(No Model.)

W. H. BULLOCH.

OBJECTIVE ATTACHMENT IN MICROSCOPES.

No. 287,904. Patented Nov. 6, 1883.

Fig. 1.

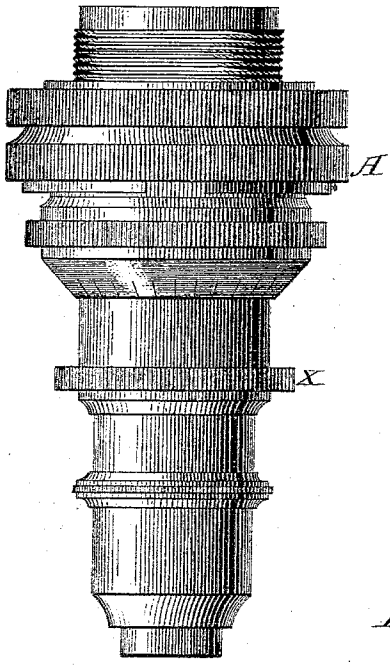


Fig. 5.

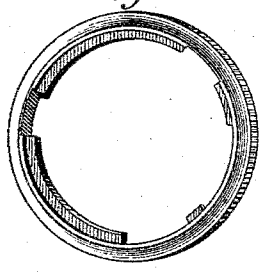


Fig. 2.

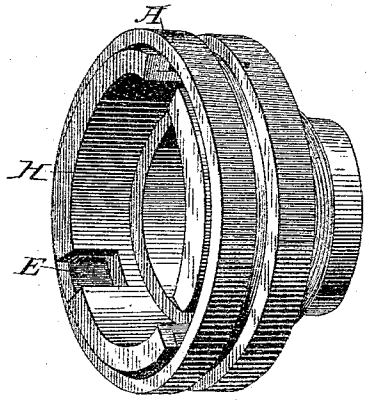


Fig. 3.

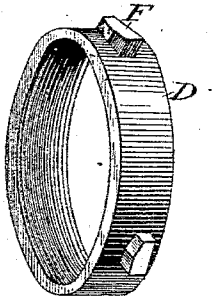
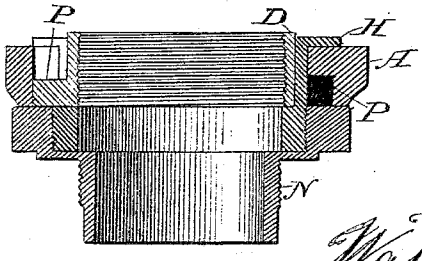


Fig. 4.



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UNITED STATES PATENT OFFICE.

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OBJECTIVE ATTACHMENT IN MICROSCOPES.

SPECIFICATION forming part of Letters Patent No. 287,904, dated November 6, 1883.

Application filed September 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, WALTER H. BULLOCH, of the city of Chicago, Cook county, Illinois, have invented a new and useful Improvement in Microscopes, of which the following is a specification.

In using the microscope it is found advantageous to have some rapid means of attaching and detaching the objective or object lens with its mounting, to substitute a lens of one power for one of higher or lower. The attachment must be made in such a manner that the part cannot be easily disarranged by manipulating with the instrument, but capable of easy disconnection when required. For this purpose I have devised the attachment shown in the accompanying drawings, in which—

Figure 1 shows a perspective view of the lens mounting and attachment complete; Fig. 2, a perspective view of the upper portion of the device; Fig. 3, a perspective view of the lower portion of the device; Fig. 4, a vertical section of complete device inverted; Fig. 5, ring A shown in perspective.

The part Fig. 3 consists of a collar or ring, D, made to fit securely, by screw or otherwise, the upper end of an objective, and form with it substantially one piece. This ring has on its outside one or more projections, spurs, or catches, as shown at F. The ring D is formed to fit in the flanged piece H, which is provided with radial slots or cavities E. These are somewhat deeper than the thickness of the spurs F. The part H is inclosed by an outer ring, A, (shown in perspective by Fig. 5,) and consisting of a ring having flanges on its inner portion. This flange is cut away to admit of the spurs F of the ring D, and is constructed to retain the spurs F of the ring D when such ring is properly inserted in the piece H, and the ring A turned to the right or left, it being fitted so that it can freely turn, and the angular movement limited, if desired, by any convenient stop.

In using the device, which can either be part of the usual portion of the microscope-body or a separate attachment fitted by the part N, in the usual manner, to the nose-piece of the microscope—that is, by an outside threaded screw—the ring D has an inner threaded space, into which the objective is fitted. The objective, with its spurs, is now placed in the cavity of the ring H, the uncut part of the flange or spurs of the ring A having been so adjusted that the spurs F can enter them. If the ring A is turned, its projecting spurs will close the cavity where the spurs F entered and secure the ring D with the objective in its desired place.

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

1. The inner ring, D, with outward-projecting spurs, middle ring, H, with spur-cavities, and outer ring, A, with inward-projecting spurs, substantially as herein shown and described.

2. In combination with the objective of a microscope, the spurs F and rings H and A, the former fitted and adjusted to fit in and be secured by the latter, substantially as and for the purpose described.

WALTER H. BULLOCH.

Witnesses:

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