

J. MOFFITT.
 LENS DRILL.
 APPLICATION FILED AUG. 9, 1917.

1,370,035.

Patented Mar. 1, 1921.

2 SHEETS—SHEET 1.

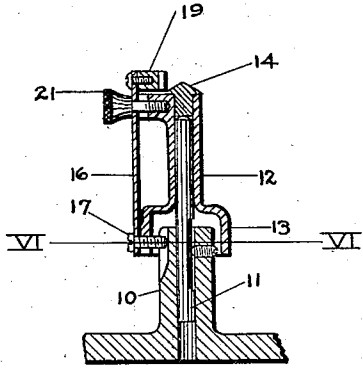


FIG. V.

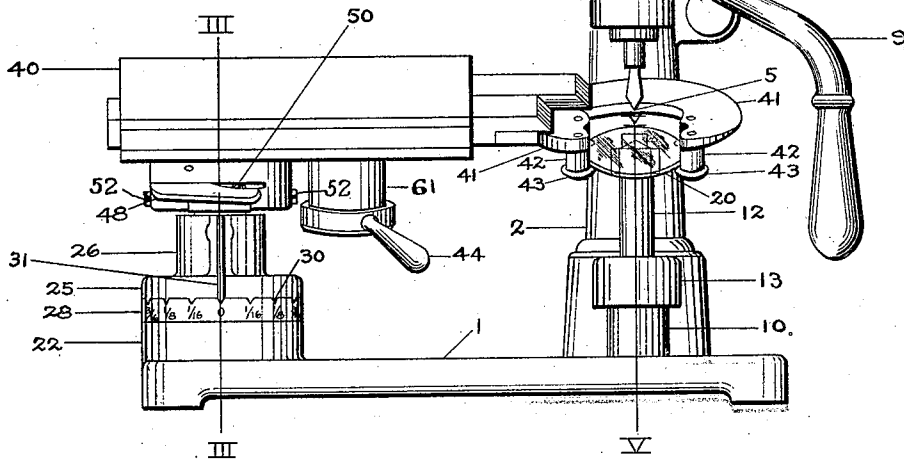


FIG. I.

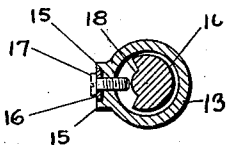


FIG. VI.

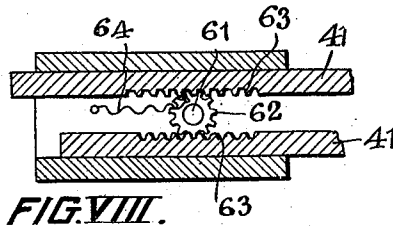


FIG. VIII.

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2 SHEETS—SHEET 2.

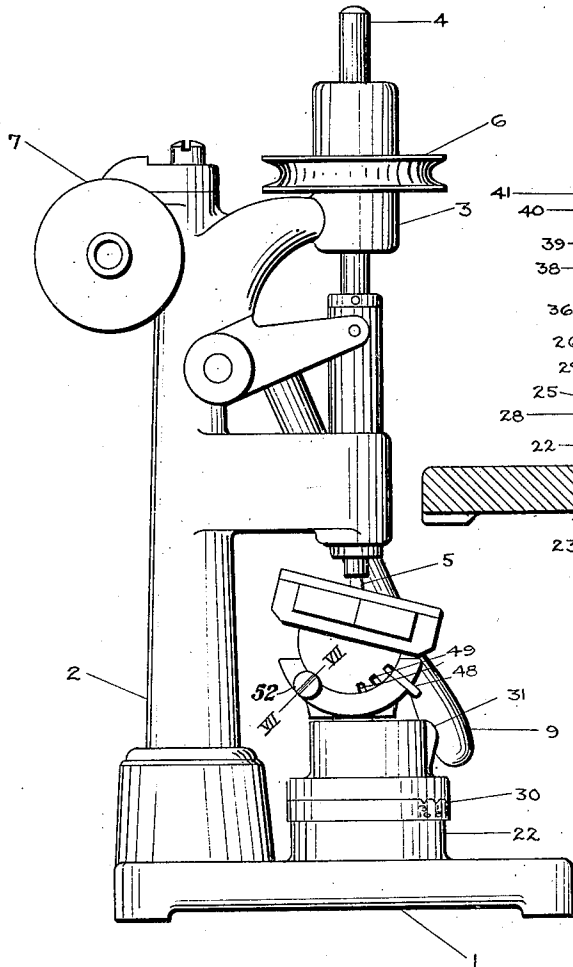


FIG. II.

