



No. 658,611.

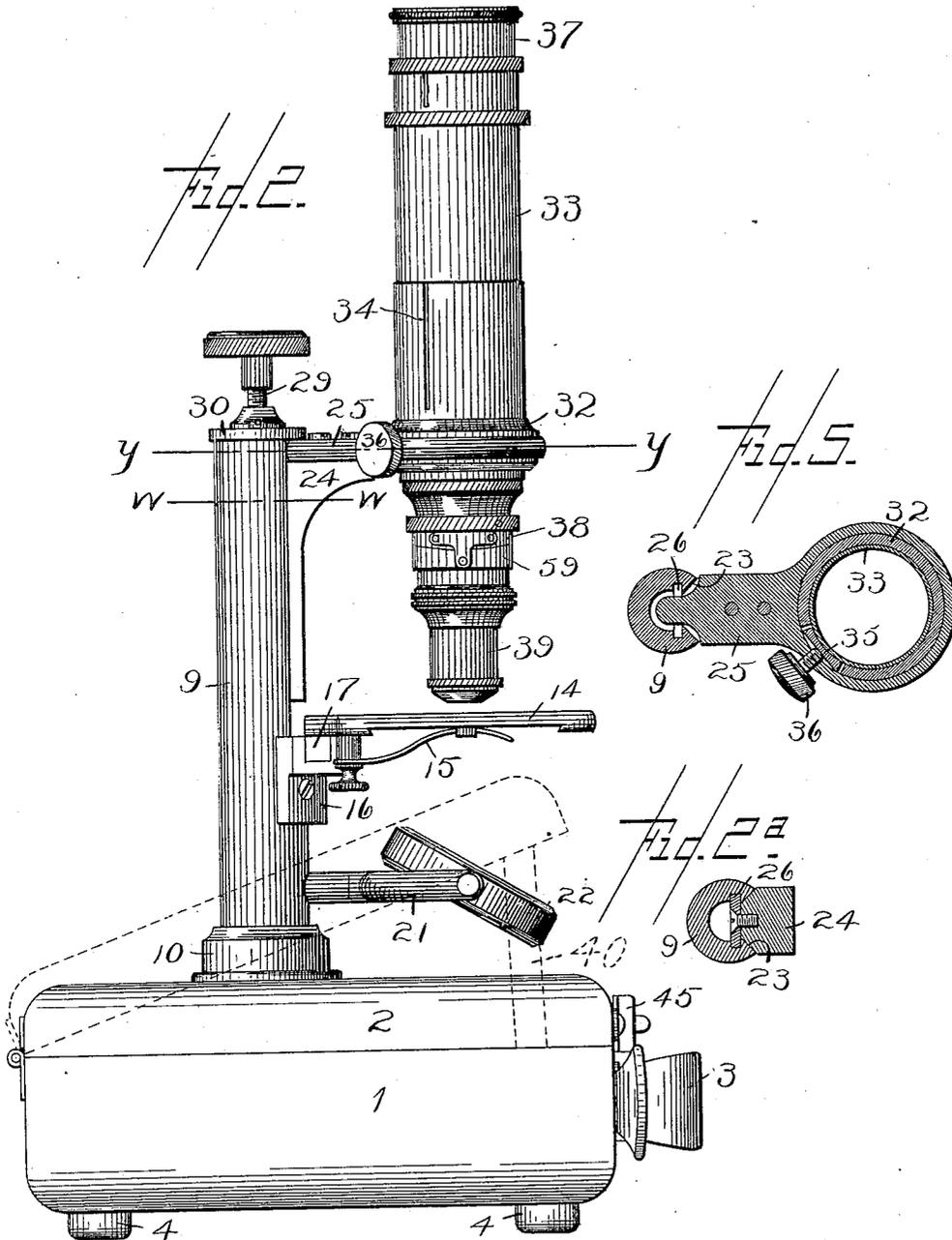
Patented Sept. 25, 1900.

