April 17, 1945. W. SCHOENIGER 2,373,918

LAYOUT AND DRILL JIG

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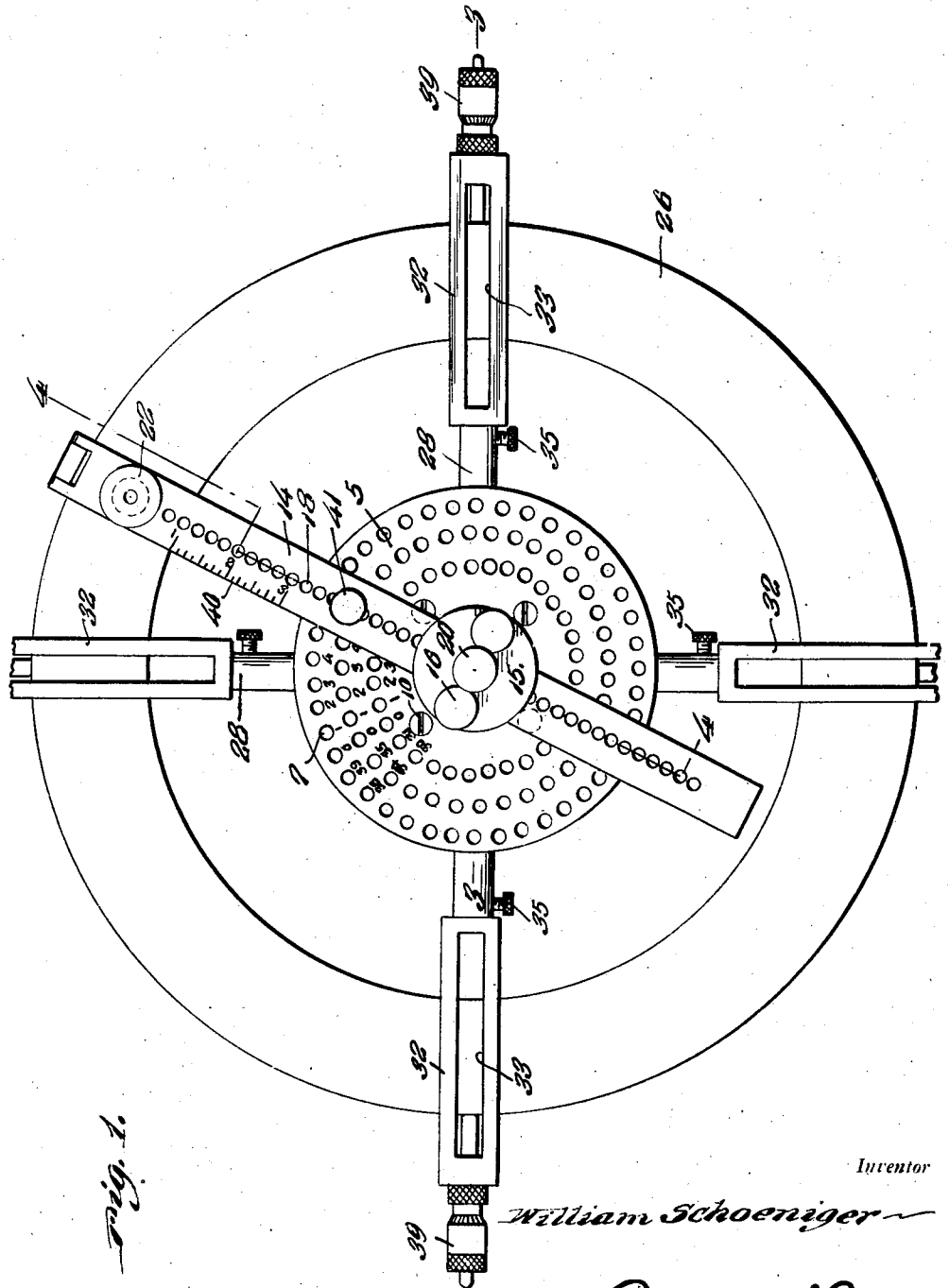


Fig. 1.

