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D. D. PURVIS

2,486,363

COMBINATION DRILL AND BRUSH

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Fig. 1

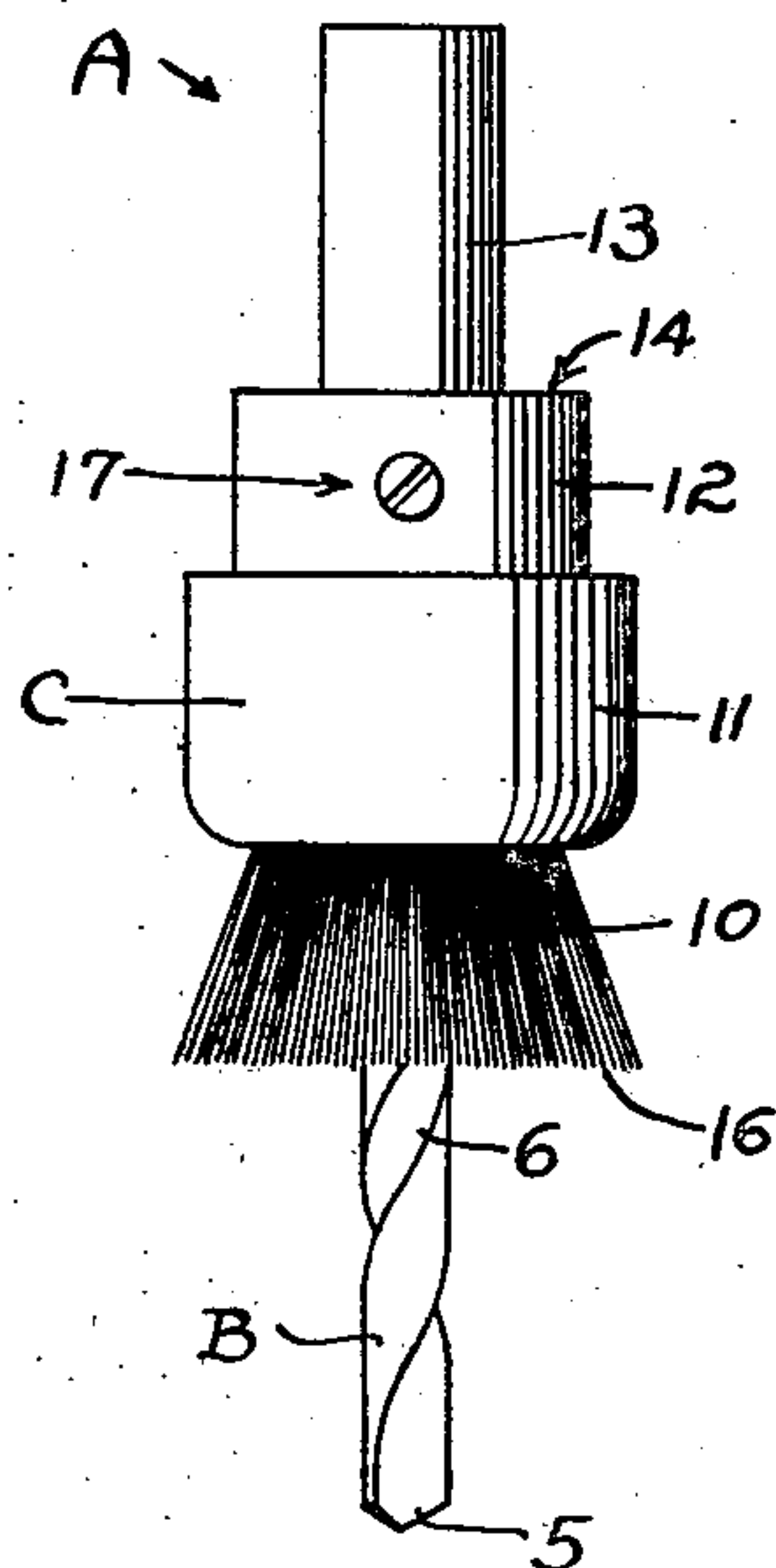


Fig. 2