E. BAUSCH.  
MICROSCOPE.

(Application filed Oct. 12, 1898.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses.  
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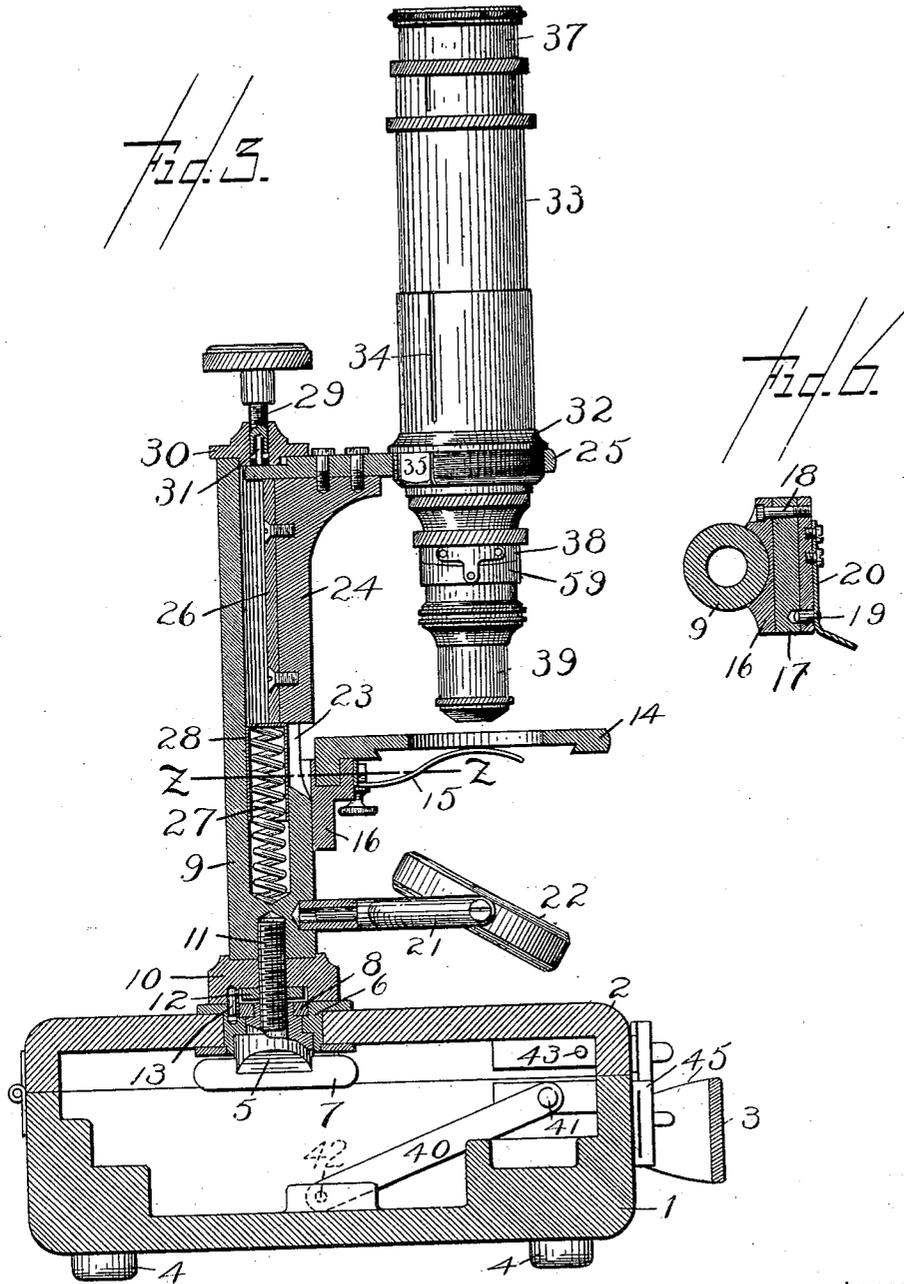
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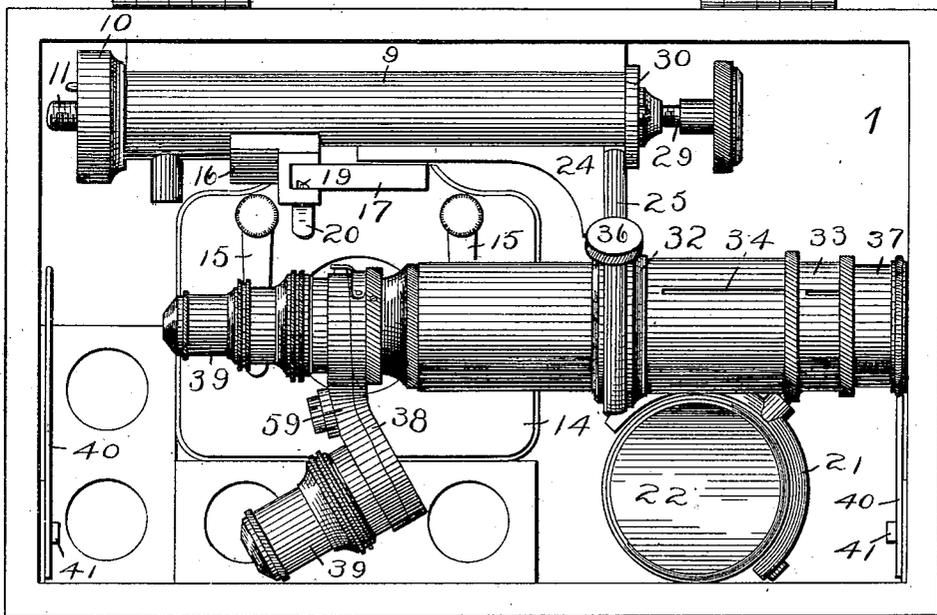
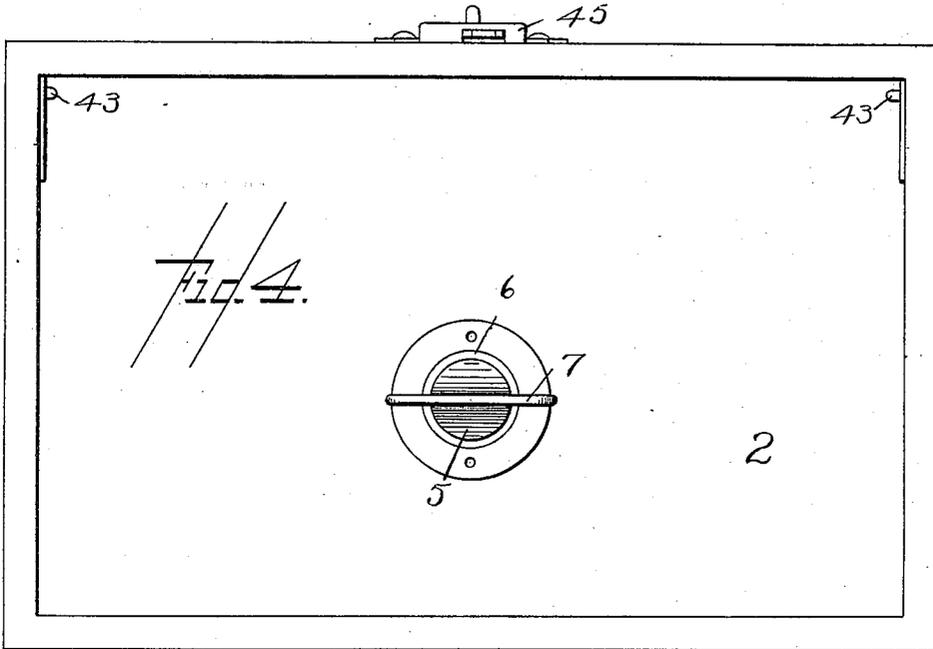
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# UNITED STATES PATENT OFFICE.

