fig. 1.

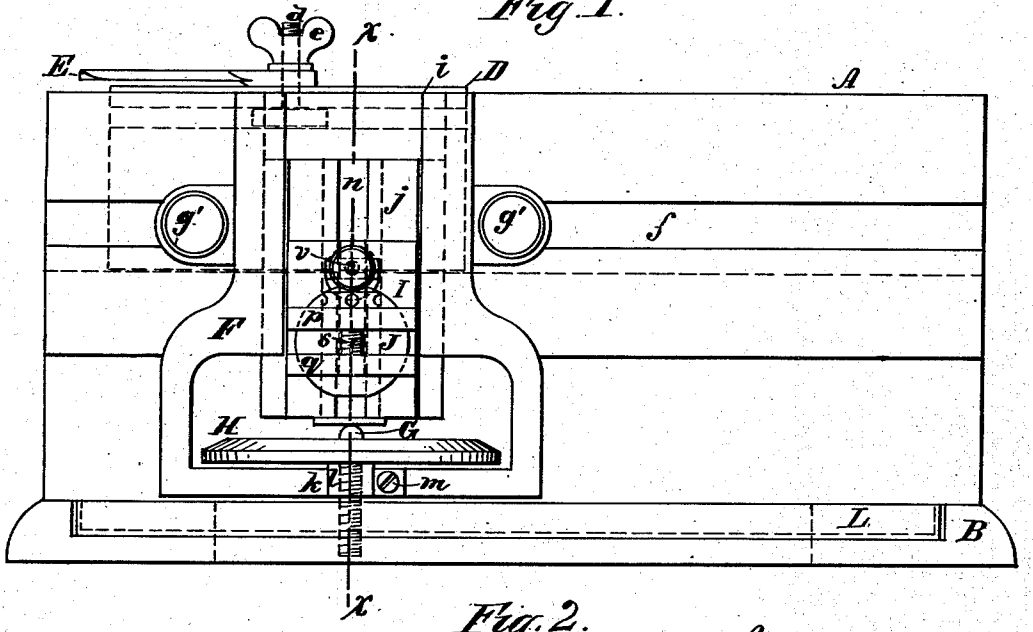
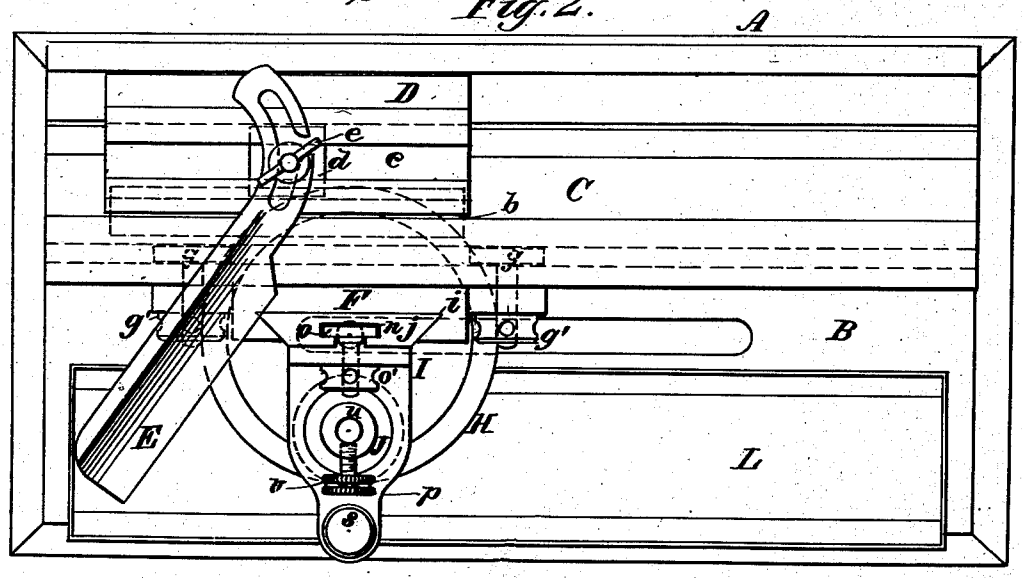