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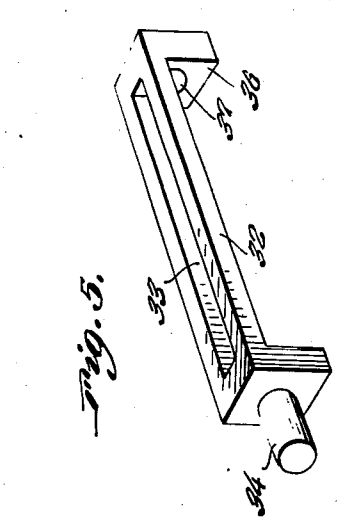


Fig. 5.

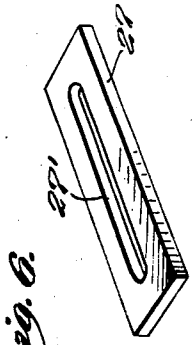


Fig. 6.

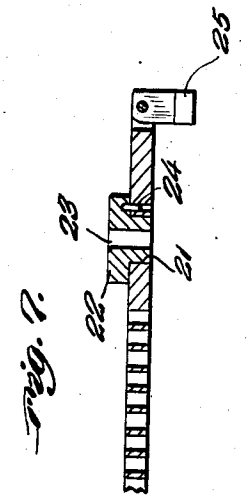


Fig. 7.

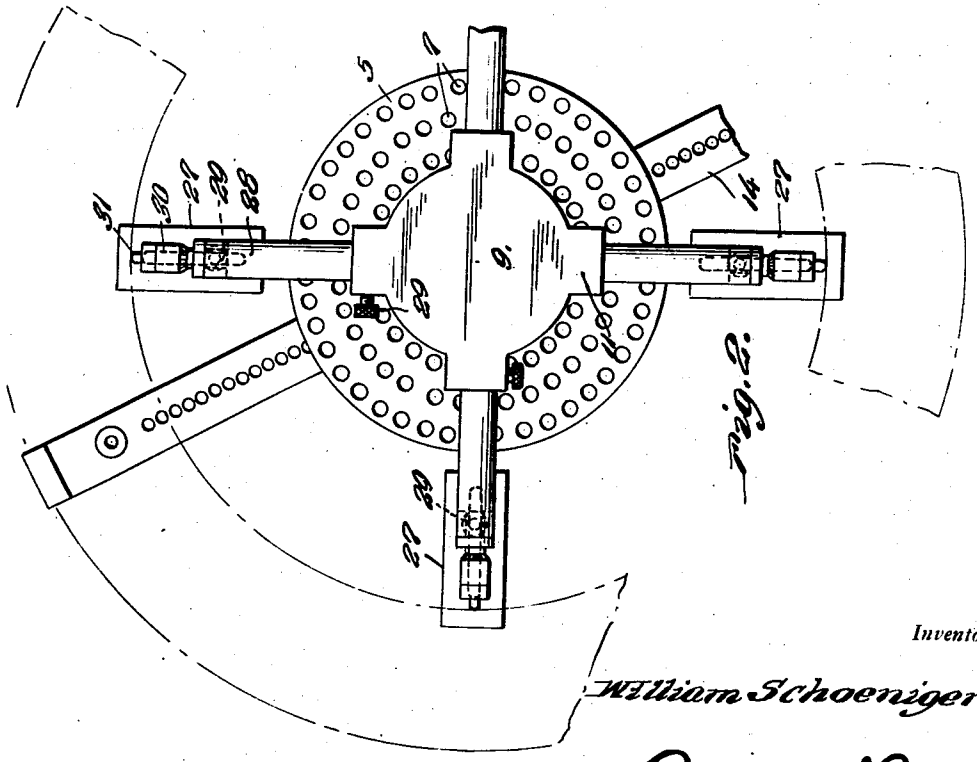


Fig. 8.

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Fig. 5.

