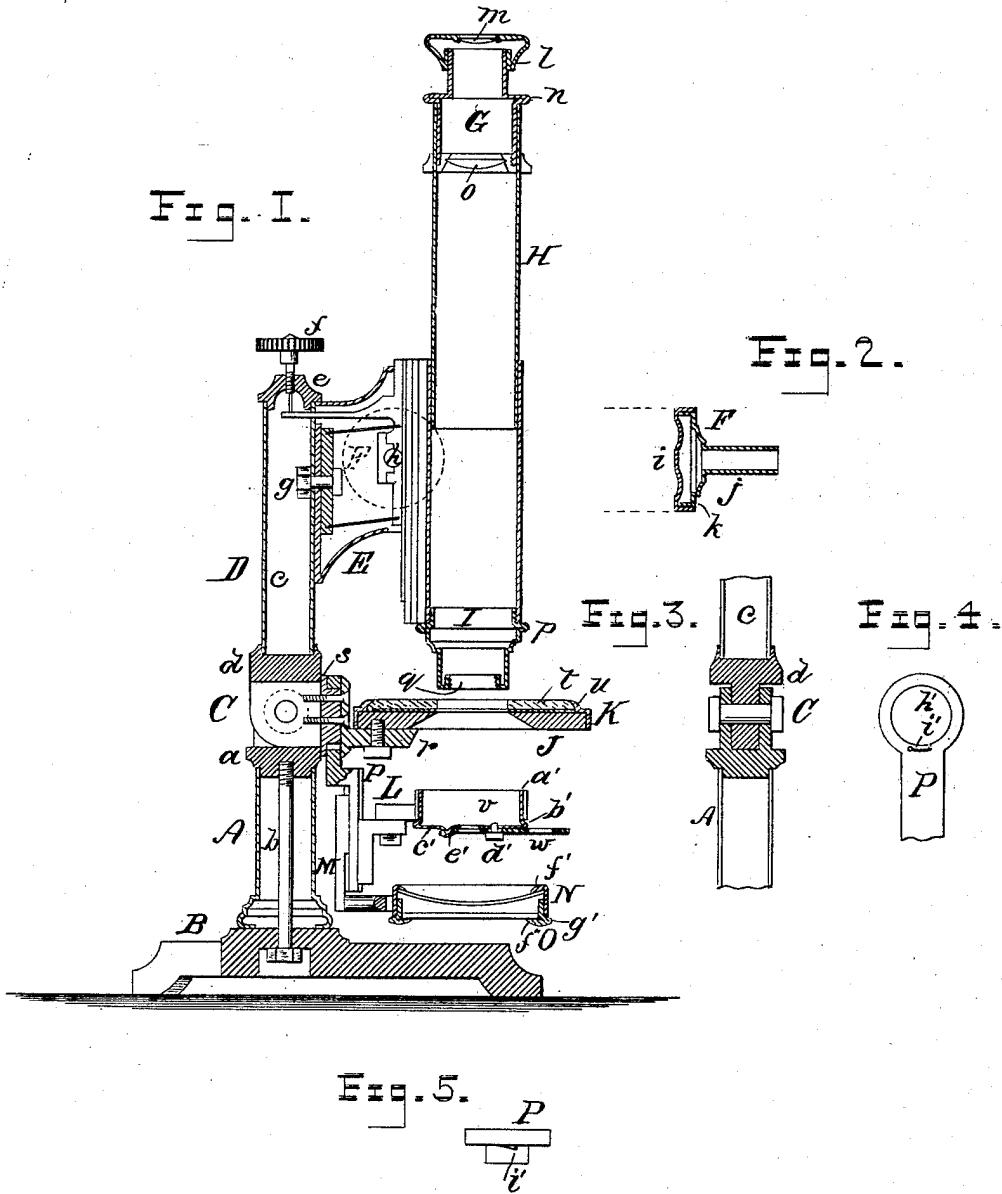


(No Model.)

E. BAUSCH.
MICROSCOPE.

No. 328,277.

Patented Oct. 13, 1885.



WITNESSES

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MICROSCOPE.

SPECIFICATION forming part of Letters Patent No. 328,277, dated October 13, 1885.

Application filed May 12, 1885. Serial No. 165,175. (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 Microscopes, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a vertical transverse section of the microscope embodying my improvements. Fig. 2 is a detail view of the hand-wheel for operating the focusing-pinion. Fig. 3 is a detail view of the joint of the arm. Fig. 4 is a detail view of part of the mirror-arm, and Fig. 5 is a plan view of the mirror arm.

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

The object of my invention is to reduce the expense of the construction of microscope-stands by the employment of sheet metal in various parts of the stand, the metal being spun or pressed into the various shapes required for the different parts and connected with other parts, so as to form a complete and substantial stand.

In addition to the advantage of low cost I am able by this construction to bring the center of gravity of the instrument low down toward the foot or base of the stand, so that increased stability is secured.

The pillar A, which is attached to the base B, consists of a sheet-metal shell or tube spun or pressed into the desired shape and fitted to the part *a* of the hinge C, and secured by a bolt, *b*, passing upward through the base B into the part *a*, or by brazing the part *a* to the tube A, or by inserting the tube A in a mold and casting the part *a* thereon. Where two pillars are required, both will be made in this way.