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

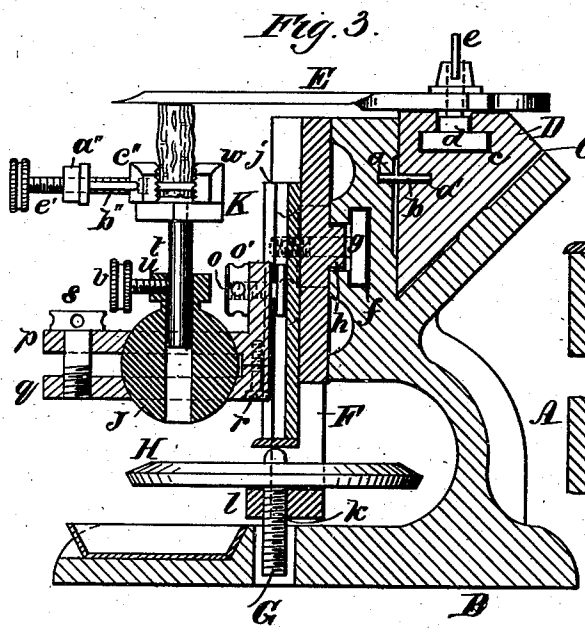


Fig. 8.

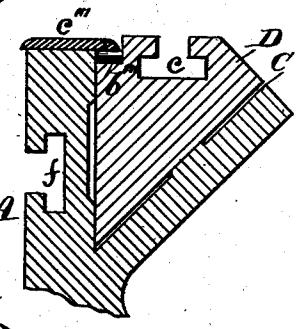


Fig. 6.

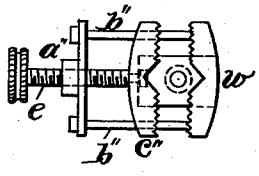


Fig. 4.

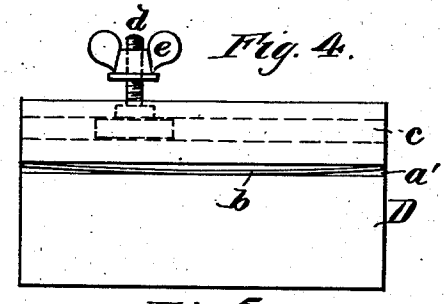


Fig. 7.

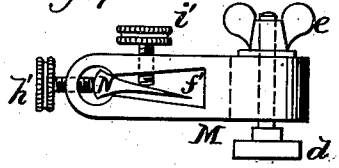
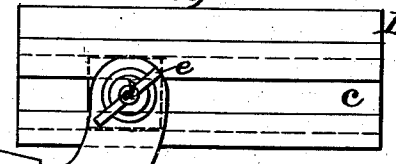
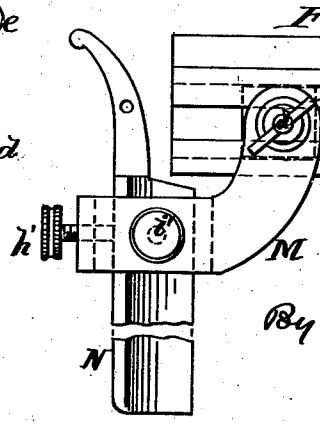


Fig. 5.





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UNITED STATES PATENT OFFICE.

EDWARD BAUSCH, OF ROCHESTER, NEW YORK.

MICROTOME.

SPECIFICATION forming part of Letters Patent No. 325,722, dated September 8, 1885.

Application filed April 17, 1885. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BAUSCH, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Microtomes, of which the following is a specification, reference being made to the annexed drawings, forming a part thereof, in which—

Figure 1 is a front elevation of my improved microtome. Fig. 2 is a plan view. Fig. 3 is a vertical section taken on line *x x* in Fig. 1. Fig. 4 is a side elevation of the knife-carrying slide. Fig. 5 is a plan view of the same. Fig. 6 is a plan view of the object-holding clamp; and Fig. 7 shows a clamp for holding an ordinary razor, the plan view of this device being also shown in connection with the slide in Fig. 5. Fig. 8 is a sectional view, showing a modification of the knife-carrying slide.