EDWARD BAUSCH, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE BAUSCH & LOMB OPTICAL COMPANY, OF SAME PLACE.

## MICROSCOPE.

SPECIFICATION forming part of Letters Patent No. 658,611, dated September 25, 1900.

Application filed October 12, 1898. Serial No. 693,333. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD BAUSCH, of Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Microscopes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

In the drawings, Figure 1 is a front elevation of a microscope constructed in accordance with my invention and the casing serving as a support or base. Fig. 2 is a side elevation of the same; Fig. 2<sup>a</sup>, a section on the line W W of Fig. 2; Fig. 3, a vertical sectional view on the line x x of Fig. 1; Fig. 4, a plan view of the instrument folded and packed in its case; Fig. 5, a horizontal sectional view taken on the line y y of Fig. 2; Fig. 6, a sectional view taken on the line z z of Fig. 3.

Similar reference-numerals in the several figures indicate similar parts.

At the present time the microscope has become such an aid, not to say a necessity, to physicians in diagnosing diseases, and particularly those caused or characterized by the presence of germs and bacilli in or abnormal conditions of the blood or secretions, that it is oftentimes very desirable to examine the secretions or blood fresh from the patient; but owing to the bulk of the ordinary microscopes now on the market it has been impractical for the physician to carry with him on his visits an instrument of sufficient power to permit a proper diagnosis to be made on the spot.

My present invention, therefore, has for one object the provision of an instrument which will enable a proper examination of blood and secretions to be had and one that is capable of being folded or collapsed into small compass and packed within a suitable carrying-case, so that the physician may without inconvenience carry with him and always have at hand the means of diagnosing rapidly and accurately those diseases and ills requiring prompt treatment.

