

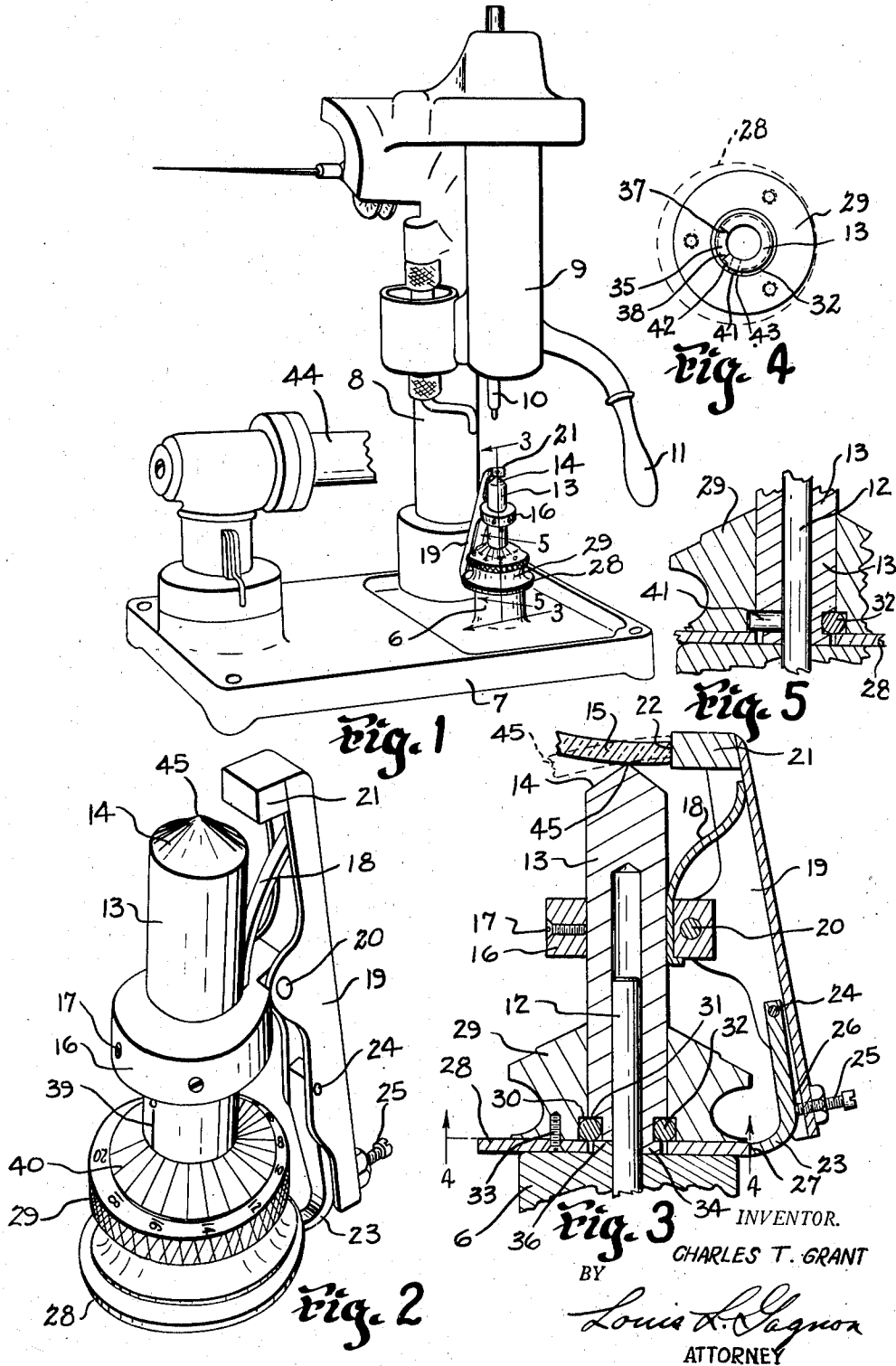
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WORK SUPPORT FOR LENS DRILLING MACHINES

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WORK SUPPORT FOR LENS DRILLING
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This invention relates to drills and has particular reference to an improved support for use with drills adapted particularly for drilling lenses and the like.

