B. MAYER.

APPARATUS FOR GRINDING BIFOCAL LENSES.

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914,591. Patented Mar. 9, 1909.

Fig. 1.

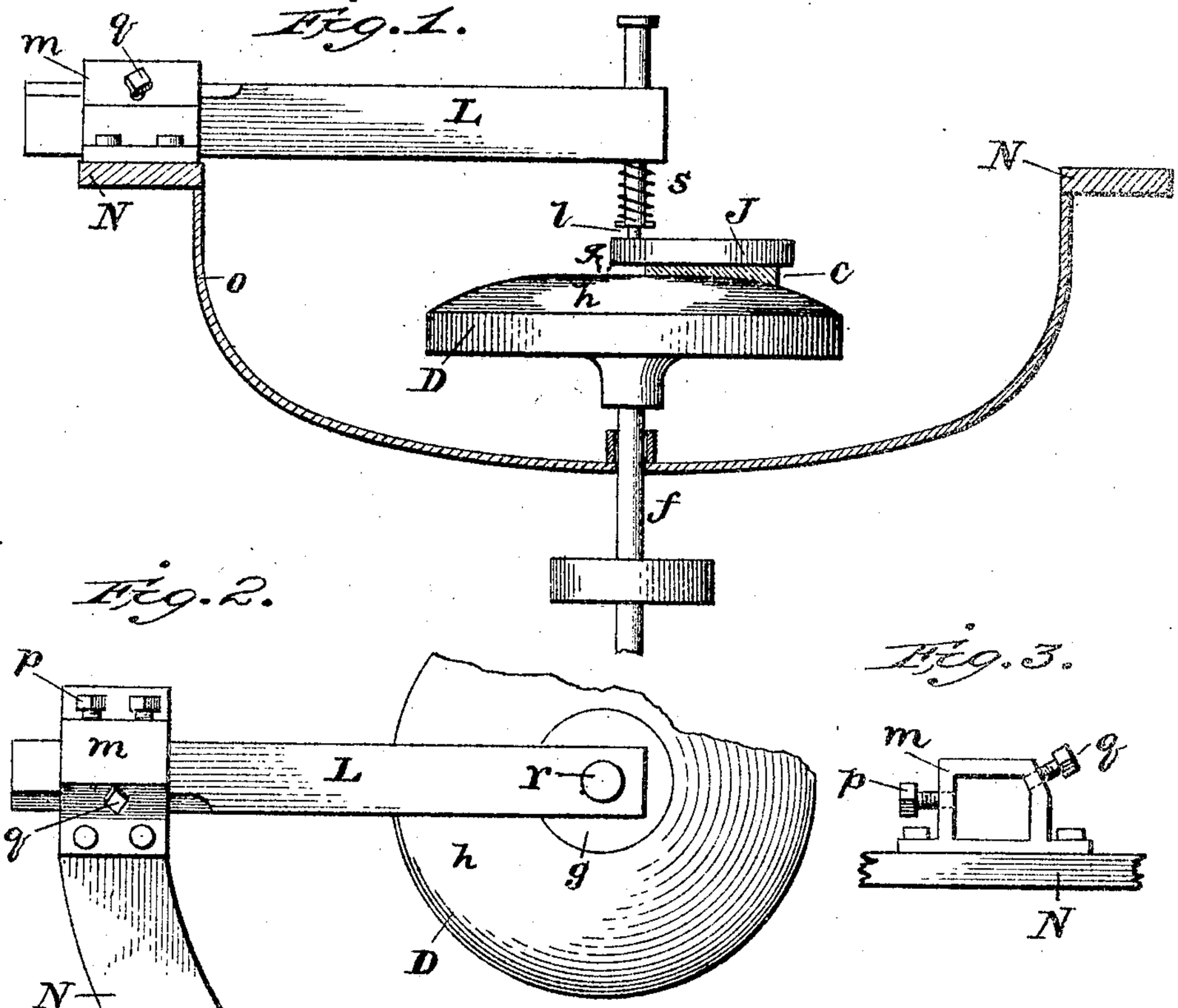

Fig. 2.