Similar letters of reference indicate the same parts in all the figures of the drawings.

The object of my invention is to provide a microtome capable of cutting sections at any desired angle, and with a knife placed at any angle with the object to be cut, and which will permit of ready adjustment, and will secure more perfect results than can be secured by the microtomes of ordinary construction.

My invention consists in a frame provided with a V-shaped guide and a slide adapted thereto for carrying a knife and retained therein by a spring-feather.

It also further consists in a ball-and-socket holder for the object-clamp, which admits of adjusting the object at any desired angle.

It also consists in means for adjusting the section-cutting knife and the object-holder, all as hereinafter more fully described.

The frame A of my improved microtome is provided with a base, B, cast integrally therewith, and with a V-shaped guide, C, formed on the back thereof for receiving the knife-carrying slide D. Along the vertical wall of the guide C is formed a groove, *a*, and in the knife-carrying slide D is formed a corresponding groove, *a'*, in which is secured a spring-feather, *b*, which is adapted to slide in the groove *a* in the frame A. The spring-feather *b* bears at the top and bottom of the groove *a* with a slight friction, which insures the smooth and steady motion of the knife-carrying slide D.

Instead of forming grooves in the slide D and in the frame A, and placing therein a spring-feather, I may secure a spring, *b'''*, to the top of the slide D, and attach a cap, *c'''*, to the top of the vertical part of the frame A, which will project partly over the V shaped guide in position to be engaged by the spring *b'''*, as represented in Fig. 8.

In the top of the knife-carrying slide D is formed a T-shaped slot, *c*, to which is fitted a T-headed bolt, *d*, whose screw-threaded shank projects upward through the slot beyond the upper face of the knife-carrying slide and receives a wing-nut, *e*, for binding the knife E to the knife-carrying slide D.

In the front of the vertical portion of the frame A is formed a longitudinal T-shaped slot, *f*, to which are fitted two T-headed bolts, *g*, which project outward beyond the face of the frame A and through a sliding frame, F, fitted to the vertical face of the frame A, and provided with a tongue, *h*, which projects into the narrower part of the T-shaped slot *f* and forms a guide for the frame F. A vertical dovetailed slot, *i*, is formed in the frame F, and to the said slot is fitted a slide, *j*, which carries the object-holder, and which is adjustable up and down in the slot *i* by a micrometer-screw, G, which is fitted to a threaded bearing, *k*, in the lower horizontal bar of the frame F.

The threaded bearing or nut *k* in which the micrometer-screw G turns is made in two parts, one being formed integrally with the frame F, the other part, *l*, being attached to the frame F by a screw, *m*, which permits of adjusting the threaded bearing *k* to always secure the proper bearing of the screw G therein. The screw G is provided with a beveled disk, H, which may be turned in the slot in the lower part of the frame F when it is desired to raise the slide *j* by means of the micrometer-screw G. In the front of the slide *j* is formed a T-shaped slot, *n*, to which is fitted a T-headed bolt, *o*, which projects at right angles through the slot and beyond the face of the slide *j* and receives a vertical slide, I, composed of the two arms *p q*, which are secured to each other by a screw, *r*, and provided with

a tongue fitted to the narrower part of the slot *n* in the slide *j*. The arms *p q* are apertured and adapted to receive between them the spherical clamp-support J, and a screw, *s*, passing through the upper arm, *p*, and into the lower arm, *q*, serves to securely clamp the spherical holder J in any desired position. The spherical clamp-holder J is bored axially to receive the shank *t* of the object-clamp K; and it is provided in its upper side with a flanged sleeve, *u*, in which is inserted a milled adjusting-screw, *v*, for clamping the shank *t* in position in the spherical holder J.

The object-clamp K is of the usual well-known description, consisting of a fixed jaw, *w*, a yoke, *a''*, connected with the fixed jaw *w* by rods *b''*, a movable jaw, *c'*, sliding on the rods *b''*, and adapted to be moved back and forth by the screw *e'*, which passes through the yoke *a''*.

