H. K. PARSONS.

DRILL.

APPLICATION FILED JULY 5, 1916.

1,246,005.

Patented Nov. 6, 1917.

2 SHEETS—SHEET 1.

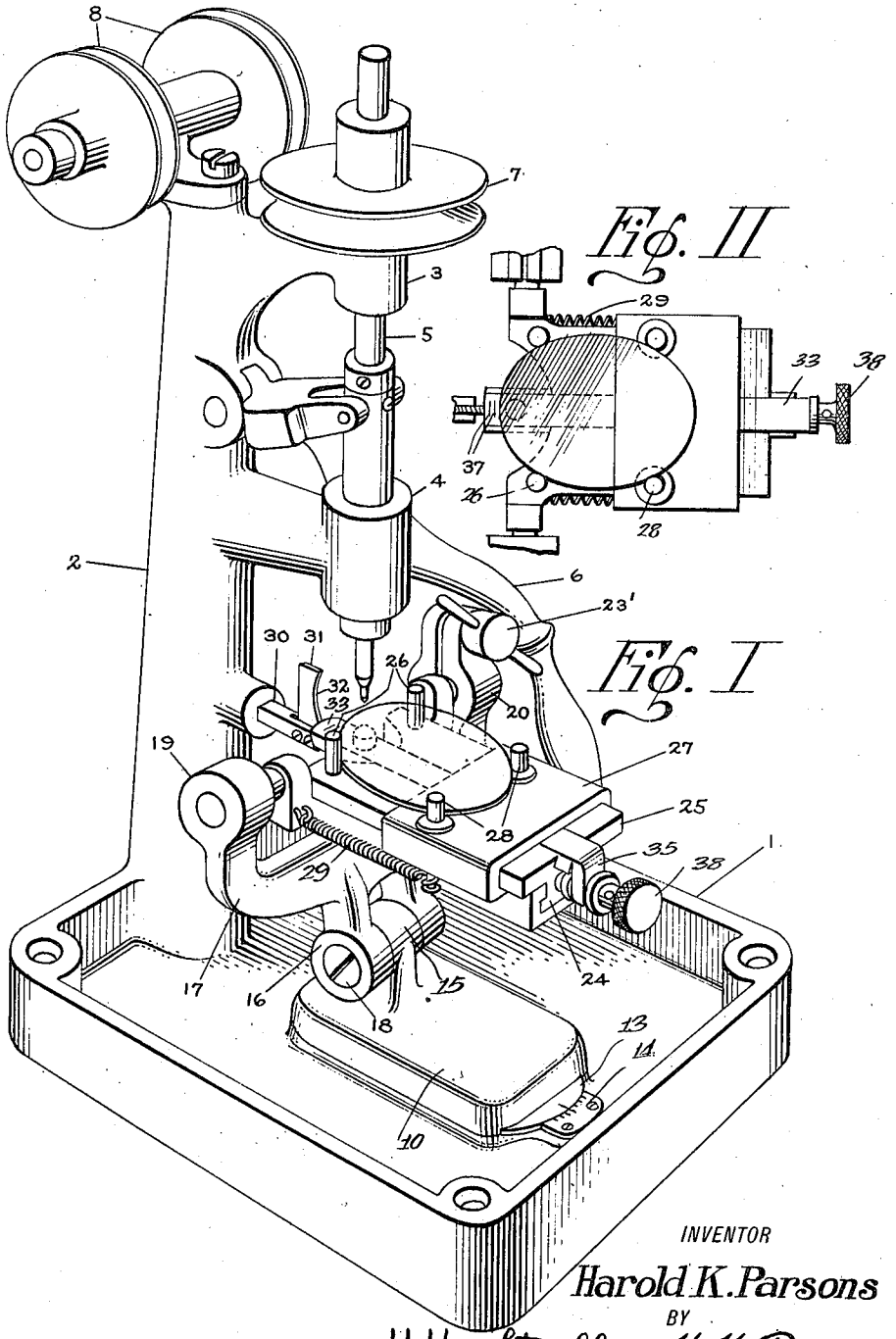


Fig. II

Fig. I

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2 SHEETS—SHEET 2.