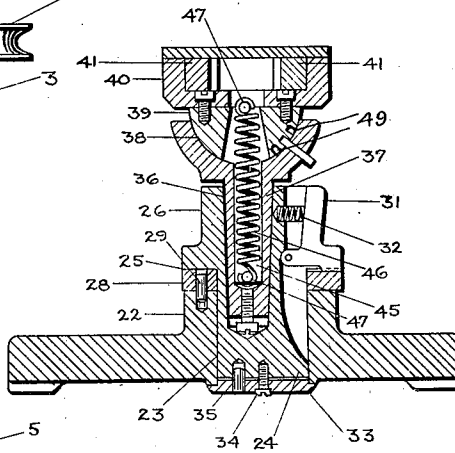


FIG. III.

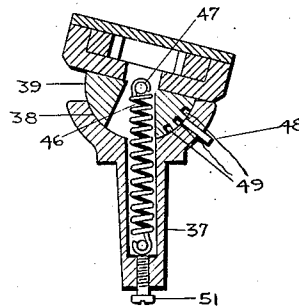


FIG. IV.

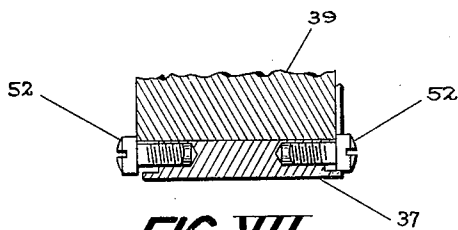


FIG. VII.

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JEREMIAH MOFFITT, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO AMERICAN OPTICAL COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A VOLUNTARY ASSOCIATION OF MASSACHUSETTS.

LENS-DRILL.

1,370,035.

Specification of Letters Patent.

Patented Mar. 1, 1921.

Application filed August 9, 1917. Serial No. 185,291.

To all whom it may concern:

Be it known that I, JEREMIAH MOFFITT, a citizen of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Lens-Drills, of which the following is a specification.

This invention relates to improvements in drills and has particular reference to an improved construction of drill especially adapted for use in the drilling of ophthalmic lenses.

One of the leading objects of the present invention is the provision of an improved construction in which the lens holder or support may be readily adjusted for decantation purposes and for angular positioning of the lens to bring the portion being drilled normal to the drill.

A further object of the invention is the provision of improved means for automatically securing the lens carriage in desired angularly adjusted position.

Other objects and advantages of my improved construction should be readily apparent by reference to the following specification taken in connection with the accompanying drawings, and it will be understood that I may make any modifications in the specific details of construction shown and described within the scope of the appended claims without departing from or exceeding the spirit of my invention.

Figure I represents a front view of my complete drill with the table tilted.

Fig. II represents an end view thereof.

Fig. III represents a sectional view with the parts in non-tilted position, taken as on the line III—III of Fig. I.

Fig. IV represents a similar view of the parts in adjusted position.

Fig. V represents a sectional view as on the line V—V of Fig. I.

Fig. VI represents a cross sectional view on the line VI—VI of Fig. V.

Fig. VII represents a transverse sectional view of the lens holder bearing.

Fig. VIII represents a horizontal sectional view through the lens clamp operating mechanism.

In the drawings, in which similar characters of reference are employed to denote corresponding parts throughout the several

views, the numeral 1 represents the base of my improved drill, having rising from the rear thereof the standard 2 provided with the bearings 3, in which is slidably mounted the spindle 4 bearing on its lower end the drilling point 5, and on its upper end the pulley 6, around which and the pulleys 7 carried by the standard 2, passes a belt 8 for driving the spindle and thus the drilling point 5. A handle 9 serves to vertically shift the drill spindle 4 to move the drill into and out of engagement with the lens.