The base of the frame A is slotted to permit of the longitudinal movement therein of the lower end of the micrometer-screw G. By means of this construction the frame F and parts attached thereto may be moved to any point along the length of the frame A, and fixed by means of the nuts *g'* of the bolts *g*, and the object-clamp and its support may be moved up or down on the slide *j*, after loosening the nut *o'* on the bolt *o*, when it may be secured by again tightening the said nut. By providing for the movement of the object-holding clamp to any point along the length of the bed-plate, and arranging the knife-carrying slide so that it may move along the entire length of the bed-plate, I am enabled to adjust the knife so as to make a cut at a very oblique angle from an object of considerable size.

The spherical clamp-holder J may be inclined at any desired angle within certain limits and securely held in any desired position by tightening the screw *s*. The object-clamp K may also be raised or lowered in the clamp-holder J, so that any desired position or angle of the object to be cut may be readily secured.

The section cutting knife E is provided with a curved shank having a corresponding slot, which is open in one side to receive the bolt *d*. This knife may be placed in any position along the length of the slide D, and it may also be clamped at any desired angle with the face of the frame A, so that the cut may be made at right angles with the object, or a long drawing cut may be made by inclining the knife more or less with the face of the frame A.

I have cut away the upper portion of the base in the front thereof to receive a trough, L, into which the objects cut by the knife E may fall.

By curving the back of the frame A to receive the disk H of the micrometer-screw G, I avoid slotting the frame, and thereby increase its strength and rigidity.

To adapt an ordinary razor for use in my improved microtome, I provide an auxiliary holder, M, consisting of an arm curved at one end and apertured to receive the bolt *d*, and having at the opposite end a horizontal mortise, *f'*, which is made circular at one end to receive the back of the razor-blade N, the opposite end of the mortise being of trapezoidal form to receive the cutting-edge of the razor and to admit of adjusting it at the proper angle with reference to the plane of its motion. In the extreme outer end of the arm M is placed a screw, *h'*, which enters the mortise and bears upon the back of the razor N, and in the top of the arm M is placed a screw, *i'*, which enters into the mortise and bears upon the upper side of the razor N. By means of these two screws the razor may be accurately adjusted at any desired angle, and may be securely clamped, so that it is possible for any one having my improved microtome to use an ordinary razor, which is comparatively inexpensive, in place of the expensive section-cutting knife commonly used for this purpose.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a microtome, the combination, with V-shaped guide and a V-shaped knife-carrying slide capable of sliding in the guide, of a spring adapted to hold the said V-shaped slide in the slot of the V-shaped guide, substantially as herein shown and described.

2. The combination, in a microtome, of a section-cutting knife, the knife-carrying slide provided with a T-shaped slot, a T-headed bolt adapted to clamp the section-cutting knife in any position along the length of the knife-carrying slide, and an object-holder adapted to support the object from which the sections are to be cut in the path of the section-cutting knife, as herein specified.

3. The combination, in a microtome, of a knife-carrying slide adapted to be slid the entire length of the main frame and an object-holder movable along the entire length of the frame, substantially as herein specified.

4. In a microtome, the combination, with the frame F and object-carrier and micrometer-screw carried thereby, of the frame A, having a slotted base and curved back to admit of moving the frame F and micrometer-screw along the frame A, as specified.

5. In a microtome, the combination, with the section-cutting knife and its slide, of a clamp arranged to support the object from which the section is to be cut, and a ball-and-socket holder for supporting the said object-clamp in any desired position, as specified.

6. The combination, with the vertically-adjustable slide *j*, of the arms *p q*, adjustable up and down on the said slide, the spherical holder J, and means for clamping the holder in any desired position, as specified.

7. The combination, in a microtome, of the

arms *p q*, screw *s*, axially-bored spherical holder J, adapted to be held by and between the said arms *p q*, the clamping-screw *v*, and the object-clamp K, as herein specified.

8. In a microtome, the combination, with the slide D, of a curved arm, M, provided with a mortise, *f'*, as herein described, and two screws, *h' i'*, entering into the mortise and adapted to clamp the back and side of a razor, as described.

EDWARD BAUSCH.

Witnesses:
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