Fig. III

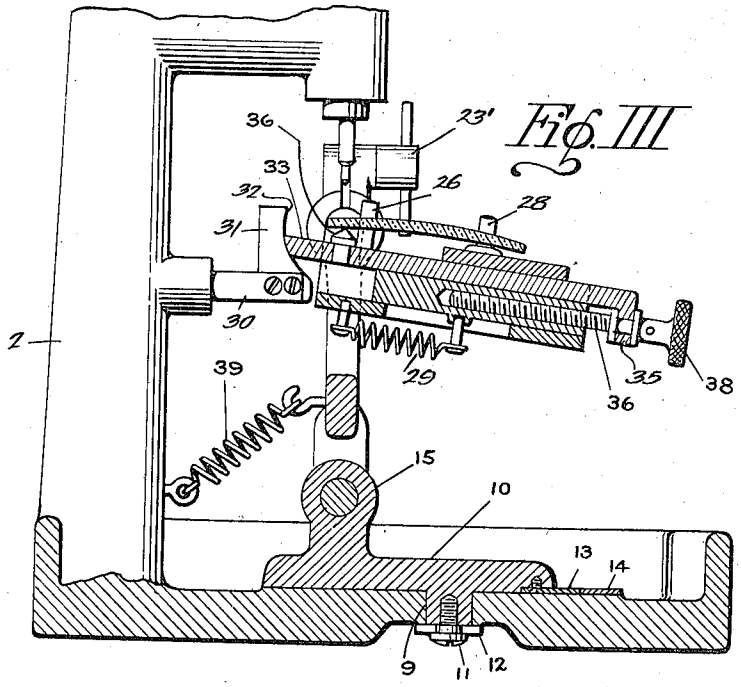


Fig. IV

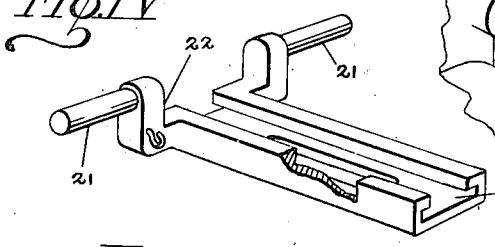


Fig. V

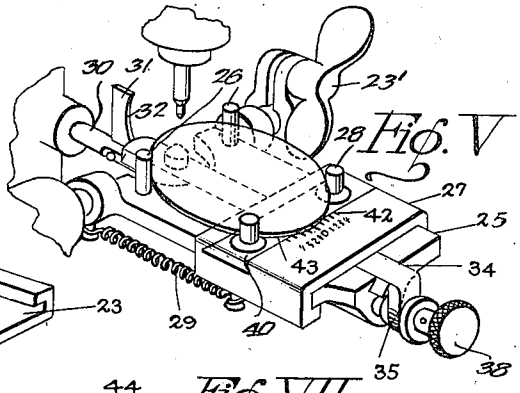


Fig. VI

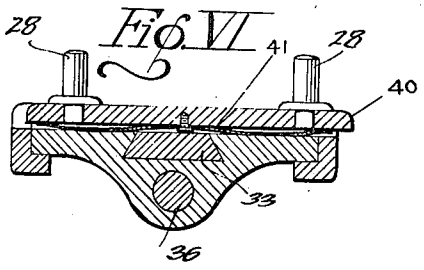
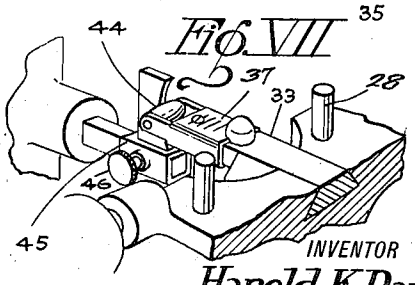


Fig. VII



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UNITED STATES PATENT OFFICE.

