Aug. 23, 1949. C. A. PIERCE 2,479,774

DRILL BIT CENTERING ATTACHMENT

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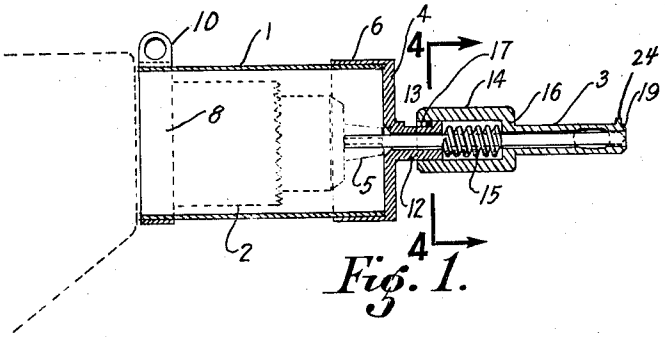

Fig. 1.

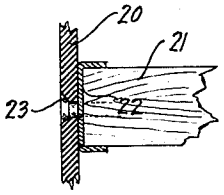

Fig. 2.

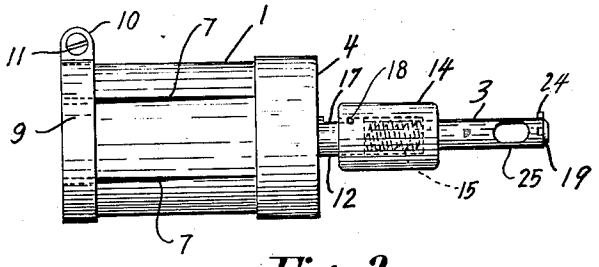

Fig. 3.

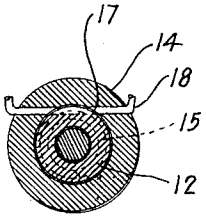

Fig. 4.

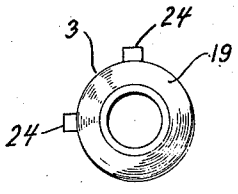

Fig. 5.

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DRILL BIT CENTERING ATTACHMENT

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4 Claims. (Cl. 77—55)

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The present invention relates to improvements in a centering attachment for a drill bit and its principal object is to facilitate the centering of a drill bit where the latter is used for drilling through a countersunk hole into an object disposed behind the hole.

My invention is intended particularly for use in connection with portable electrical drills, although it may be adapted for other uses.

In assembling operations it frequently becomes necessary to secure brackets, plates, hinges or the like, upon an object by means of screws, and such brackets, plates, or hinges are usually preformed with countersunk holes through which screws may be passed into the object, the heads of the screws being seated in the countersinks of the holes when the operation is completed.

The application of the screw usually requires pre-drilling of a hole for the same, and this pre-drilling operation usually is most conveniently carried out with the bracket in its intended place by drilling through the countersunk hole.

Where a plain drill and drill bit are used it is often difficult to properly center the drill bit since as a rule, during the beginning of the drilling operation, the tip of the drill bit tends to move before it obtains a bite, particularly where the material to be drilled is made of metal.

The operator also often finds difficulty in holding the drill perpendicular with respect to the object to be drilled, which often results in a slanting hole rather than a perpendicular one.

In the present invention it is proposed to facilitate the operation by providing an attachment which automatically centers the drill bit with respect to the countersink, and which furthermore provides means to facilitate the proper perpendicular positioning of the drill bit.

Further objects and advantages of my invention will appear as the specification proceeds and the novel features of my invention will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawing, in which

Figure 1 shows a longitudinal section through my attachment as applied to a portable electrical drill, the latter being shown in dotted lines;

Figure 2 an explanatory view illustrating the situation in which my attachment is to be used;

Figure 3 a side view of my attachment;

Figure 4 a section taken along line 4—4 of Figure 1; and

Figure 5 an enlarged end view of the attachment.

While I have shown only the preferred form

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of my invention, I wish to have it understood that various changes and modifications may be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawing in detail, my attachment comprises in its principal features a holding member or guard 1 adapted for fastening to a fixed portion of the drill so as to surround the chuck indicated at 2 and a sleeve 3 retractable upon the drill bit and slidable with respect to the holding member.