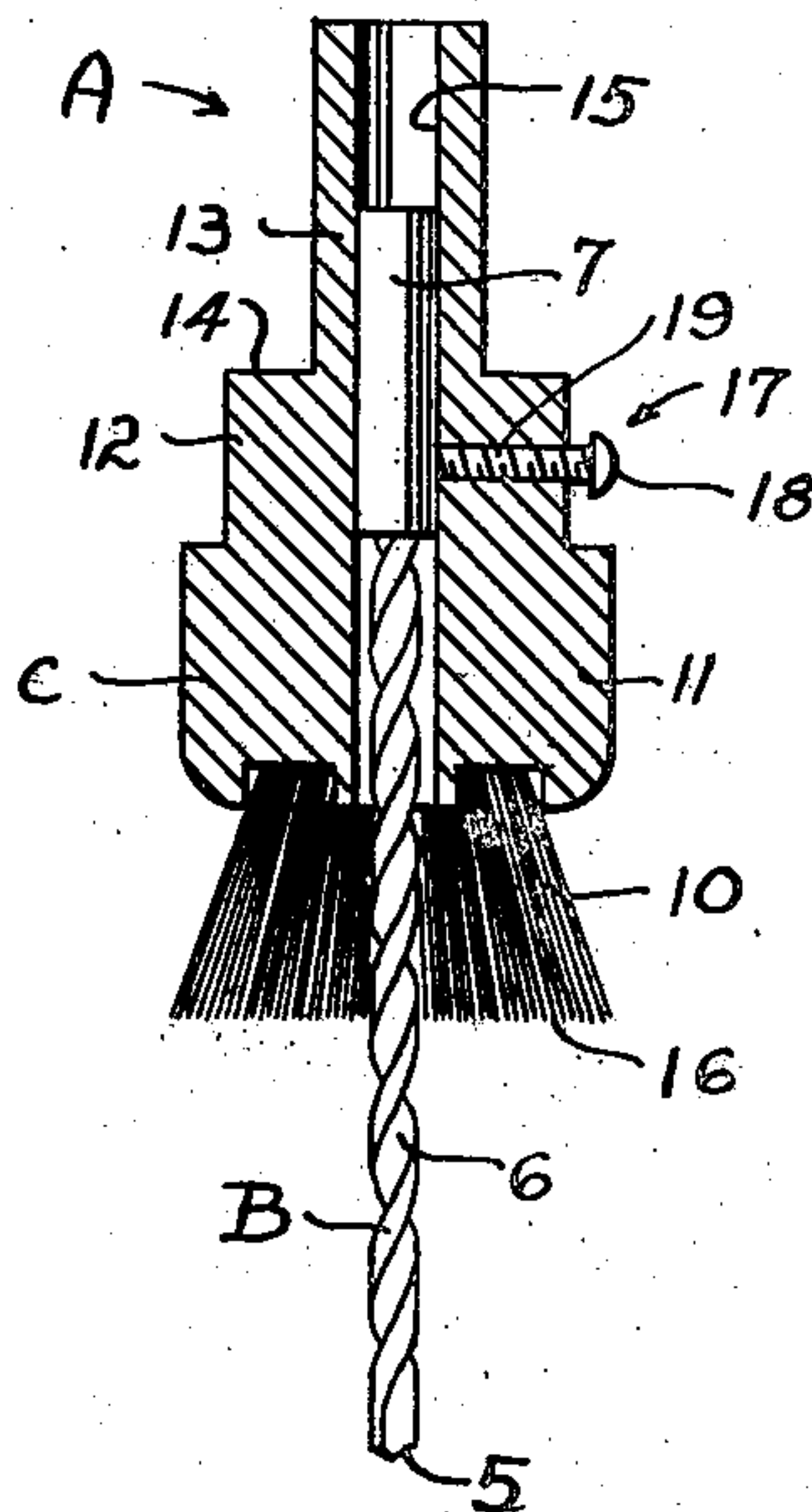


Fig. 3

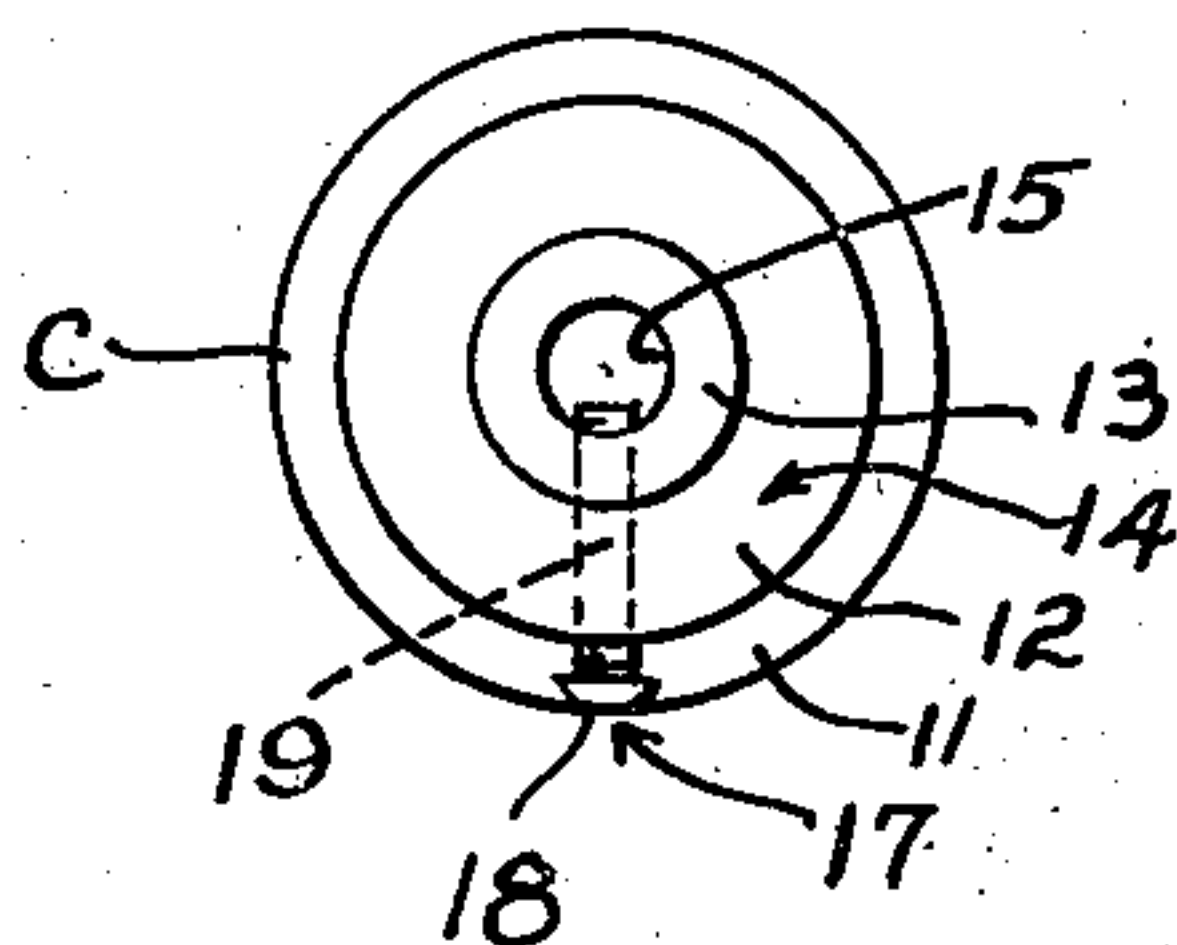
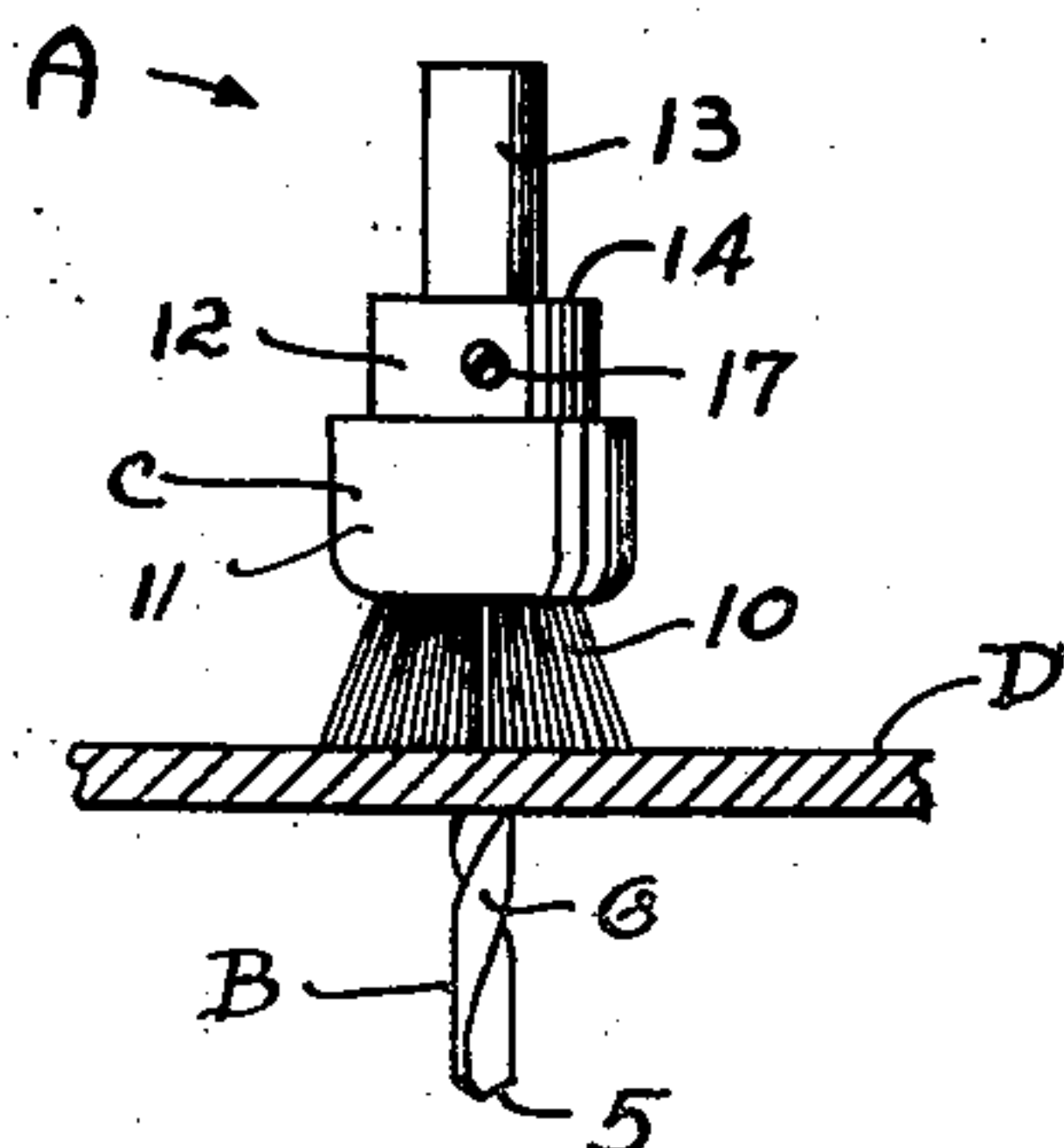