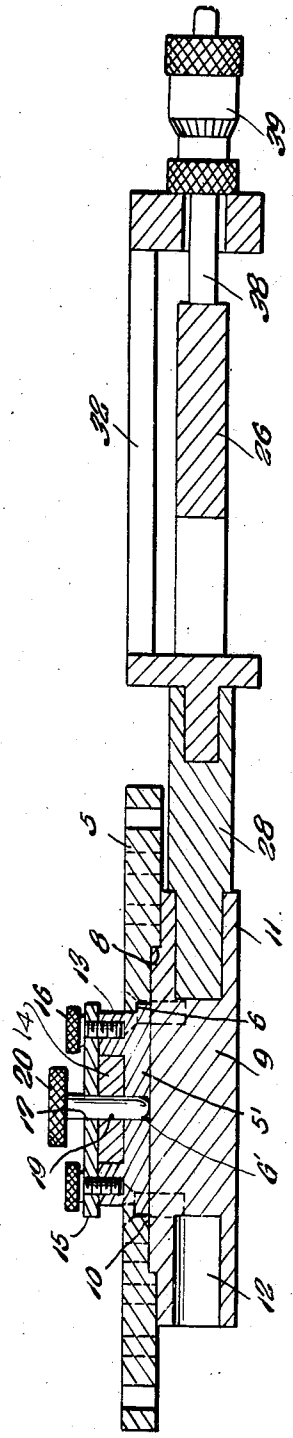


Fig. 4.

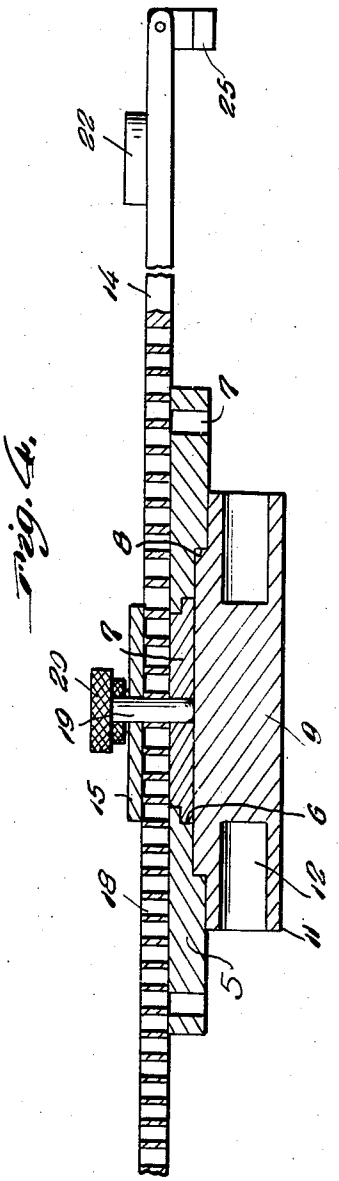


Fig. 6.



