(No Model.)

F. W. GARDAM.

MICROSCOPE.

No. 580,522. Patented Apr. 13, 1897.

Fig. 1

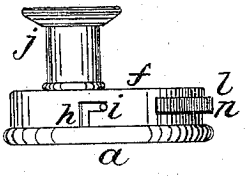


Fig. 4

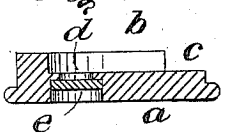


Fig. 6

Fig. 5

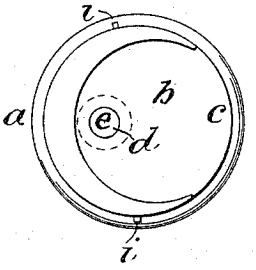


Fig. 2

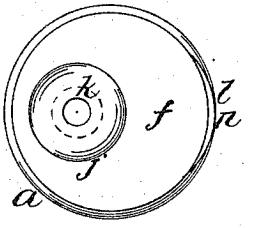


Fig. 7

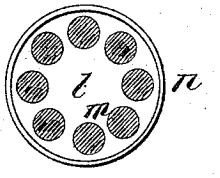
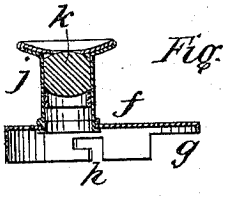


Fig. 3



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MICROSCOPE.

SPECIFICATION forming part of Letters Patent No. 580,522, dated April 13, 1897.

Application filed November 8, 1894. Serial No. 528,223. (No model.) Patented in France January 15, 1894, No. 235,518, and in Spain January 20, 1894, No. 15,183.

To all whom it may concern:

Be it known that I, FREDERICK W. GARDAM, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Microscopes, (patented to me in France January 15, 1894, No. 235,518, and in Spain January 20, 1894, No. 15,183,) of which the following is a specification.

This invention relates to microscopes designed for use in viewing microscopic pictures, and embodies improvements in that class of instruments shown and described in United States Letters Patent No. 513,912, granted to me the 30th day of January, 1894, and it also relates to an improvement in the glass disks upon which the microscopic pictures are photographically produced.

The object of the invention is to make an instrument of this character that shall be small and compact, so as to be portable, that can be easily opened to admit of the ready interchange of object-disks, and that shall be neat in appearance, always in condition for use, and easy to manipulate. To this end the case is made narrow and preferably circular, on the cover of which is formed or attached the lens-tube, extending from the flat top and near the edge thereof, and the bottom or lower part is provided with a circular recess, a part of the periphery of which, but less than one-half, is broken away or opens out through the side of this bottom piece, so that a portion of the edge of the object-disk which is held in this recess will project beyond the case to enable the disk to be rotated. This bottom piece has an opening formed in it that alines with the lens, and this opening is covered by a piece of translucent glass. The improvement in the glass disk on which the pictures are photographed and protected by a suitable varnish consists in binding its edge with a band of thin metal or other suitable material lapping slightly over the flat surfaces, thus strengthening the glass and preventing abrasion of the varnish and photograph-film when the disk is rotated in the holding-case.

The accompanying drawings represent in detail my improvements in microscopes, and to which I will now refer.

Figure 1 is a side view of my improved microscope complete. Fig. 2 is a plan view of the same. Fig. 3 is a central vertical section of the cover of the case and lens. Fig. 4 is a central vertical section of the lower part of the case. Fig. 5 is a plan view of this part. Fig. 6 is a sectional view of the object-disk, and Fig. 7 is a plan of the disk.

The case is shown circular in form, but it may be made of any desired shape. The bottom or lower part a has a circular recess b in its upper surface eccentrically located and of such a diameter that a portion of its periphery, but less than one-half thereof, cuts through and forms an opening c in the side of the part a. Through the bottom of this recess b, near its periphery, opposite the opening c, is formed the hole d, which is covered by the piece of suitable translucent material e, as ground glass, which is seated in a recess formed in the under side of the bottom a. I prefer to make this piece a solid, as shown, from a suitable natural material or artificial composition. It may be made of sheet metal.