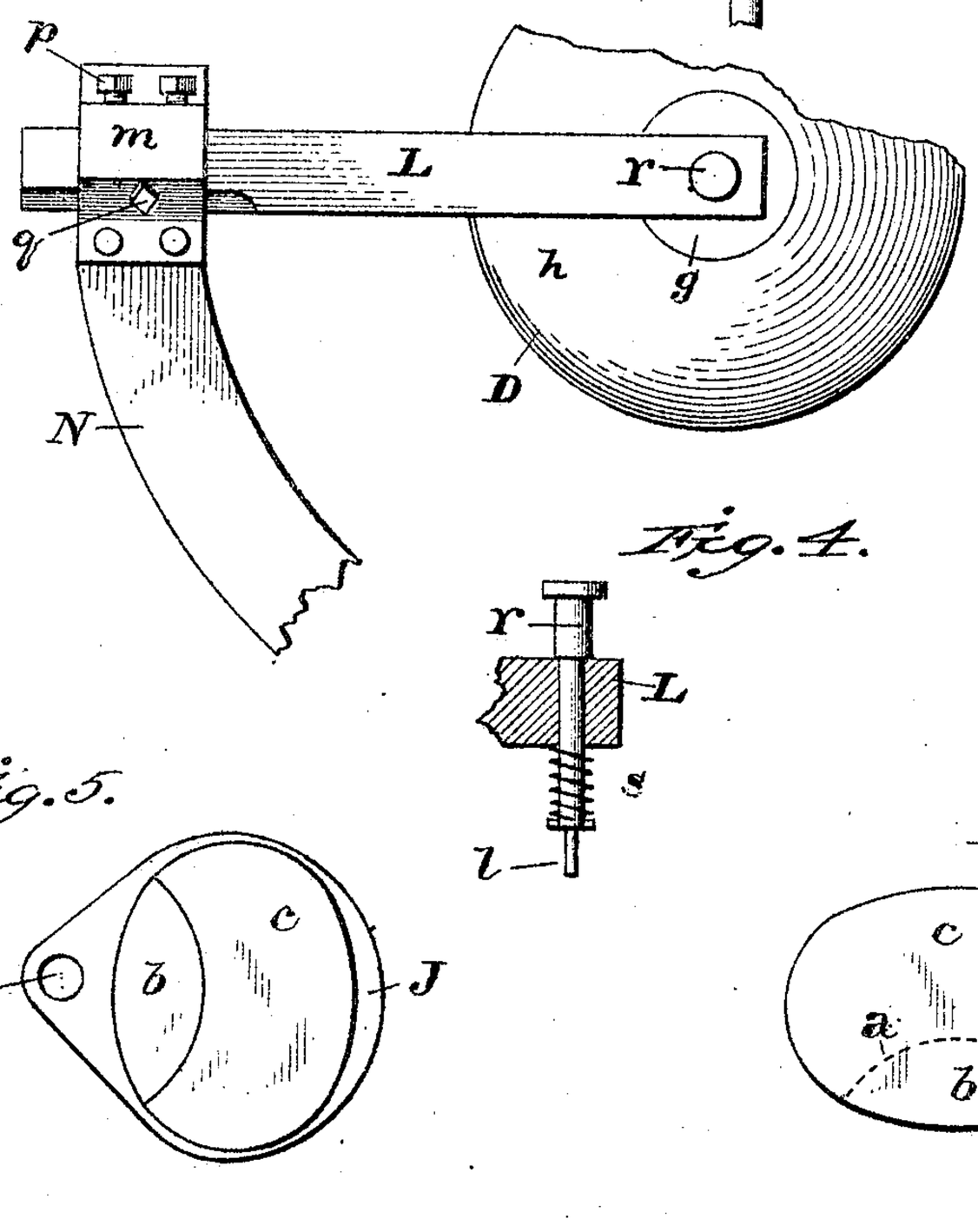

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses:
Edwin L. Gewell
G. Ferd. Vogt.

Inventor
Benjamin Mayer
By Munn & Co.
Attorneys

UNITED STATES PATENT OFFICE.

BENJAMIN MAYER, OF BALTIMORE, MARYLAND.

APPARATUS FOR GRINDING BIFOCAL LENSES.

No. 914,591. Specification of Letters Patent. Patented March 9, 1909.

Application filed March 23, 1906. Serial No. 307,749.

To all whom it may concern:

Be it known that I, BENJAMIN MAYER, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Apparatus for Grinding Bifocal Lenses, of which the following is a specification.

This invention relates to improved apparatus for grinding bifocal lenses.

The object of the invention is to provide improved means for retaining the lens-holder from movement while the glass lens is being pressed upon the revolving grinding disk.

The invention is illustrated in the accompanying drawing, in which,

Figure 1 shows the apparatus in elevation,—the emery pan being in section. Fig. 2 is a plan view of the pin holder and grinding disk. Fig. 3 is an end view of holding box. Fig. 4 shows the center pin in detail. Fig. 5 is a view of the lens holder. Fig. 6 is a view of a solid or single-piece bifocal lens as made by the improved grinding apparatus, and shows the arched line which makes the division between the two fields of the lens.

The bifocal lens ground by the apparatus herein shown, comprises a single piece of glass having two fields—a distance field, *c*, and a near field, *b*, and the two fields separated by an arched division, *a*, which forms neither a crease nor a projecting ridge. Optical lenses of this style when worn scarcely show the arched division. This lens is described in United States Letters Patent No. 798,435 granted to me August 29th, 1905.

The grinding disk, D, has on its upper face two distinct grinding surfaces, *g*, and, *h*, which are closely adjoining, one being at the center and the other concentric or surrounding the first one.