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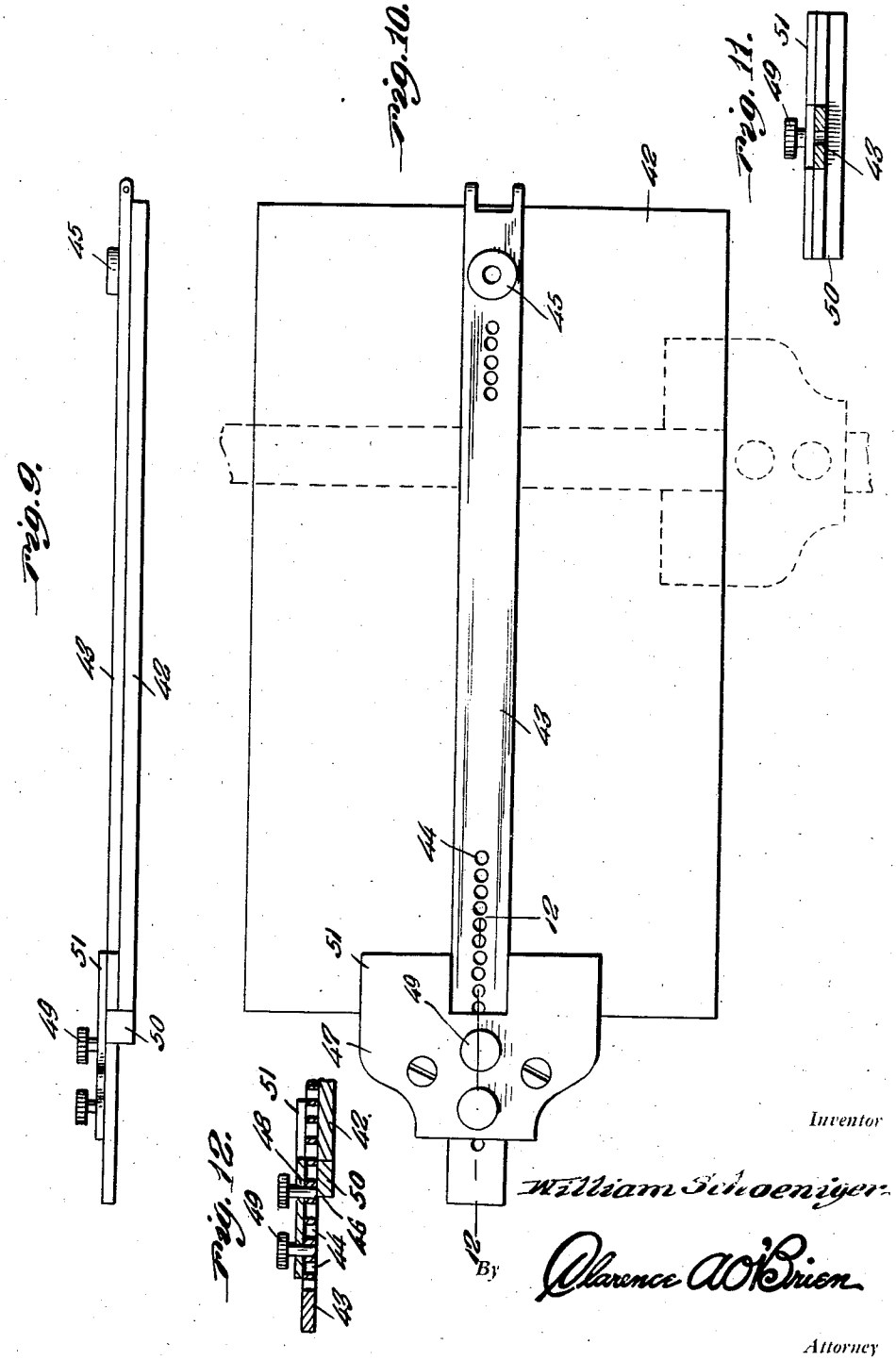
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LAYOUT AND DRILL JIG

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UNITED STATES PATENT OFFICE

2,373,918

LAYOUT AND DRILL JIG

William Schoeniger, Crichton, Ala.

Application November 17, 1941, Serial No. 419,492

6 Claims. (Cl. 77—62)

The present invention relates to new and useful improvements in layout and drilling devices for accurately spacing holes in machine parts and has for its primary object to provide a device of this character adapted for use in laying out and drilling circular work as well as rectangular or other polygonal work.

A further object is to provide a layout and drill jig of simple and practical construction, which is efficient and reliable in performance, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a top plan view, showing the outside micrometer attachments.

Figure 2 is a bottom plan view, showing the inside micrometer attachments.

Figure 3 is a transverse sectional view taken substantially on a line 3—3 of Figure 1.

Figure 4 is a similar view taken substantially on a line 4—4 of Figure 1.

Figure 5 is a perspective view of the bracket for the outside micrometer adjustment.

Figure 6 is a similar view of the plate for the inside micrometer adjustment.

Figure 7 is a fragmentary longitudinal sectional view through the bushing and outer end of the slidable drilling bar.

Figure 8 is a perspective view of the drilling bushing or guide.