The invention further has for its object to improve the construction and operation of

microscopes generally whether capable of being folded or not, all as will be hereinafter described, and the novel features pointed out particularly in the claims at the end of this specification.

In carrying out the first part of my invention I provide a suitable casing or receptacle (indicated by 1) having a hinged lid or cover 2 and of a depth about equal to the diameter of the tube or barrel of the microscope it is adapted to contain and of approximately the length of the tube, said casing being of suitable rigid material, as wood, covered with leather, if desired, and having a carrying-handle 3, sustaining-legs 4, of rubber or suitable soft material, and a lock or fastening device 45 for the lid. Arranged upon the lid or top of the receptacle is a suitable securing device for rigidly attaching the standard or pillar of the microscope to the casing, which latter is to serve as the base when it is desired to use the instrument, said securing device in the present embodiment consisting of a thumb-nut 5, swiveled to turn freely in a bushing 6, fastened in the lid 2 and provided on its lower end with the wings 7 and prevented from longitudinal movement by the collar or ring 8, as shown in Fig. 3. The pillar or standard 9 of the microscope is provided with the flange or foot 10 and a screw 11, having a set-nut 12 thereon and adapted to enter the nut 5, a steady-pin or dowel 13 being provided on the foot 10 of pillar to enter a corresponding socket in the bushing 6 and prevent rotary movement on the base.

14 indicates the stage of the microscope, having the usual aperture and preferably provided with the undercut groove in its lower side for the reception of slides or a substage and having also the spring-clips 15, said stage being hinged directly or indirectly to the pillar in such manner as to be folded or turned into a plane parallel with it when the instrument is to be folded and to be extended at right angles to the pillar in position for use and rigidly held. In the present instance I provide a bracket 16 upon the pillar, having a groove open at the upper side for the reception of a flange 17, formed on the rear edge of the stage and pivot the latter to said bracket by a pivot-pin 18, passing through

the flange, so that the stage may be turned up, as in dotted lines in Fig. 1, and when turned down, with the flange resting in the groove, it is secured by a catch or fastening device consisting of a pin 19 on the end of a spring 20, secured to the bracket and entering a suitable recess in the flange, as shown in Figs. 1 and 6.

21 indicates the yoke, removably pivoted on the standard and carrying the pivoted mirror 22.

The pillar is recessed longitudinally nearly its whole length and is provided at the front side with a longitudinal slot 23, having the inclined sides for the passage of the arm 24, to which the ring-plate 25 is secured, said arm having tapering surfaces cooperating with and sliding on the inclined sides of the slot, and the pillar is further provided with grooves at the rear side of the slot for the reception of the key-plate 26, secured to the rear of the arm 24, as shown in Figs. 2, 3, and 5.

27 indicates a spring located in the recess of the pillar and having at its upper end a cap or thimble 28, engaging the lower end of the arm and supporting the arm and connected parts and at the same time covering the lower portion of the slot 23. At the upper end of the arm is secured the ring-plate 25, having the rearward extension in the pillar and operated upon by the micrometer-screw 29, passing through the cap-plate 30, a loose pin 31 being arranged between said screw and plate, as usual in microscopes of this general description. The forward end of the ring-plate 25 is preferably provided with the screw-threaded aperture for the reception of the sleeve 32, adapted to receive and hold the tube 33, said sleeve 32 being slotted, as at 34, at its upper portion to form spring-fingers and also at its lower portion, where it passes through the ring-plate, to form a tongue or clamping member 35, having a flattened outer face and operated upon by a set-screw 36, passing through the ring-plate, as shown in Figs. 2, 4, and 5, operating to clamp the tube 33 rigidly in position and also to prevent rotation of the sleeve in the plate.

The tube 33 may be of any preferred construction, having the eyepiece 37 at the upper end and the nosepiece 38 at the lower end, the latter in the present instance having the two objectives 39 of different power on the plate 59 swiveled thereon, so that either may be brought in line with the eyepiece. The tube as a whole may be adjusted through the sleeve either for obtaining a coarse adjustment of the instrument or for collapsing it for placing in the casing, the spring-fingers on the sleeve affording sufficient friction to hold it, and it may be secured rigidly to the sleeve by the operation of the set-screw 36.

The fine adjustment for focusing is obtained, as usual, by the manipulation of the micrometer-screw.

If it is desirable or necessary to tilt the instrument, the lid of the casing may be turned upon the hinge to the position shown in dotted lines in Fig. 2 and supported by the links or arms 40, pivoted in the casing at 41 and having the apertures 42 in their free ends adapted to be engaged by the pins 43 in the lid. (See Fig. 3.)