One of the principal objects of the invention is to provide a device of the character described with novel means of supporting the work to be drilled and for regulating and controlling the drill position.

Another object is to provide a novel work support for a device of the character described embodying means which may be quickly and easily adjusted for determining the accurate drill position at which the perforation is to be formed in the work.

Another object is to provide a work support with adjustable portions which may be simply and quickly operated for determining the accurate position at which the drill is to engage the work during the drilling of a hole therein and which will readily accommodate itself to work of different contour shapes.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings and it will be apparent that many changes may be made in the various details of construction and arrangement of parts herein described without departing from the spirit of the invention as expressed in the accompanying claims. I, therefore, do not wish to be limited to the exact details of construction and arrangement of parts shown and described as the preferred forms only have been given by way of illustration.

Referring to the drawings:

Fig. 1 is a front perspective view of the device embodying the invention;

Fig. 2 is an enlarged perspective view of the work support and associated adjustable portions thereon;

Fig. 3 is an enlarged sectional view taken as on line 3-3 of Fig. 1 and looking in the direction indicated by the arrows;

Fig. 4 is a sectional view taken as on line 4-4 of Fig. 3 and looking in the direction indicated by the arrows; and

Fig. 5 is an enlarged fragmentary view taken as on line 5-5 of Fig. 1 and looking in the direction of the arrows.

Referring more particularly to the drawings wherein like characters of reference designate like parts throughout the several views, the device embodying the invention comprises a boss 6 formed on the base 7 of a conventional type lens

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drill. Said lens drill comprises an upright 8 which supports a bearing 9 having a lens drill of conventional type reciprocally supported therein. The said drill 10 is adapted to be moved in the bearing 9 by means of a hand lever 11. The operative function of the said parts above described is similar to that of Patent No. 1,370,035, issued March 1, 1921, to Jeremiah Moffitt.

The present invention is directed particularly to the work or lens support which, as shown more clearly in Figs. 2 and 3, comprises a post 12 extending upwardly of the boss 6 and on which a sleeve 13 is rotatably supported. The sleeve 13 is provided with a cone point 14 on which the lens or work 15 is adapted to be rested during the drilling operation. The sleeve 13 is provided with a collar 16 which is held in position on said sleeve by screws and the like 17. The collar 16 supports a blade spring or the like 18 which is adapted to engage a lever 19 pivotally attached to the collar 16 by a pin or the like 20. The lever 19 has a stop block 21 secured adjacent the upper end thereof and which is adapted to be engaged by the edge 22 of the lens 15 to aid in accurately positioning the lens relative to the drill 10. The lever 19 has a cam follower 23 pivotally attached thereto as illustrated at 24. The said lever 19 is provided with an adjustment screw 25 adjacent the end thereof opposed to the stop block 21. The said adjustment screw 25 is adapted to engage the side surface 26 of the cam follower 23 and functions to limit the outward movement of the cam follower relative to the lever about the pivot 24. The cam follower 23 is provided with an end 27 adapted to engage a cam member 28 carried by a finger grip member 29 which is rotatably supported on the sleeve 13. The said finger grip member 29 is provided with a circumferential inner groove 30 communicating with a circumferential outer groove 31 formed in the sleeve 13 adjacent the end thereof opposite the cone point 14. A spring lock ring 32 is snapped internally of said circumferentially grooved portions 30 and 31 respectively to retain the parts 21 and 13 in assembled relation with each other. The spring lock ring 32 is held internally of the groove 30 by means of the cam member 28 which is secured to said finger grip member 29 by screws or the like 33. The adjacent end 34 of the sleeve 13, as shown more clearly in Fig. 4, is provided with a notched portion 35 adapted to receive a projection 36 formed on the upper surface of the post 6. The notch 35 is provided with end walls 37 and 38 which are adapted to engage the projection 36 in different positions of adjustment of the sleeve

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13. The notch 35 and projection 36 function to limit the rotary movement of the sleeve 13 on the post 12.

As shown in Fig. 2 the sleeve 13 is provided with an indicator line 39 adapted to function cooperatively with a suitable scale 40 formed on the upper surface of the finger grip member 29. The indicator and scale 39 and 40 are adapted to determine the required position of adjustment of the cam member 28.