Rising from the base 1 immediately beneath the spindle 4 is a post 10 bearing the pin 11, on which is swiveled the sleeve 12 having the lower flared cap portion 13 encircling the post 10, the neck having at the upper end the hardened conical shaped lens supporting point 14.

Projecting rearwardly from the portion 13 are the ears 15, between which are disposed the spring member 16 secured in position by the screw 17, which projects inwardly from the member 13 adapted to ride in the recessed portion 18 of the post 10 which thus serves to limit the swinging movement or swiveling of the sleeve 12 about the pin 11. The purpose of this limited swiveling is to keep the spring member 16 at all times disposed rearwardly of the drill so that the stop 19 at the upper end of the spring may always be in proper position to engage with the edge of the lens 20 to be drilled, a set screw 21 serving to force the stop 19 in toward the point 14 against the action of the spring, or when released allowing the spring to force the stop rearwardly away from the lens receiving point.

At the opposite side of the base plate 1 from the parts just described is a large boss or upwardly extending portion 22 having formed downward therethrough the cylindrical bore or passage 23 adapted to receive the stud 24 having near its upper end the peripheral flange 25, above which projects the sleeve portion 26 mounted upon the stud 24. Intermediate the boss 22 and flange 25 is a ring 28 locked rigid with the boss, as by the pin 29, and having in its upper edge a plurality of suitably designated notches 30. A pivoted latch member 31 carried by the sleeve 26 and actuated by the spring 32 serves to engage with a selected notch to lock the stud and sleeve in rela-

tively adjusted position. To readily secure the stud in position and to permit of desired rotation thereof I may if desired secure to the lower end the shouldered washer 33 held in position by the screw 34 and having the pin 35 interlocking with the lower end of the stud so that the washer will turn therewith and liability of loosening of the retaining screw be avoided.

It will be noted particularly by reference to Figs. II and III, that the sleeve 26 is eccentrically disposed with respect to the stud and consequently rotation of the stud and sleeve will serve to vary the distance between the sleeve and any parts carried thereby and the lens supporting point 14, the amount of variation being denoted by suitable figures or marks disposed adjacent the several notches 30.

As is clearly illustrated in Fig. III for example, the socket in the stud and sleeve 26 in place of being cylindrical in form is frusto-conical or tapered, this socket 36 being adapted to receive the exteriorly tapered sleeve or pintle 37 bearing at its upper end the cylindrically curved seat 38 on which rests the semi-cylindrical shaped slide 39 bearing the lens carriage or holder 40, on which are mounted the pair of relatively movable jaw members 41 having the plurality of depending lens centering pins 42 on whose heads are the lens 20. This lens 20 is automatically centered between the pairs of pins 42 on the opposite jaws, while said pins are provided on their lower ends with the heads 43 to limit the downward movement of the lens while permitting of its upward sliding on the body portion or shank of the pins, as desired. A suitable handle 44 serves to actuate the jaws and open them any desired amount, attention being called to the fact that the size and curvature of the jaws as illustrated in Fig. I is such as to permit of their receiving an extremely large lens, such as a goggle lens or the like.

In the drilling of ophthalmic lenses it is extremely desirable that the lens be tilted to such position that the drill point will act normal to the surface being drilled, and to accomplish this result I suitably tilt the lens holding mechanism just described in the manner illustrated in Figs. I and IV. To facilitate this result I make use of the semi-cylindrical seat 38 and bearing member 39 interlocking with the seat, the curvature of said parts being such that the lens will be tilted about a point slightly above the upper end of the lens rest 14 so that the actual position of the lens will be varied but slightly during the angular adjustment thereof.

To permit of this tilting movement as desired and at the same time readily secure the parts in desired relation, I preferably

employ the mechanism illustrated in Figs. II and III, this mechanism consisting essentially in forming the pintle 37 with an interior chamber 45 to receive the spring 46 held by the pin 47 at the lower end and suitably secured to the lens holder bearing 38 at the opposite end, this securing device taking the form of a pin 47 or other desired connection.