The holding member is cylindrical in form and of a length sufficient to bring its closed end 4 just outside the jaws 5 of the drill when the latter are in their most projected positions. The closed end of the holding member is preferably formed by a cap 6 having a relatively heavy end, and the cylindrical portion extending beyond the cap is preferably slit along various lines as shown at 7 so that the inner end of the holding member may be engaged over a collar 8 usually found in portable drills at the base of the chuck. The material of the cylindrical holding member may be sufficiently springy for clamping upon the collar due to its elasticity, but if desired a special clamp 9 may be provided for firmly securing the inner end of the holding member upon the collar. The clamp may be in the form of a split ring having parallel ears 10 adapted to be secured upon one another by means of a screw 11.

The holding member has a reduced axial extension 12 projecting beyond the cap, this extension being cored to a diameter substantially corresponding to that of the drill in connection with which the attachment is to be used. The inner end of the bore is countersunk as shown at 13 to facilitate insertion of the tip of the drill bit.

The sleeve 3 is dimensioned for an easy sliding fit upon the outer end of the drill bit and has an enlarged rear section 14 slidable upon the extension 12. The sleeve is normally urged outward by a spring 15 interposed between the outer end of the extension and a shoulder 16 formed at the juncture of the sleeve and the enlarged rear section.

The extension 12 is provided with a flattened section 17 and the enlarged rear portion of the sleeve is anchored to the extension by means of a cotter pin 18 passed through holes in the enlarged rear section of the sleeve and slidable longitudinally over the flat section of the extension. This cotter pin limits the outward movement of the sleeve 3 under the influence of the

spring 15 while allowing of a certain amount of retracting movement, and also holds the sleeve against rotary movement. When the limit of the outward movement is reached, the extreme outer end of the sleeve 3 is substantially in alignment with the tip of the drill. The outer end of the sleeve is tapered at 19 to fit the countersink with respect to which the drill bit is to be centered.

Figure 2 illustrates the situation in connection with which my attachment is to be used, the member 20 representing a bracket to be secured upon a board 21 having a metal flange 22 around the same. The bracket is formed with a countersunk hole 23 having the same shape as the tapered end of the sleeve so that when the end of the sleeve is seated in the countersunk hole 23 the drill bit will be automatically centered with respect to the hole in the bracket. Immediately adjacent the tapered end of the sleeve I provide a pair of gauge members 24 of suitable form, spaced circumferentially by about 90°, and having outer faces adapted to bear upon the rim section of the counterbore 23. The operator can thus easily gauge for perpendicular position by observing the two gauges. If both of the gauges contact the rim the drill is properly positioned.

Suitable holes 25 are provided in the sleeve near its operating end to allow shavings to escape.

My attachment may be secured upon the drill very quickly by merely pushing the holding member over the collar 8 and securing the clamp 9, if one is used. The attachment is then ready for operation. To drill the desired hole the operator seats the extreme tapered end 19 of the sleeve 3 in the counterbore and checks against the two gauge members 24 for correct perpendicular position. He then starts operation of the drill, and the drill bit advances into the material while the sleeve retracts sufficiently to allow of the advance.

I claim:

1. In combination, a drill comprising a housing, a chuck and a drill bit, a guard for the chuck attached to the housing having an extension concentric on the drill bit, and a sleeve retractable on the extension and having an end shaped for seating in a counterbore for centering the drill bit the sleeve having gauge means bearing upon the rim of the counterbore for indicating axial alinement of the drill bit with the counterbore.

2. In combination, a drill comprising a housing, a chuck and a drill bit, a guard for the chuck attached to the housing having an extension concentric on the drill bit, and a sleeve retractable on the extension and having an end shaped for seating in a counterbore for centering the drill bit, the sleeve and the extension having cooperative means for urging the sleeve outward, for limiting the outward movement and for holding the sleeve against rotation and the sleeve having circumferentially spaced gauge members bearing upon the rim of the counterbore for indicating axial alinement of the drill bit with the counterbore.

3. An attachment for centering a drill bit with respect to a counterbore comprising a sleeve having an end shaped for seating upon the counterbore, and means for retractably mounting the same upon the free end of the drill bit, the sleeve having gauge means bearing upon the rim of the counterbore for indicating axial alignment of the drill bit with the counterbore.

4. An attachment for centering a drill bit with respect to a counterbore comprising a sleeve having an end shaped for seating upon the counterbore, and means for retractably mounting the same upon the free end of the drill bit, the sleeve having circumferentially spaced gauge members bearing upon the rim of the counterbore for indicating axial alignment of the drill bit with the counterbore.

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