Referring more particularly to Figs. 4 and 5 the sleeve 13 is shown as being provided with a pin 41 projecting outwardly thereof between the spaced ends 42 and 43 of the spring lock ring 32. This pin 41 is adapted to hold the spring lock ring 32 against rotation internally of the circumferential groove 31 of the sleeve 13 and the tension thereof is such that when held in this manner it will cause a slight friction to be introduced between said spring lock ring 32 and the inner wall of the circumferential groove 30 of the finger grip member 29 when said finger grip member is adjusted to alter the position of the cam member 28. This friction tends to retain the finger grip member 29 and the cam member 28 in adjusted position relative to the sleeve 13. The lens or work 15 may be held in position on the cone point 14 during the drilling operation by the hand of the operator or may be supported by a suitable clamping device such as shown in the above mentioned patent and carried by a support 44 in the conventional manner.

The gist of the invention is to provide means for controlling the position of the drilled hole relative to the edge 22 of the lens whereby the said hole will be drilled at an accurate distance inwardly of said edge 22. This distance is controlled by the position at which the stop block 21 is located relative to the center line of the drill 10 or point 45 of the cone end 14. This distance is varied controlled amounts by rotating the finger grip member 29 to align the proper graduation of the scale 40 with the indicator 39. Rotation of the finger grip member 29 causes the cam 28 attached thereto to be rotated about the sleeve 13. Rotation of the cam 28 which is engaged by the end 27 of the cam follower 23 will cause the stop block 21 carried by the lever 19 to be moved inwardly or outwardly relative to the point 45, depending upon the extent of adjustment of the cam member 28. The blade spring 18 is adapted to retain the end 27 of the cam follower 23 in engagement with the periphery of the cam 28. The adjustment screw 25, which is adapted to provide a stop end 27 against which the pivotally supported cam follower 23 is adapted to engage, may be adjusted to compensate for the wearing of the end 27 of the said cam follower or edge surface of the cam during the use of the device whereby the position of movement of the stop block 21 may be made to correspond with the position indicated by the indicator 39 and related graduations of the scale 40. This is to insure that the block 21 will assume its proper adjustment when the desired scale graduation is aligned with the indicator. The said adjustment screw 25 also provides means whereby the initial accurate assembled positions of the parts may be obtained during the initial fabrication of the device.

It is particularly pointed out that the spring lock ring 32 is initially of a diameter greater than the diameter of the circumferential groove 30 so that the said lock ring has to be sprung into nested relation with said groove. The in-

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herent tendency of the spring lock ring to return to its initial groove 30 will cause the said ring to frictionally engage the inner wall of the groove. This relation of the ring and groove 30, therefore, introduces a friction binding action between said lock ring and finger grip member 29 when said lock ring is held against rotation by the pin 41.

By rotary movement of the finger grip member 29, therefore, the accurate adjustment of the position of the stop block 21 relative to the cone point 45 and longitudinal axis of the drill 10 may be quickly and easily obtained.

When the lens 15 is to be drilled, the said lens is rested on the cone point 45 with the adjacent edge thereof engaging the stop block and in this manner the position of the drilled opening will be accurately located inwardly of the edge 22 of the lens.

It is to be understood that the longitudinal axis of the drill 10 is in alignment with the longitudinal axis of the sleeve 13 with said longitudinal axis extending through the point 45 of the cone end. It is common practice to drill into the lens an amount substantially equal to half the thickness of the lens and to then turn the lens over, as shown by the dash lines 46, and complete the drilling. This is accomplished by forcing the drill downwardly by moving the lever 11 downwardly in the conventional manner.

The entire unit embodying the sleeve 13, the lever 19, the cam 28, etc., is free to rotate on the post 12 so that the surface 21 of the block engaging the edge of the lens is free to swing to the angle of the adjacent edge of the lens regardless of the shape of the contour of the lens. This movement takes place when the lens is placed on the cone end 14 and its edge is pressed into engagement with the surface of the block edge 21.

From the foregoing it will be seen that simple, efficient and economical means have been provided for accomplishing all of the objects and advantages of the invention.

Having described my invention, I claim:

1. A work support for a device of the character described, said work support comprising a sleeve-like member adapted to fit over an upright formed on said device, said sleeve-like member having an end portion on which the work is to be rested, a lever pivotally connected with said sleeve-like member having an engagement portion adjacent one end thereof located adjacent the work supporting end of the sleeve-like member, a member rotatably mounted on said sleeve-like member having a cam portion and means on said lever member for engaging said cam portion.