Fig. 4



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## UNITED STATES PATENT OFFICE

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## COMBINATION DRILL AND BRUSH

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4 Claims. (Cl. 77—65)

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This invention relates to combination tools and cleaners, and more specifically to a combination drill and brush.

In drilling holes, the material removed by the drill may accumulate around the hole and, if a lubricant is employed to assist in drilling, a portion of this, too, may deposit about the mouth area of the hole. Both the material and the deposit of lubricant generally must be removed and the area burnished before subsequent operations (as riveting) are undertaken. It is common practice to drill and then, after removing the drill, to wipe or brush the surface, adjacent the drilled hole, to remove material (chips) and lubricant and burnish the surface, thus entailing two operations.

An important object of the invention is to provide a novel combination drill and brush or cleaner which will remove chips and the like as well as lubricant from the mouth area of the hole and burnish this area, at the same time that the hole is being completed.

Another important object is to provide a brush having a hollow stem portion adapted to receive a portion of a drill so disposed that the drill point will extend from one end of the hollow stem portion of the brush and the other portion (shank) of the drill from the opposite end of the hollow stem portion.

Still another object is to provide a brush having a hollow stem portion and means to adjustably position the brush along the drill.

Yet another object is to provide a brush having a portion adapted to receive drill shanks of various sizes.

Other objects and advantages of the invention will be apparent during the following detailed description of the invention, taken in connection with the accompanying drawing, forming a part of this specification, and in which drawing:

Figure 1 is an elevation of the combination tool and cleaner, including a drill of one size.

Figure 2 is a vertical section through the cleaner of the combination, with a drill of another size attached thereto.

Figure 3 is a top plan of the cleaner.

Figure 4 is an elevation, on a reduced scale, somewhat like the showing in Figure 1, but illustrating an application of the combination tool and cleaner.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the novel combination tool

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and cleaner is designated as A, the tool as B and the cleaner carried thereby as C. A workpiece being drilled is designated as D.

Preferably, the combination tool and cleaner A is wholly of metal, although other suitable material or materials may be employed.