The top or cover f is of sheet metal, formed to fit snugly over the edge of the bottom a, the circular flange being cut away, as shown at g, Fig. 3, corresponding to the opening c through the side of the bottom a, and bayonet-slots h are also formed in this flange, adapted to catch over the pins $i\,i$, which project from the side of the bottom a as a means for locking the two parts together. Any other suitable locking device may be used. Projecting from the upper side of the cover f is the lens-tube j, which holds the magnifying-lens k, and this tube and lens are so arranged that the lens is in alinement with the hole d in the bottom a when the parts a and f are placed together for use.

The transparent disk l is preferably formed of glass, and has produced on its surface a series of microscopic pictures or other matter m, circularly arranged and so located thereon that when the disk is placed in the recess b these objects m may be successively brought over the hole d. The edge of the disk when so placed extends through the opening c.

This disk *l* is strengthened and protected from fracture by the binding *n*, which may be of metal or any other suitable material, formed to cover the periphery of the disk and also to extend over its surfaces, as shown, so that the surfaces of the disk and the picture-films are held clear of the case, thus avoiding abrasion when the disk is rotated. The edge of this binding *n* may be roughened or corrugated, as shown at Fig. 1, to facilitate the rotation of the disk by the fingers, and the size of the disk with its binding is such that it fits snugly in the recess *b* with sufficient friction to retain any position in which it may be set. Another advantage of this binding *n* is that the trouble and expense of grinding the edges of the disk when made of glass are saved.

I claim as my invention—

1. In a microscope, the combination of an object-disk having a series of pictures or objects circularly arranged thereon, a holding-case composed of a bottom piece having a circular recess eccentrically arranged and opening through the side forming a guide of more than a half-circle to embrace the periphery of the disk placed in said recess, and a hole formed through the bottom of the recess, and a cover detachably connected to the bottom piece and having a lens held in a tube projecting from its upper side arranged to aline with the hole through the bottom and the objects on the disk.

2. In a microscope, the combination of a circular bottom piece having a circular recess adapted to receive a circular object-disk and eccentrically arranged in the circular bottom piece so as to cut away the side leaving more than one-half of the periphery of the recess, and a hole formed through the bottom of the recess, a cover with a flange adapted to fit over the side of the bottom and having a tube projecting from its upper surface, and a lens in the tube arranged to aline with the hole through the bottom.

3. In a microscope, the combination of a circular bottom piece having a circular recess adapted to receive a circular object-disk and eccentrically arranged in the circular bottom piece so as to cut away the side leaving more than one-half of the periphery of the recess, a hole formed through the bottom of the recess, a cover with a flange adapted to fit over the side of the bottom and having a tube projecting from its upper surface, a lens in the tube arranged to aline with the hole through the bottom, and a piece of translucent material fitted to cover the hole in the bottom.

4. In a microscope, the combination of a circular bottom piece having a circular recess adapted to receive a circular object-disk and eccentrically arranged in the circular bottom piece so as to cut away the side leaving more than one-half of the periphery of the recess, a hole formed through the bottom of the recess, a cover with a flange adapted to fit over the side of the bottom, and having a tube projecting from its upper surface, a lens in the tube arranged to aline with the hole through the bottom, pins projecting from the side of the bottom piece and bayonet-slots formed in the flange of the cover.

5. In a microscope, the combination of a circular bottom piece having a circular recess adapted to receive a circular object-disk and eccentrically arranged in the circular bottom piece so as to cut away the side leaving more than one-half of the periphery of the recess, a hole formed through the bottom of the recess, a cover with a flange adapted to fit over the side of the bottom and having a tube projecting from its upper surface, a lens in the tube arranged to aline with the hole through the bottom, a circular object-disk having a series of pictures or objects circularly arranged thereon, and a binding covering the periphery of the disk and extending partly over the sides thereof.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 7th day November, 1894.

FREDERICK W. GARDAM.

Witnesses:

MAMIE PARTRIDGE,

ALFRED SHEDLOCK.