2. A work support for a device of the character described, said work support comprising a sleeve-like member adapted to fit over an upright formed on said device, said sleeve-like member having an end portion on which the work is to be rested, a lever pivotally connected with said sleeve-like member having an engagement portion adjacent one end thereof located adjacent the work supporting end of the sleeve-like member, a member rotatably mounted on said sleeve-like member having a cam member thereon, means on said lever member for engaging said cam portion and resilient means for urging said engagement portion into engagement with the cam member.

3. A work support for a drill having an upright post in substantial alignment with said drill, a sleeve-like member rotatably mounted on said

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post and having a work supporting end, a lever pivotally supported by said sleeve-like member and having an engagement portion on the end thereof located adjacent the work supporting end of the sleeve-like member, a cam member rotatably mounted on said sleeve-like member, means associated with said cam member and with the sleeve-like member for locating the position of adjustment of said cam member and said lever having a contact portion adapted to engage the cam member.

4. A work support for a drill having an upright post in substantial alignment with said drill, a sleeve-like member rotatably mounted on said post and having a work supporting end, a lever pivotally supported by said sleeve-like member and having an engagement portion on the end thereof located adjacent the work supporting end of the sleeve-like member, a cam member rotatably mounted on said sleeve-like member, means associated with said cam member and with the sleeve-like member for locating the position of adjustment of said cam member, said lever having a contact portion adapted to engage the cam member and resilient means for urging said contact portion into engagement with said cam member.

5. A work support for a drill having an upright post in substantial alignment with said drill, a sleeve-like member rotatably mounted on said post and having a work supporting end, a lever pivotally supported by said sleeve-like member and having an engagement portion on the end thereof located adjacent the work supporting end of the sleeve-like member, a cam member rotatably mounted on said sleeve-like member, means associated with said cam member and with the sleeve-like member for locating the position of adjustment of said cam member, said lever having a contact portion adapted to engage the cam member and resilient means for urging said contact portion into engagement with said member, said contact portion being adjustably supported by the lever.

6. A work support for a drill having an upright post, a sleeve-like member rotatably mounted on said post and having a cone shaped work supporting end, a lever pivotally connected with said sleeve-like member and having an engagement portion on the end thereof adjacent the cone shaped end, means rotatably mounted on said sleeve-like member having a cam member carried thereby and means on said lever for engaging said cam member.

7. A work support for a drill having an up-

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right post, a sleeve-like member rotatably mounted on said post and having a cone shaped work supporting end, a lever pivotally connected with said sleeve-like member and having an engagement portion on the end thereof adjacent the cone shaped end, means rotatably mounted on said sleeve-like member having a cam member carried thereby, means on said lever for engaging said cam member and an adjustable contact portion carried by said lever for engaging the cam member.

8. In a lens drill a lens support mounted to rotate substantially about the longitudinal axis of the drill, said support having a lever pivotally carried thereby, said lever having an engagement portion located adjacent the upper end of the support, and adjustable means adjacent the lower end of the support for rocking the lever on its pivot controlled amounts for altering the position of the engagement portion relative to said upper end of the support.

9. In a device of the character described, a support having a work receiving portion adjacent its upper end and having a movable bar-like member adjustably mounted thereon for movement in directions transversely of the vertical axis of the support, said bar-like member having a work engagement portion located adjacent the work receiving portion of said support, and cam means mounted on the support, said cam means being rotatable about the vertical axis of the support as a center and having its peripheral portion engaging an adjacent portion of the movable bar-like member, said peripheral portion of the cam means being defined by a plurality of different radii whereby the related position of the work engagement portion of the bar-like member to the work receiving portion of the support may be varied by rotation of the cam means.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
319,748	Rein	June 9, 1888
380,130	Minnich	Mar. 27, 1888
603,025	Lord	Apr. 26, 1898
1,222,559	Moffitt	Apr. 10, 1917
1,370,035	Moffitt	Mar. 1, 1921
1,801,222	Cayo	Apr. 14, 1931
2,222,538	Maynard	Nov. 19, 1940