The operation of these parts should best be understood by reference to Fig. IV, from which it will be seen that the bearing member 39 has an elongated slot formed therein, in which the securing spring 46 may ride during tilting of the table so that the spring in no wise interferes with the tilting movement, the spring simply swinging about the pin 47, while at the same time the tension of the spring pressing the member 39 against its bearing 38 is sufficient to lock the parts in tilted position without additional mechanical locking members being employed. If desired, however, to supplement the retaining action of the spring I may employ a latch 48 adapted to be engaged in the notch 49 near the end of the semi-cylindrical member 39, as shown in Fig. II, a suitable spring 50 serving to actuate the latch into locking position, while the latch has its handle portion projecting outwardly from the member 38 so it may be easily pressed inward and released by the thumb when the hand is resting upon the lens holder 40 to unlock the latch and allow of desired tilting of the lens holder.

In connection with this device I wish also to call attention to the adjustable pivot bearing or stop member, preferably in the form of a screw 51 at the lower end of the spindle 37. This member it will be seen rides on the bottom of the tapered chamber or spindle receiving socket 36, and is preferably so adjusted that the spindle will just turn freely in the socket while the tapered fit of the parts prevents any relative play. As under use the parts loosen up it is merely necessary to slightly adjust the pivot bearing 51 and allow the lens carriage to move down when the tapered fit between the socket and spindle will again tighten up the relation of the spindle and socket and eliminate the play caused by wear of these parts.

From the foregoing description taken in connection with the accompanying drawings, the construction and use of my improved drill should be readily apparent, and it will be seen that it is merely necessary to open the jaws 41, as by actuation of the handle 44, when the lens 20 may be easily placed in position between the pins 42 and pressed downward to rest on their heads 43, the operation of the structure in these respects being in accordance with prior art usage, as shown for example in patent to Day, No. 807,064. The carriage is then set

for normal or above or below center drilling, as desired, by rotation of the sleeve 26 and associated parts, and locked by engagement of the latch 31 in the appropriate notch 30.

5 The lens carriage is then swung about the spindle 37 as a center inward until the edge of the lens contacts with the stop 19 and the carriage tilted to the desired angle so that the surface of the lens for a meniscus
10 or toric will be substantially normal to the axis of the drill spindle 4 and drilling point 5, when pressure on the handle 9 brings the drilling point down onto the lens to form the desired aperture. The lens may then be
15 turned over and the parts reversely tilted and the second side of the lens drilled.

Particular attention is called to the fact that by the use of the tapered spindle 37 and limiting pivot 51 these parts may be
20 readily turned out according to standard specifications and may be quickly and easily fitted into either old or new sockets and the parts when assembled have the necessary rigidity and ease of pivotance required in a
25 device of this nature.

Attention is also invited to the adjustment which may be accomplished in connection with the tilting bearing to take up any wear of the carriage and properly position
30 the center of the automatic lens centering mechanism beneath the drilling point. This is accomplished, as will be more clearly understood by reference to Fig. VII, through the use of the pair of screws or similar type
35 of fastening members 52 which are engaged in the ends of the wall of the member 38 and have one side of their heads bearing against the end of the slide 39. It will be understood that by loosening the member or
40 members 52 at one end and correspondingly tightening the similar members at the opposite end that the slide may be given a slight longitudinal adjustment in the bearing seat and thus compensate for any wear
45 in the parts or permit of the initial adjustment of the several parts of the machine into exact correct relation one with the other.

In Fig. VIII, I have specifically illustrated the mechanism for actuating the jaws
50 41. This mechanism comprises the rock shaft or member 61 journaled in the clamp arm carriage 40 bearing on its upper end the pinion 62 in mesh with the two rack
55 portions 63 of the lens clamp jaws 41, the said racks being disposed on opposite sides of the pinion so that rocking of the handle 44 toward the left will open the jaws, and reverse rocking of the handle will tend to
60 close them. To facilitate this reverse turning of the pinion and parts I may secure to the pinion the spring 64 having its other end suitably secured to the member 40 so that separation of the jaws will place the
65 spring under tension and upon release of

the handle the spring will again close the jaws, clamping the lens in position therebetween.