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DRILL.

1,246,005. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed July 5, 1916. Serial No. 107,585.

To all whom it may concern:

Be it known that I, HAROLD K. PARSONS, 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 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 particularly adapted for use in connection with opthalmic lenses.

The leading object of the present invention is the provision in a lens drill of improved means for accurately determining and regulating the exact points on a lens at which the drilling operation will take place.

A further object of the invention is the elimination of the commonly used stop engaging the edge of the lens to be drilled and the replacement of this form of stop with an improved positioning and indicating member which may be readily adjusted to control the depth of drilling from the edge of the lens, which will indicate the exact position at which the drilling will take place and which will form a support for the lens at the exact point where it is to be drilled irrespective of the adjustment of the lens or other parts of the machine.

Other objects of the present invention include the provision of an improved type of lens holding carriage, or improved means for facilitating drilling of the lens at decentered points or points above or below the geometrical axis of the lens, and in general the simplification and increasing of the efficiency of the several parts of a lens drill.

Figure I represents a perspective view of a complete drill constructed in accordance with, and embodying the generic principles of my invention.

Fig. II represents a fragmentary plan view of the lens holding carriage and drill indicator and stop device.

Fig. III represents a central vertical sectional view of my improved construction.

Fig. IV represents a perspective view of the carriage support or bed plate.

Fig. V represents a fragmentary perspective view illustrating my improved decentering means.

Fig. VI represents a transversed sectional view centrally of the parts shown in Fig. V, and

Fig. VII represents a fragmentary perspective view illustrating an adjustable or wear-compensating stop device and roller for engagement therewith.

In the drawings, in which similar characters of reference are employed to denote corresponding parts throughout the several views, the numeral 1 designates the base of my drill, having rising therefrom the customary standard 2, provided with the bearings 3 and 4 for the drill spindle 5, adapted to be moved toward the work as by the handle 6, and driven through the medium of a belt passing around the drive pulley 7 and idlers 8, these parts being of any usual and ordinary construction as may be desired.

In that form of my invention illustrated in Figs. I and III for example, I have shown as pivotally secured in the base 1, the depending lug 9 of the lens holder base 10, connected with the main base of the frame as by the screw 11 and washer 12, to permit of pivotal movement of the carriage base 10 as desired, an indicator plate 13, secured to one side of the member 10, cooperating with the dial or scale 14 to denote the effect of pivotal adjustment of the said member 10.

This base 10 has rising therefrom, the ear 15 spanned by the pair of ears 16 on the yoke 17, the ears 15 and 16 being pivotally connected as by the bolt 18. This yoke 17 terminates in the pair of enlargements 19 and 20, adapted to receive and form pivotal bearings for the spindles or trunnions 21 on the bed plate 22. It will be noted that the enlargement or bearing 20 is split and provided with the clamp screw 23, adapted to draw the portions of the split together to lock the inclosed trunnion and thus the bed plate 22 against rocking or pivotal movement.

In that form of the invention illustrated in Figs. I and IV for example, I have shown the bed plate 22 as formed with the T shaped

or undercut groove or guide way 23', in which is slidably mounted the depending T shaped rib 24 of the lens carriage 25, which bears at its forward end the pair of lens positioning pins 26 adapted to engage the forward edge of the lens. A supplemental clamp slide 27 embracing the carriage 25 bears a second pair of pins 28 adapted to engage the rear edge of the lens to automatically center the same in correct position on the lens carriage, as would be best understood by reference to Figs. I and II. Springs 29 are preferably connected to the clamp slide 27 and suitable hooks or attaching devices on the bed plate 22 to move the slide inward. In this manner the single pair of springs serves both to clamp the lens in position between the pins 26 and 28 and at the same time to move the entire lens carriage inward toward its innermost limit of movement.