The tool B is shown as a means constructed and arranged to remove material from below the surface of a workpiece, and is illustrated as a conventional drill, having a pointed end 5, a helically grooved portion 6 leading therefrom to a stem or shank portion 7.

As for the cleaner C, this is shown as a brush having bristles 10, and a body preferably comprising a bristle-holding head portion 11, an intermediate portion 12 extending from the end thereof opposite from the end from which the bristles protrude, being, preferably, of somewhat reduced width over the width of the portion 11, and a stem portion 13 extending from the portion 12 and being of less width than the width of the intermediate portion 12, so that a shoulder 14 is provided at the juncture of the portions 12 and 13. Extending through the portions 11, 12 and 13 is a drill stem-accommodating opening or bore 15. Because of this bore 15, the bristles do not extend to the longitudinal axis of the cleaner C and form an opening, from their outer ends 16 to the bristle-holding head portion 11, where the opening is, of course, continued as the bore 15. However, the bristles extend close to the inserted drill, as is apparent in Figure 2.

Preferably, the bristles 10 are of wire and should be stiff.

A suitable means 17 is provided to secure the tool B to the cleaner C, preferably in a detachable connection. This may comprise a set screw 18, with its screw-threaded shank 19 extending radially through the wall of one of the portions, preferably the portion 12, with this portion provided with a screw-threaded bore from its outer face to the longitudinal bore 15. The free, inner end of the set screw 18, is, of course, adapted to frictionally contact the shank portion 7 of the drill.

In the case of drills having long stems, the operator may attach the combination tool to the drill press chuck by either the stem protruding from the end of the portion 13, or, if the fit of the drill stem and wall of the bore 15 is a snug one, he may attach the portion 13 to the chuck, with the ends of the jaws of the latter abutting the shoulder 14.

Obviously, with the means 17 provided, a drill may be replaced by another (either by a sharp



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drill or a drill adapted to bore a larger hole or one adapted to bore a smaller hole) and the extent the helically-grooved portion 6 extends beyond the ends 16 of the bristles 10 may be adjusted.

With the use of the novel tool A, the hole may be bored and the mouth area adjacent the hole cleaned and burnished in one operation. It is also now obvious that carelessness on the part of the burnisher (following the driller) who may fail to burnish the area or areas adjacent one or more of a large number of drilled holes, will be avoided since, with the use of the novel combination tool herein disclosed, every hole drilled will have its mouth area cleaned and burnished ready for the next operation (such as riveting).

While a conventional drill is shown as the tool, it is obvious that the same may be a reamer.

Various changes may be made to the form of the invention herein shown and described without departing from the spirit of the invention or scope of the claims.

What is claimed is:

1. In a tool, means for drilling a hole in a workpiece and causing the material removed from the hole to move to the surface of the workpiece, including a drill having a grooved portion and a shank portion, and means carried by said first means to clean said material from said surface adjacent said hole after said material reaches said surface including a brush having a body and bristles with said grooved portion extending outwardly of said bristles and said body secured to said shank portion.

2. In a tool, means for drilling a hole in a workpiece and causing the material removed from the hole to move to the surface of the workpiece, including a drill having a grooved portion and a shank portion, and means carried by said first means to clean said material from said surface adjacent said hole after said material reaches said surface and burnish said surface adjacent said

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hole including a brush having a body and stiff bristles with said grooved portion extending outwardly of said bristles and said body secured to said shank portion.

3. In a tool, means for drilling a hole in a workpiece and causing the material removed from the hole to move to the surface of the workpiece, including a drill having a grooved portion and a shank portion, means to clean said material from said surface adjacent said hole after said material reaches said surface, including a brush having a body provided with a longitudinal bore and a portion having an outwardly-extending, chuck jaws-abutting shoulder, and bristles extending from said body, surrounding at least a part of said grooved portion, with said shank portion extending into said bore, and means to detachably secure said shank portion to said body.

4. In a tool part, a body including a head portion, an intermediate portion extending therefrom, with one of said portions being of greater diameter than the other, whereby a chuck jaws-abutting shoulder is provided, a drill shank-accommodating stem portion extending from the intermediate portion, and a longitudinal opening extending through said head and intermediate portions and into said stem portion, and bristles carried by said head portion and extending therefrom in a direction opposite to the direction in which said stem portion extends from said intermediate portion, said bristles falling short of the axial center of said head.

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#### REFERENCES CITED

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

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