When the microscope is in use, it is arranged and secured as shown in Figs. 1 to 3; but when desired to pack it in the casing for carrying it is only necessary to unscrew the thumb-nut 5, detaching the pillar from the casing, then fold the stage on its hinge parallel with the pillar, (this operation being permitted when the double objectives are employed by rotating their supporting-plate 59 on the pivot and without the necessity of withdrawing the tube from the sleeve,) and then moving the tube downward through the sleeve to the position shown in Fig. 4, when the parts may be conveniently placed in the casing and readily transported.

While the microscope as a whole is well adapted for the purpose intended, it will be understood that the same construction could be employed for instruments used with the ordinary stands or bases, the pillar being rigidly attached to it, and the folding stage would also be useful in instruments of the ordinary type to permit the use of substage appliances or others which can be more conveniently used when the stage is removed.

I claim as my invention—

1. The combination with a microscope or similar instrument having the projecting screw at the lower end of the pillar, of a containing-casing for the instrument having a lid, a nut-swiveled to turn freely in the lid of the casing having its upper end extending substantially flush with the upper surface thereof and operable from the inner side of the lid.

2. The combination with a microscope having the projecting screw and dowel on the lower end thereof, of a containing-case, a nut swiveled in the lid of the case and flush with the top thereof adapted to engage the screw and said lid having a recess for the dowel.

3. In a microscope, the combination with the pillar having the slotted bracket, of the stage pivoted at one side of the pillar and having the flange adapted to enter the slot in the bracket.

4. In a microscope, the combination with the pillar having the bracket thereon, of the stage pivoted on the bracket at one side of the pillar and adapted to be turned to fold parallel with the pillar and to be turned down at right angles thereto and to rest upon the bracket when in horizontal position, and a locking device for holding the stage when turned down.

5. In a microscope, the combination with the pillar having the longitudinally-extending recess, and the slot at the front having the bearing-surfaces on the front sides and

the keyway in rear thereof, of the arm carrying the tube at its forward portion and sliding on the bearings at the sides of the slot and the laterally-extending portions operating in the keyways, the spring on the recess operating upon the arm, and the adjusting-screw for operating the arm against the spring.

6. In a microscope, the combination with the pillar having the longitudinally-extending recess, the slot at the front, the ways in rear of the slot, the arm carrying the tube at its forward portion extending through the slot and the plate 26 on the arm engaging the ways, of the ring-plate, the tube thereon, the spring in the pillar beneath the arm, and the adjusting-screw for moving the arm against the tension of the spring.

7. In a microscope, the combination with the pillar having the longitudinally-extending recess and the slot, of the arm passing through the slot, the spring arranged in the lower portion of the recess and the thimble at the upper end of the spring engaging the arm and closing the slot in the pillar.

8. In a microscope, the combination with the pillar having the recess, and the slot at the front and the ways at the rear of the slot, the arm operating on the front edge of the slot, and the plate 26 thereon, of the ring-plate 25, the tube carried thereby, the cap 30, the screw 29 operating upon the ring-plate, and the spring in the pillar-recess beneath the arm.

9. In a microscope, the combination with the pillar and the ring-plate mediate supported thereon having the threaded aperture, of the sleeve screwing into the aperture, having the spring-fingers and a clamping mem-

ber, the lens-tube in the sleeve, and means engaging the clamping member to clamp the tube and also to prevent the movement of the sleeve in the plate.

10. In a microscope, the combination with the ring-plate having the threaded aperture the sleeve screwing into the aperture having the tongue 35 and the tube movable through the sleeve, of means on the plate engaging the tongue to prevent rotation of the sleeve and movable toward the tube to cause the tongue to bind thereon.

11. In a microscope, the combination with the ring-plate, the sleeve thereon having the spring-fingers and clamping member, the screw operating in the ring-plate and adapted to engage and move the member against the lens-tube and the lens-tube adjustable in the sleeve.

12. In a microscope, the combination with the ring-plate having the threaded aperture, the sleeve screwing in the aperture having the spring-fingers and the clamp member, the clamping-screw passing through the ring and engaging the clamp member and the lens-tube adjustable in the sleeve.

13. In a microscope, the combination with the pillar having the longitudinal recess and the slot at the front provided with inclined edges, of the arm engaging the edges of the slot, the key-plate in the recess, the spring beneath the arm, the cap-plate and the micrometer-screw therein operating upon the arm.

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Witnesses:

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