To limit the inward movement of the lens carriage and lens under the influence of the spring or springs 29, there is secured to the standard 2, a projecting bar, or the like, 30, bearing the contact shoe 31, having an arcuate inner contacting face 32. This face is adapted to engage the beveled terminus of the adjustable stop bar 33, which is preferably of dove tail form and is slidably engaged in the undercut groove 34 formed in the carriage member 25, said stop member 33 having a downwardly bent outer end 35 in which is rotatably but non-slidably mounted the adjusting screw 36 having the knurled head 38 which may be turned to adjust the stop member 33 in or out a desired amount. The member 33 is provided with the lens rest 36 preferably in the form of a conical point and with a plurality of graduations or suitable designations 37. In use the lens is suitably mounted between the pairs of pins 26 and 28 and resting upon the point 36, the point 36 then being adjusted in or out to come beneath the exact point on the lens at which it is desired to form the drilled aperture, one of the designations 37 being adapted to aline with the edge of the lens and denote the number of millimeters or the like which the point is located inward of the edge of the lens, while as the distance from the beveled end of the member 33 to the point 36 is constant, the point is at all times in exact axial alinement with the drill and drill spindle 5, adjustment of the point relative to the lens, therefore, moving the lens carriage in or out against the tension of the springs 29 or else swinging the carriage and yoke 17 outward together against the tension of the spring 39 which normally swings the yoke toward the standard 2. The advantage of this construction should be at once apparent, in that it will be noted the lens may be mounted in the lens centering holder or clamp in the usual manner with the yoke swung outwardly on its pivot 18 if desired and the point 36 then adjusted to lie under the exact point at which it is desired to drill the lens, after which the entire device may be swung inward into operative position. It is also to be noted that on account of the engagement of the trunnions 21 in the bearings of the yoke that by loosening of the clamp nut 23 the carriage may be rotatively adjusted according to whether convex, concave or meniscus surfaces are to be drilled, the raised relation of the trunnion 21 to the bed plate and parts mounted on the bed being such that the apex of the lens support 36 projects substantially into the pivotal axis of the parts. The result of this is that the position of the point relative to the axis of the drill is not varied by rotative adjustment of the lens, lens holder and supporting bed plate therefor, and consequently the point is at all times in the axis of the drill and serves as an accurate gage for the position of the lens irrespective of the other adjustments of the parts.

In connection with certain forms of mountings, or shapes of lenses, it sometimes proves desirable that the lens be drilled either above or below center. In the drawings I have shown two methods by which this may be accomplished, the one consisting in pivotal adjustment of the carriage base 10 and parts carried thereby, the effect of this adjustment being indicated by the scale 14 and indicator plate 13.

The preferred construction for attaining this result, however, has been illustrated in connection with Figs. V and VI, by reference to which it will be noted that the pins 28 are carried by the slide 40, movable transversely of the lens clamp slide 27. A blade spring member 41 secured to the underside of the slide 40 exerts sufficient friction to lock the slide in any desired adjusted position, while sliding outward to one side or the other serves to twist the lens and thus vary the portion of the lens which will lie directly over the point 36, or as it is commonly termed, to decenter the lens or position it for drilling above or below center. Suitable designations 42 and registering indication marks, pointer, or the like 43 on the clamp slide 27 and transversed pin-bearing slide 40, together serve to indicate the amount of adjustment of the inner end of the lens produced by predetermined amount of movement of the slide bar. If preferred, however, in place of using the designations for this purpose, a dot or the like may be placed on the lens at the exact point at which it is desired to drill the same, the slide bar adjusted till the mark is in longitudinal alinement with the point 36 and the point

36 then adjusted through rotation of the lens by lateral shifting of the pins 28 till the point is beneath the dot, when the machine will be found to be set in correct position for the particular drilling desired.

It will be noted that in Fig. V I have illustrated a slightly different construction from that described in connection with Figs. I and II, in that in place of employing the lens holder slide 25, the lens clamp member 27 slides directly on the bed 22, while the front pins 26 are likewise carried directly by the bed in place of indirectly upon the lens carriage slide. The only difference in this instance is that adjustment of the member 33 against the contact shoe 31 swings the yoke 17 outward on its pivot 18 against the tension of the spring 39 or allows the spring to draw the yoke and thus the other parts inward in place of the movement being primarily imparted to the slide carriage as previously described.