Figure 9 is a side elevational view showing the drilling bar in conjunction with a rectangular piece of work.

Figure 10 is a top plan view thereof.

Figure 11 is an end elevational view of the T-head for the drilling bar shown in Figures 9 and 10 and with the bar shown in section, and

Figure 12 is a fragmentary longitudinal sectional view taken substantially on a line 12—12 of Figure 10.

Referring now to the drawings in detail and with reference particularly to the form of the invention illustrated in Figures 1 to 8, inclusive, the numeral 5 designates a disk member having a centrally disposed undercut opening 6 formed therein and in which is rotatably positioned a hub 5' having its edges conformably fitted in the opening. The hub is formed with a central opening 6' and the disk is formed with a plurality of concentrically arranged rows of openings 7, the rows preferably being three in number, the outer row containing forty openings consecutively numbered, the intermediate row comprising thirty-six openings consecutively numbered and the inner row comprising thirty-two openings consecutively numbered as shown in Figure 1 of the drawings.

The openings of each row are numbered "0" upwardly and the "0" openings of each row are disposed in direct radial alignment with each other from the central opening 6' and said "0" openings are used as the starting point in operating the jig.

The bottom of the disk 5 is formed with a shallow circular recess 8 within which is fitted a disk-like base plate 9 and secured thereto by means of screws 10, the base plate holding the hub 5' in position against the underside of the disk 5.

The peripheral edges of the base plate 9 are formed with a plurality of extensions 11 having sockets 12 formed in the edge thereof, the extensions 11 being spaced ninety degrees from each other on the edge portion of the base plate 9 as shown to advantage in Figure 2 of the drawings.

Rising from the upper surface of the disk 5 are a pair of guide blocks 13 having one edge disposed in spaced parallel relation with each other and between which is slidably positioned a drill guide bar designated at 14, the bar being of rectangular shape in cross-section. The bar is secured in position between the guide blocks 13 by means of a cap plate 15 secured to the guide blocks by set screws 16. The cap plate 15 is formed with a central opening 17 in alignment with the central opening 6' of the disk 5 and the bar 14 is formed with a plurality of longitudinally spaced openings 18 adapted for selectively registering with the openings 6' and 17 for receiving a retaining pin 19 having a knurled head 20.

The bar 14, adjacent its outer end, is formed with an opening 21 within which is removably fitted a guide bushing 22 having a bore 23 extending therethrough for receiving a drill, the bushing being secured against movement in the bar by means of a retaining pin 24.

Pivoted to the outer end of the bar 14 is a hinged block 25 adapted for swinging under the bar 14 to take up any space between the bar and the work designated at 26 when a clamp (not shown) is used in drilling, the work in the present instance being represented as a ring member.

When the inner periphery of the work 26 is finished for layout purposes, an internal micrometer adjustment is provided and comprises a pin

28 for each extension 11 and having one end positioned in the socket 12. A plate member 27 having a slot 27' formed therein is positioned on each pin 28 and secured thereto by means of a set screw 29 inserted in the slot. In the other end of the pin 28 is secured the micrometer 30 of conventional construction and having its outer extension 31 adapted for engaging the inner periphery of the work as shown to advantage in Figure 2 of the drawings. The slot 27' enables the operator to read the micrometer.

Where the outer periphery of the work 26 is finished for layout purposes, a plurality of micrometer adjusting supports of a form designated at 32 are provided, each support 32 likewise having a longitudinal slot therein designated at 33 and is formed at its inner end with a stud 34 adapted for insertion in the outer end of the pin 28 and is secured thereto by a set screw 35. The outer end of the support 32 is formed with a down-turned flange 36 having an opening 37 therein and in which is freely positioned the pin 38 carried by the micrometer 39 of conventional construction for engaging the outer periphery of the work.

One edge of the upper surface of the bar 14 is formed with graduations 40 in inches and the openings 18 of the bar are adapted to align with one of the openings 7 of the disk 5 in accordance with a predetermined number and positioning of openings to be formed in the work and the aligned openings 18 and 7 are then retained in position by means of a retaining pin 41. The guide bushings 22 may be provided in sets having bores of different diameters to accommodate bits of various sizes in accordance with the size of hole to be drilled.

