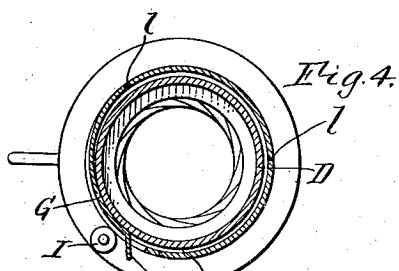
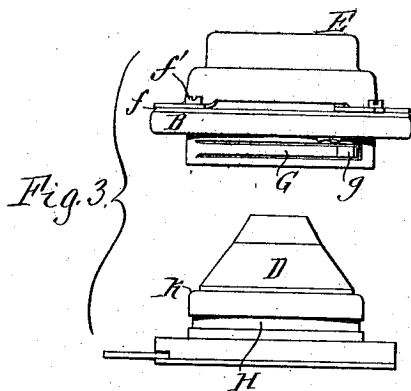
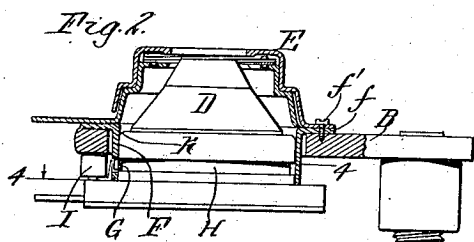
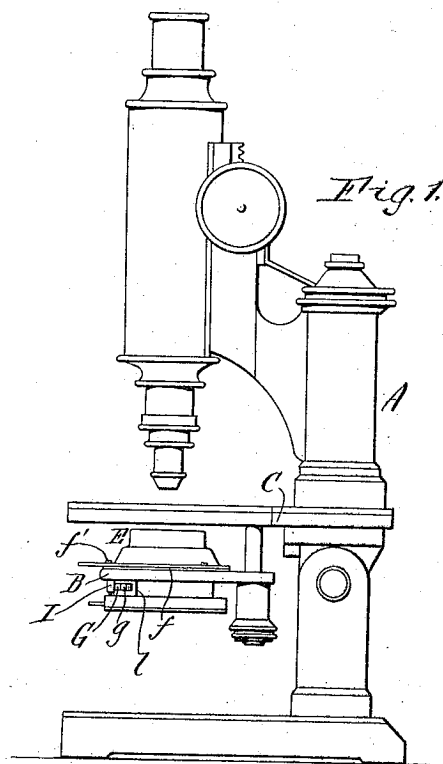


H. N. OTT.  
 MICROSCOPE.  
 APPLICATION FILED SEPT. 12, 1914.

1,223,197.

Patented Apr. 17, 1917.



Witnesses: g H  
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# UNITED STATES PATENT OFFICE.

HARVEY N. OTT, OF BUFFALO, NEW YORK, ASSIGNOR TO SPENCER LENS COMPANY, OF  
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## MICROSCOPE.

1,223,197.

Specification of Letters Patent.

Patented Apr. 17, 1917.

Application filed September 12, 1914. Serial No. 861,386.

### *To all whom it may concern:*

Be it known that I, HARVEY N. OTT, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Microscopes, of which the following is a specification.

This invention relates more particularly to means for removably securing a condenser or other similarly placed removable substage appliance of a microscope in place on the substage or support therefor.

In microscopes as commonly constructed, the condenser is removably held beneath the stage on a support or substage, this support being provided with a split ring in which the condenser is removably retained by frictional engagement with the ring, and into and out of which the condenser is adapted to be slipped from below. Other removable substage appliances are also adapted to be similarly held in this retaining ring. This construction is desirable in that the condenser or other appliance can be readily placed in position and removed, and can be turned to any desired angle of azimuth on the substage, but it is objectionable since the condenser or other appliance, being held in place only by friction, is apt to, and frequently does, work loose and drop out of the retaining ring; thus causing much annoyance in the use of the instrument.

The object of this invention is to provide a microscope with desirable and inexpensive securing means for the condenser or other removable appliance, which will positively and securely hold the condenser or appliance in place and enable it to be quickly and easily placed in position and removed, and turned to any desired angle on the support.

In the accompanying drawings:

Figure 1 is a side elevation, on a reduced scale, of a microscope provided with means embodying the invention for securing a condenser or other removable appliance in place.

Fig. 2 is a sectional elevation of the substage and appliances carried thereby.

Fig. 3 is an elevation of the substage with the condenser removed and below the same.

Fig. 4 is a sectional plan view in line 4-4, Fig. 2.