In this connection attention is called to the fact that the arcuate contact surface 32 of the shoe is such as to compensate for the variation in position of the end of the member 33 occasioned by rotative adjustment of the parts about the trunnions 21 as a pivot center, to at all times maintain the apex of the supporting point 36 in axial alinement with the drill spindle and drill.

In Fig. VII I have shown a slight modification of the contact point in which in place of making the same a plain beveled edge I have mounted the barrel shaped roller 44 on the end of the member 33, providing a device which will have a little freer movement and will not have as great tendency to wear, while the contact shoe is likewise carried by a sleeve 45, adapted to be locked in adjusted position by the set screw 46, this adjustment serving as a take-up for any possible wear of the parts in case of frequent adjustment for varying styles of lenses. The particular object of the barrel-shaped roller here referred to is in the event of a pivotal adjustment of the lens holder base 10 and parts carried thereby about the lug 9, this barrel shape will compensate for the variation in position occasioned by the swinging movement horizontally of the several parts, while the inclination and arc of the arch 32 of the shoe 31 compensates for the tilting adjustment of the lens holder itself.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of my improved drill should be readily apparent, and it will be seen that I have provided an extremely simple and desirable construction in which the exact point at which the lens is to be drilled may be readily determined upon positioning of the lens within the holder, in which a support for the lens is positively provided immediately beneath the point at which the drilling is to occur, which support may be adjusted relative to the lens as desired, and in which the several parts may be then moved into operative position without disturbance or relative movement of the point which will remain fixed in the position determined when the lens is mounted within the holder and consequently an improved drill in which exact and accurate drilling of the lens either in normal position on its geometrical axis, or at any desired relation to said geometrical axis, and near to or more distant from the edge of the lens as desired, may be accomplished.

I claim:

1. In a lens drill, the combination with a base and a standard rising therefrom, of a drill operatively supported by the standard, a stop carried by the standard, a lens holder movable toward the stop, and an adjustable device carried by the holder and engaging the stop for regulating the position of the lens holder relative to the drill, substantially as illustrated.

2. In a drill, the combination with a base and standard carried thereby, of a drill operatively supported by the base, a yoke pivotally connected to the base, a lens holder carried by the yoke, means for swinging the yoke toward the standard, a stop carried by the standard, and means supported by the yoke and engaging the stop for limiting the movement of the yoke toward the standard to control the position of a lens when within the holder.

3. In a lens drill, the combination with a base and a drill standard rising therefrom, of a lens holder mounted on the base for tilting adjustment and for movement in direction of the standard, a curved stop carried by the standard, and an adjustable contact member on the lens holder adapted to engage the stop to limit the movement of the holder in the direction of the standard, the curvature of the stop being such as to compensate for the tilting movement of the holder to maintain the holder a predetermined distance from the standard, irrespective of the tilting movement.

4. In a lens drill, the combination with a lens centering holder, of a slide movable relative to the holder, a lens supporting point carried by the slide for adjustment relative to the holder, a drill support, and means on the drill support engaging the slide to maintain the point thereon in alinement with the drilling point of the drill.

5. In a lens drill, the combination with a base of a standard carried thereby, a drill point carried by the standard, a yoke pivoted to the base and adapted to be swung toward the standard, means for actuating the yoke toward the standard, a lens holder

mounted for tilting movement in the yoke, an adjustable stop slide carried by the holder, and a contact shoe carried by the standard for engagement with the stop slide to limit the movement of the holder and yoke toward the standard, said contact shoe having an arcuate contact face concentric with the axis about which the holder tilts, whereby the holder remains in constant relation to the standard and drill, irrespective of its tilting movements, substantially as described.