The two grinding surfaces will always differ from each other, as for instance one may be a flat plane and the other convex or concave. The smaller and central grinding surface, *g*, serves to grind the lower or near field of the lens, and the surrounding grinding surface, *h*, grinds the upper or distance field of the lens. In the drawing for the mere purpose of illustration, the central grinding surface, *g*, is shown flat and the concentric grinding surface, *h*, is shown convex.

The grinding disk is mounted at the upper end of an upright shaft, *f*, which is driven by any well-known mechanism.

The lens-holder comprises a block, J, of suitable shape, which, in the present instance, has a side projecting portion with a hole, *k*, through it. The hole of the block when the device is in operation is intended to be coincident with the axis or center of the grinding disk, D, and the varying positions which the hole may have in the block will govern the shape of the near or lower field, *b*, that will be produced on the glass lens. The block must be of such size that when its hole, *k*, is directly over the center of the disk, the block will properly overlap onto both of the two grinding surfaces, *g*, *h*. It is to be understood that the glass lens is to be secured to the block, J, in the ordinary way, that is, by means of cement.

In grinding, the lens which is cemented on the lower side of the block, will have a portion in contact with the central grinding surface, *g*, and a different portion in contact with the other grinding surface, *h*, at the same time.

The improved means devised to retain the block or lens-holder, J, from vibratory or lateral movement while it is being held by the hand and also pressed upon the revolving grinding disk, D, will now be described.

A stiff bar, L, has one end firmly held in a box, *m*, which is secured by bolts to a ring-shaped stand, N, which surrounds the rim of the pan, *o*. This pan, as usual in these grinding machines, surrounds the grinding disk and collects the emery that would otherwise be scattered. The bar, L, fits snugly in the box, *m*, and is adjustable endwise therein, and set-screws, *p*, at one side of the box, and a set-screw, *q*, at an upper beveled corner of the box bear on the bar, L, and prevent it both from endwise movement and from vibration in the box which is important. The bar, L, extends over the grinding disk and at its free end holds a stationary stud or pin, *l*, which points downward and has position coincident with the axis or center of the grinding disk. This stud or pin takes into the hole, *k*, of the lens-block and retains the latter from vibratory

or lateral movement while the disk revolves, it being understood that the operator will hold the lens-block, J, with his hand and prevent it from revolving with the grinding disk, D. There is no revoluble movement of the pin, *l*, but it has an up-and-down movement whereby to lift its end out of the hole, *k*, or to enter its end into said hole.

Fig. 4 shows in detail the construction of the pin and the bolt which carries it. The pin, *l*, projects down from a bolt, *r*, which is vertically movable through the bar, L, a spiral spring, *s*, is around that part of the bolt which projects below the bar and the action of the spring is to draw the bolt downward. The downward-pointing pin, *l*, is fixed in the lower end of the bolt. From this description it will be understood that the bolt, *r*, may be raised against the down-pressure of the spring, *s*, when it is desired to lift the pin, *l*, out of the hole, *k*, in the lens block. As there is no revolution of the pin, *l*, nor of the block, J, there will be no grinding or wear to result in either reducing the size of the pin or in enlarging the size of the hole, *k*. Thus this construction obviates a serious defect existing in those grinding disks which have fixed at their center an upward-projecting pin to which the lens-block is loosely attached. In this last named construction the disk and pin both revolve, and as the emery which is usually employed as an abrasive powder has free access to the parts where the pin turns in the hole of the lens-block, the said parts are rapidly cut by the emery and worn away so that after a little wear accuracy of holding the lens-block to insure steadiness of the said block and uniformity in grinding the arched division line on the lens is impossible.

Besides the advantage just mentioned the construction affords another advantage in permitting slight endwise adjustment of the bar, L, in the box, *m*, which serves to change the extent of the overlap of the lens-block and lens on the central grinding surface, *g*; thus by adjusting the bar the lower or near field, *b*, of the lens may be increased or lessened in size as desired.

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

1. A bifocal lens-grinding apparatus having in combination a revoluble disk having two different grinding surfaces one, *g*, at the center and another, *h*, surrounding the said center; a rigidly-held bar extending over the said disk; a pin held by said bar and pointing downward in a position coincident with the axis of the said disk and with its lower end free, said pin capable of an up-and-down movement independent of the bar and without rotating, and a lens-holding block having at one side a hole with which the said pin engages and said block overlapping the two grinding surfaces of the disk and requiring that the hand of the operator must be applied directly to the block to give the necessary down-pressure on the lens.

2. A revoluble grinding disk for grinding bifocal lenses having two distinct grinding surfaces—one at the center for grinding the near field and a different one concentric with the first-named for grinding the distance field; a lens-holder which overlaps both of said grinding surfaces; a box secured at an elevation above the grinding disk; a bar extending over the grinding disk and held by said box and adjustable endwise therein; and a vertical pin held rigidly by said bar and capable of an up-and-down movement and its lower end engaging with said lens-holder.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN MAYER.

Witnesses:

CHAS. B. MANN,

JOHN W. HEWES.