A, Fig. 1 represents a microscope stand of ordinary construction provided with the usual substage or support B on which the

condenser and other usual substage appliances are supported below the stage C. D represents the condenser, which, as usual, is removably retained beneath the upper iris diaphragm E in a ring F on the substage or support B. This ring can be, as shown in the drawings, a separate ring secured by a flange *f* and screws *f'* on the substage and depending through an opening in the substage, or it can be secured on or formed with the substage or support in any suitable way. The condenser is adapted to be inserted into and removed from this retaining ring from below in the usual way.

The retaining ring F is provided with a spring catch G which is adapted to engage a shoulder or part on the periphery of the shell or casing of the condenser to secure the condenser in the ring. The catch G, shown, is formed by slitting the ring F circumferentially at one side and bending the spring tongue or strip thus formed so that it is adapted to project into a circumferential groove H in the shell or casing of the condenser or appliance D and thereby secure the condenser or appliance in the ring. A circumferential groove H is preferably provided in the condenser or appliance D for the engagement of the spring catch, as this permits the condenser or appliance to be turned to any desired position in the ring and to be placed in the ring without having to be first turned to a particular position for inserting it. The condenser or appliance could, however, be provided with one or more shoulders or parts of any suitable sort for the engagement of the catch.

The free end of the spring tongue G is bent outwardly to form a handle *g* for releasing the catch when removing the condenser or appliance D from the ring F, and a stop I of any suitable sort is preferably provided on the substage or support B to prevent the tongue from being bent outwardly far enough to render it inoperative. The catch can also be manipulated by this handle when inserting the condenser or appliance D, if desired, but this is not necessary, since the condenser can be inserted without independently manipulating the catch by tilting the condenser to a slight inclination when inserting it. A beveled or rounded shoulder *k* on the condenser above the catch groove H and adapted to engage the lower edge of the catch and force it

outwardly, also enables the condenser to be shoved up into place in the retaining ring without independently actuating the catch. An obvious reversal of this would be to bevel the lower edge of the spring tongue G.

Preferably the retaining ring is split as usual, and, as shown at *h*, to adapt it to contract upon and frictionally hold the condenser or appliance D so that the condenser or appliance will be held more firmly in the ring and retained by friction in any angular position to which it may be turned in the ring F.

The construction described provides a securing device by which the removable condenser or appliance is positively secured in place on its support without necessitating any additional part on the instrument and without appreciably increasing the cost of manufacture of the instrument.

I claim as my invention:

1. In a microscope, the combination of a substage provided with an opening for a retaining ring in said opening, a substage appliance adapted to be inserted upwardly into and removed from said retaining ring, and a spring catch on one of said parts and adapted to spring into engagement with a shoulder extending circumferentially around the other part for positively but releasably securing said appliance in said retaining ring and permitting rotary adjustment of the appliance in the ring.

2. In a microscope, the combination of a substage provided with an opening for a substage appliance and with a retaining ring substantially concentric with said opening, a substage appliance adapted to be inserted upwardly into and removed from said retaining ring, and a spring catch on said retaining ring adapted to engage a circumferential shoulder on said appliance for releasably securing said appliance in said retaining ring.

3. In a microscope, the combination of a

substage provided with an opening for a removable substage appliance and with a retaining ring, and a substage appliance adapted to be inserted upwardly into and removed from said retaining ring, said retaining ring having a spring tongue formed by an integral portion of the circumferential wall of said ring and extending circumferentially thereof and adapted to engage a circumferential shoulder on said appliance for releasably securing said appliance in said retaining ring.

4. In a microscope, the combination of a substage provided with an opening for a removable substage appliance and with a retaining ring in said opening, and a substage appliance adapted to be inserted upwardly into and removed from said retaining ring, said retaining ring having an integral spring tongue extending circumferentially thereof and adapted to engage a circumferential shoulder on said appliance for releasably securing said appliance in said retaining ring, said spring tongue being provided with an outwardly bent end portion for manipulating it.

5. In a microscope, the combination of a substage provided with an opening for a substage appliance and with an expansible retaining ring for said appliance, a substage appliance adapted to be inserted upwardly into said retaining ring, and a spring catch on said retaining ring adapted to engage a circumferential shoulder on said appliance for releasably retaining said appliance in said retaining ring, said catch permitting said appliance to be turned to different positions in said retaining ring, and said retaining ring acting by frictional engagement with said appliance to hold it in the position to which it is turned.

Witness my hand, this 11th day of September, 1914.

HARVEY N. OTT.

Witnesses:

C. M. ASH,  
L. M. POTTER.