I claim:

1. A device of the character described, including a base, a drill standard and drilling spindle supported thereby, a socketed member rising from the base, a taper spindle rotatably engaged in the socket of said member, a bearing carried by the spindle, a lens
70 holder having a bearing interlocking with the spindle bearing, and means for frictionally forcing the bearings into engagement one with the other to automatically secure the parts in desired adjusted position on
75 their bearings. 80

2. A lens cutter including a base, a post rotatably mounted on the base, means for locking the post in desired rotatably adjusted position, an eccentrically disposed
85 socket collar carried by the post and adjustable by rotation thereof, a spindle engaged in the socket and provided with a head of arcuate shape in cross section, a lens clamp member having an arcuate portion fitting
90 the head, a tension spring having one end secured to the lens clamp member and the other to the spindle for drawing the two arcuate surfaces together, and means for locking the surfaces in desired relation. 95

3. In a device of the character described, the combination with a lens holder, of a bearing carried thereby, a second bearing frictionally engaged with the first, a base, means rising from the base to support said second
100 bearing and a spring carried by one of the bearings and engaging the other for drawing the parts into frictional locking engagement one with the other.

4. In a device of the character described, the combination with a base, of a rotatably adjustable stud carried by the base and having a taper socket, a lens holder having a taper spindle rotatably engaged in the
110 socket, and an adjustable pivot member carried by the spindle and engaging the bottom of the socket for limiting the telescoping of the spindle into the socket.

5. In a device of the character described, the combination with a rotatable stud, having a sleeve carried thereby and also having
115 an eccentric socket, a spindle rotatably mounted in said eccentric socket and laterally adjustable by rotation of the stud and sleeve, said spindle having a bearing, a lens
120 holder having a second bearing interengaging with the bearing on the spindle, the spindle having a central socket formed therein and a spring fitting in the socket in the spindle and having one end secured to
125 the spindle and the other end to the lens holder for pressing the bearing surfaces of the two bearings into frictional engagement one with the other, substantially as and for the purpose described. 130

6. In a device of the character described, the combination with a rotatable stud, having a sleeve carried thereby and also having an eccentric socket, a spindle rotatably mounted in said eccentric socket and laterally adjustable by rotation of the stud and sleeve, said spindle having a bearing, a lens holder having a second bearing inter-engaging with the bearing on the spindle, the spindle having a central socket formed therein and a spring fitting in the socket in the spindle and having one end secured to the spindle and the other end to the lens holder for pressing the bearing surfaces of the two bearings into frictional engagement one with the other, and a latch member for supplementing the action of the spring and positively locking the two bearings in relatively adjusted relation.

7. In a device of the character described, the combination with a base, of a boss rising therefrom, a guide ring locked on the boss, a flange member having a depending stud rotatable in the boss and a sleeve projecting above the flange, the ring being disposed about the stud between the ring and flange, said ring having a plurality of notches formed in its upper edge, the sleeve being eccentrically disposed as respects the stud whereby the sleeve is laterally shifted by rotative movement of the flange member and the spring pressed latch member intermedi-

ately pivoted to the flange member, and having a depending lower end adapted to be selectively engaged in the notches of the ring, and a spring pressed upper actuating end adapted to be pressed inwardly toward the sleeve to disengage the lower end from said notches, substantially as illustrated.

8. In a device of the character described, the combination with a cylindrical bearing, of a support therefor, a lens holder having a slidable bearing engaging the first mentioned bearing, a spring tension device for holding the parts in frictional engagement one with the other, and supplemental means for locking the parts in desired relatively adjusted position.

9. In a device of the character described, the combination with a cylindrical bearing, of a support therefor, a lens holder having a slidable bearing engaging the cylindrical bearing, a spring for holding the parts in frictional engagement one with the other, and means for relatively longitudinally shifting said parts, substantially as and for the purpose described.

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

JEREMIAH MOFFITT.

Witnesses:

H. K. PARSONS,
E. M. LAFLEW.