The arm D, which is hinged to the pillar A, consists of a tube, *c*, secured to the part *d* of the hinge C by brazing or soldering, or in any other convenient and effective way, and the upper end of the tube *c* is closed by a cap, *e*, carrying the micrometer-screw *f*.

The casing E, which contains the focusing mechanism of the microscope is secured to the side of the tube *c* by a bolt, *g*, or in any other convenient and effective way. As the focus-

ing mechanism of this microscope is now well known and in extensive use it will require no description here; but the spindle *h*, which carries the pinion of the focusing mechanism is provided at one or both ends with a wheel, F, (shown in Fig. 2,) formed of two parts, *i j*, spun or stamped from sheet metal, the part *j* having a sleeve formed thereon to receive the spindle *h*, and provided with a flange having a collar, *k*, over which the part *i* is secured, completing the wheel. The edge of the wheel is milled in the usual way.

The tube G, forming the body of the eyepiece in the microscope, is formed of sheet metal spun or stamped, with two diameters, the larger being fitted to the microscope-tube H, and the smaller one being adapted to receive the eye-lens cap *l*, which is also spun or stamped from sheet metal and adapted to hold the eye-lens *m*. The body-piece G is provided with a flange, *n*, formed by spinning or pressing the metal of which the body is formed. The field-lens *o* is fitted to a ring, which is screwed into the larger end of the body G.

The nose-piece I, which is fitted to the lower end of the tube H, is also formed of sheet metal stamped or spun into shape and screwed into the lower end of the tube H, or secured in any other convenient way, the nose-piece being provided with a collar, *p*, formed in spinning or stamping, and having an internal collar, *q*, formed by returning the metal upon itself or bending it inward parallel to the outer walls of the nose-piece. The inner surface of the collar *q* is threaded internally to receive the microscope objective.

The stage J of the microscope is secured to a bracket, *r*, which is fastened to the part *d* of the hinge C by means of two screws, which also pass through an intervening boss, *s*, which forms the bearing for the sub-stage arm.

To the stage J is fitted a holder, K, for receiving and holding the glass secondary stage *t*. The holder K is formed of a centrally-apertured cap fitted over the stage J and provided with a rim, *u*, on its upper surface which incloses the edges of the glass stage *t*. The sub-stage L and mirror-arm M are connected with the stand in the usual way; but the adapter *v*, which carries the diaphragm *w*, is formed of one piece

of sheet metal, and consists of a rim, *a'*, fitted to the ring of the sub-stage and provided with a flange, *b'*, and a centrally-apertured bottom part, *c'*, which supports a pivot, *d'*, of the revolving diaphragm *w*, and is provided with a stop, *e'*, formed by forcing out a small part of the metal beyond the lower surface of the bottom part, *c'*, and the diaphragm *w* is provided with indentations adapted to receive the stop *e'* and cause the apertures of the diaphragm *w* to register with the central aperture of the adapter *v*.

The frame for holding the plane and concave mirrors of the microscope consists of two rings, N O, formed of sheet metal by stamping or spinning, the ring N being provided with an internal flange, *f'*, and the ring O being provided with an internal flange, *f''*, and with an external flange, *g'*, the ring O being adapted to fit into the ring N with a flange, *g*, resting against the edge of the ring.

The sub-stage bar P is provided with an eye, *h'*, which turns on a boss, *s*, in the side of which is formed a spring, *i'*, by sawing into the metal forming the arm, and this spring is bent outward, as shown in Fig. 5, to cause it to bear against the collar of the boss *s* and produce sufficient friction to hold the mirror and sub-stage in any position in which it may be placed.

The construction of the different parts of the microscope in the manner described and of the material named enables me to produce a microscope with superior finish and having its center of gravity very low, and having its weight reduced to a minimum without in any way affecting its stability.

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

1. The combination, with the focusing-spindle *h* of a microscope, of a hand-wheel, F, formed of two parts, *i j*, spun or stamped from sheet metal and fitted to each other, the part *j* having formed integrally therewith a sleeve adapted to receive the focusing-spindle *h*, substantially as shown and described. 45

2. An eye-piece body, G, composed of sheet metal spun or stamped into shape and provided with a flange or shoulder, *n*, formed by folding the material of the eye-piece body upon itself and in the combination therewith of a cap, *l*, fitted to the end of the body and arranged to hold the eye-lens, substantially as herein shown and described. 55

3. A nose-piece formed of sheet metal and provided with a flange, *p*, and the internal collar, *q*, substantially as herein shown and described.

4. In a microscope partly formed of sheet metal, a sheet-metal glass-stage holder, K, adapted to the microscope-stage J, and provided with a rim, *n*, for receiving the glass stage *t*, as herein specified. 65

5. The sub-stage adapter *v*, stamped or spun from sheet metal and provided with a stop, *e'*, in combination with the diaphragm *w*, having indentations adapted to receive the stop *e'*, as herein specified. 65

6. A mirror-bar, P, having formed thereon a spring, *i'*, bent laterally, as shown, in combination with the boss *s*, for supporting the same, as herein specified. 70

EDWARD BAUSCH.

Witnesses:

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GEORGE HIMMEL.