6. A holder for a lens drill, including a basal section having a pair of spaced pins, a clamp section slidably mounted on the base section and having a second pair of spaced pins, whereby said pins are adapted to engage the edge of a lens at four points to center the same, and means on the clamp section for laterally shifting its pair of pins with respect to those of the basal section to vary the relation of the geometrical axes of the lens to the holder, substantially as for the purpose described.

7. In a lens drill, a drill, a contact shoe mounted adjacent to the drill, and means for properly positioning a lens for the drilling operation, including a holder having a plurality of centering pins for engaging the edge of the lens, certain of said pins being mounted for lateral movements to vary the position of the lens, means tiltingly supporting the holder to permit of adjustment of the holder to bring the surface of the lens normal to the drill, and a combined indicating and stop device, carried by the holder, having an adjustable point adapted to be alined with the spot on the lens to be drilled and having a terminal contact portion adapted to engage said contact shoe to aid in controlling the position of the lens and holder relative to the drill.

8. In a lens drilling machine, the combination with a lens holder movable toward and away from the drill, of a stationary contact shoe, and a stop carried by the holder for engagement with the shoe, said stop having a point adapted to register with the portion of the lens to be operated upon by the drill, and having designations indicating the distance of the point from the edge of the lens, substantially as illustrated.

9. A lens drilling machine, including a support and a drilling member carried by the support, a lens holder support movable bodily toward and away from the axis of the drill in a plane substantially normal thereto, a lens holder pivoted on said support for tilting movement in a plane at right angles to the axis of the drill, an adjustable lens supporting point on the holder having its lens engaging point disposed in the tilting axis of the holder, means for adjusting the position of the point, including a suitable, shiftable support therefor, and means engaging the support for the point to maintain the point in fixed relation to the axis of the drill, irrespective of the tilting adjustment of the lens holder.

10. In a lens drill, a lens holder having points engaging the edge of the lens to center the same, means for laterally shifting certain of the points to vary the position of the lens in the holder, a slide adjustable longitudinally of the holder, a lens supporting point carried by the slide and adjustable therewith, whereby adjustment of the slide and of the lens engaging pin will bring any desired point on the lens immediately over the supporting point therefor, and means engaging the slide for controlling the position of the point relative to the remainder of the drill, regardless of its adjustment relative to the lens and lens holder.

11. In a lens drill, the combination with a base and a drill supported thereby of a yoke hinged to the base for swinging movement toward and away from the axis of the drill, and a lens holder supported by the yoke for tilting movement relative to said axis.

12. In a lens drill, the combination with a base and a drill supported thereby of a yoke hinged to the base for swinging movement toward and away from the axis of the drill, and a lens holder supported by the yoke for tilting movement relative to said axis and means for locking the holder in desired tilted position in the yoke.

13. In a lens drill, the combination with a base of a yoke pivoted to the base, a drill carried by the base, means for automatically swinging the yoke toward the drill, and a lens holder supported by the yoke and brought into operative position by the movement of the yoke toward the drill.

14. In a device of the character described, the combination with a bed plate, of a lens holder mounted on the bed plate, a channel formed in the bed plate, and a lens rest slidably mounted in the channel and projecting upward therefrom to engage a lens, substantially as and for other purposes described.

15. A lens drill, including a base, a vertically disposed bracket pivoted at its lower end to the base and rising therefrom, a horizontally disposed lens holder tiltably supported by the upper portion of the bracket, means for limiting the tilting of the holder in a horizontal plane and the swinging of the bracket in a vertical plane, and a lens drill supported by the base for operation on a lens held within the holder.

16. In a device of the character described, the combination with a base and a drill standard rising therefrom, of a contact shoe adjustably supported by the standard, a lens holder movable toward and away from

the shoe, said holder bearing a lens supporting point and a terminus contact for engagement with the shoe, whereby adjustment of the shoe with respect to the standard serves to control the position of the point with respect to the drill mounted on the standard, substantially as illustrated.

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

HAROLD K. PARSONS.

Witnesses:
EDITH M. HALVORSEN,
G. F. FLOOD.