In the form of the invention illustrated in Figures 9 to 12, inclusive, the layout and drill jig is shown in use upon a work of rectangular shape as shown at 42, the drilling bar being indicated at 43 and is provided with the longitudinally spaced openings 44 therein, as heretofore explained, as well as being provided with the guide bushing 45.

The bar is slidable in a slot 46 in a crosshead 47 having a pair of openings 48 therein adapted for aligning with the openings 44 and provided with retaining pins 49 for securing the crosshead in adjusted position relative to the bar. The underside of the clamping head 48 is formed with a stop 50 adapted for abutting the adjacent edge of the work, as shown to advantage in Figure 12 of the drawings and wings 51 overlie the upper surface for the work and adapted for engagement by a conventional form of clamping device (not shown) for receiving the crosshead against movement on the work.

It is believed the details of construction, operation and advantages of the device will be readily understood from the foregoing without further detailed explanation.

Having thus described the invention what I claim is:

1. A layout and drill jig comprising a disk having a central opening and a plurality of rows of concentrically arranged openings, a drilling guide bar, means engaging the openings for securing the bar to the disk in radially extending relation thereto, a drill guide carried at the outer end of the bar, and means projecting radially from the disk for centering the disk relative to work to be drilled.

2. A layout and drill jig comprising a drilling guide bar having a plurality of longitudinally spaced openings, a rotatable member slidably receiving one end of the bar, a stationary member having concentric rows of openings adapted to register with the openings of the bar, a retaining pin inserted in aligned openings in the bar and said stationary member for securing the first-named member against rotation, means for centering the members with respect to circular work to be drilled, and a drill guide at the other end of the bar.

3. A layout and drill jig comprising a drilling guide bar having a plurality of longitudinally spaced openings, a base, a disk secured on the base, a hub rotatable in the disk, means slidably securing the bar to the hub in radially disposed relation, said disk having a plurality of concentric rows of openings adapted to register with the openings of the bar, a retaining pin inserted in aligned openings in the bar and disk for securing the hub against rotation, means for centering the disk and hub with respect to circular work to be drilled, and a drill guide at one end of the bar.

4. A layout and drill jig comprising a drilling guide bar having a plurality of longitudinally spaced openings, a base, a disk secured on the base, a hub rotatable in the disk, means slidably securing the bar to the hub in radially disposed relation, said disk having a plurality of concentric rows of openings adapted to register with the openings of the bar, a retaining pin inserted in aligned openings in the bar and disk for securing the hub against rotation, micrometer supporting pins projecting radially from the base and adapted to support micrometers thereon in a position for centering the disk and hub relative to circular work to be drilled, and a drill guide at one end of the bar.

5. A layout and drill jig comprising a drilling guide bar having a plurality of longitudinally spaced openings, a base, a disk secured on the base, a hub rotatable in the disk, a guide on the hub slidably receiving the bar, means adjustably securing the bar in the guide in a radially disposed position, said disk having a plurality of concentric rows of openings adapted to register with the openings of the bar, a retaining pin inserted in aligned openings in the bar and disk for securing the hub against rotation, means for centering the disk and hub with respect to circular work to be drilled, and a drill guide at one end of the bar.

6. A layout and drill jig comprising a drilling guide bar having a plurality of longitudinally spaced openings a base, a disk secured on the base, a hub rotatable in the disk, a guide on the hub slidably receiving the bar, means adjustably securing the bar in the guide in a radially disposed position, said disk having a plurality of concentric rows of openings adapted to register with the openings of the bar, a retaining pin inserted in aligned openings in the bar and disk for securing the hub against rotation, radially disposed pins carried by the base, micrometer supporting members removably carried by the pins and adapted for supporting micrometers in a position for centering the disk and hub relative to circular work to be drilled, and a drill guide at one end of the bar.

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