Nov. 21, 1944. R. T. ROYE 2,363,085

GUIDE BUSHING FOR DRILLS

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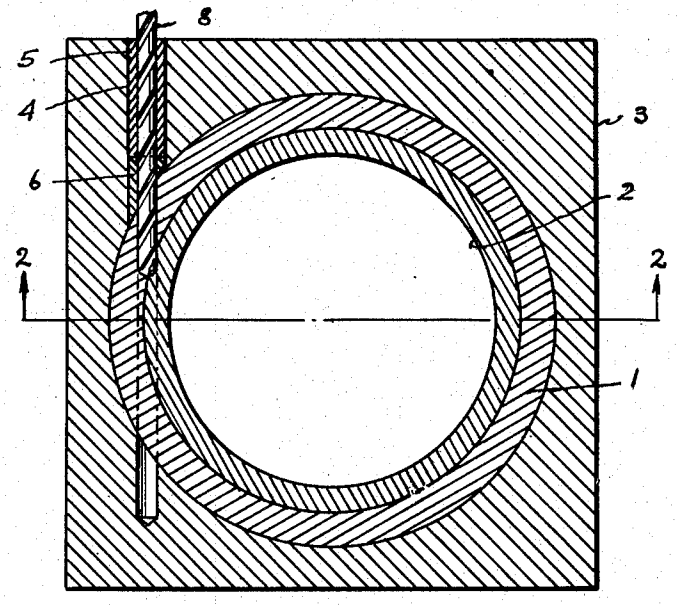


Fig. 1.

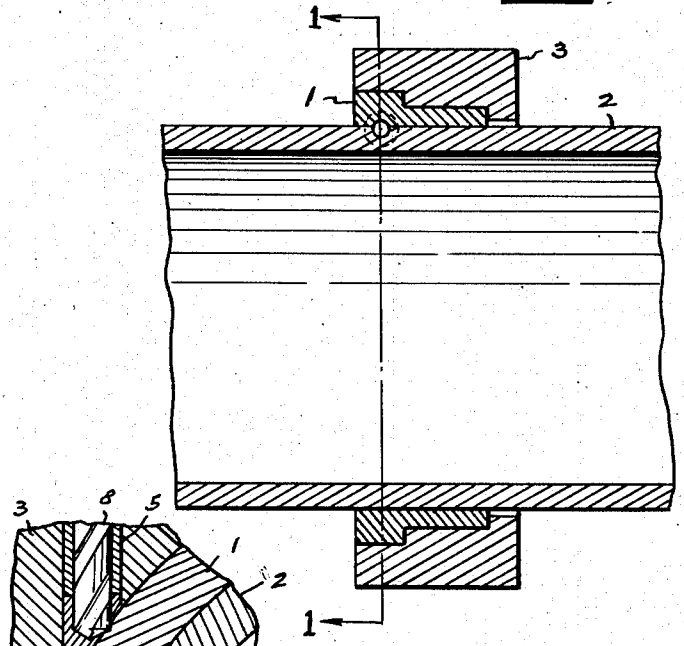


Fig. 2.

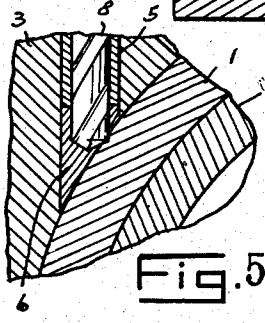


Fig. 5.



Fig. 4.

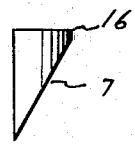


Fig. 3.

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GUIDE BUSHING FOR DRILLS

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4 Claims. (Cl. 77—62)

This invention relates to a guide bushing for drills.

An object of the invention is to provide a novel type of guide bushing adapted to be inserted into a suitable fixture and provided for guiding a drill which operates through the bushing.

The type of bushing herein described is specially useful to prevent deflection of the drill in case the drill contacts the surface of the work at other than a right angle.

A further object of the invention is to provide a bushing of the character described which is sectional so that only the section of the bushing subjected to the greatest wear may be discarded, when worn, and the remaining portion of the bushing may be re-used for an indefinite length of time.

With the above and other objects in view the invention has particular relation to certain novel features of construction, arrangement of parts and use, an example of which is given in this specification and illustrated in the accompanying drawing wherein:

Figure 1 shows a cross sectional view of the work and fixture showing the drill bushing in section with the drill therein, taken on the line 1—1 of Figure 2.

Figure 2 shows a sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a side elevation of the detachable solid end of the bushing.

Figure 4 shows an end view of said section, and

Figure 5 shows an enlarged, fragmentary, sectional view taken on the line 1—1 of Figure 2.

Referring now more particularly to the drawing, wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates a tubular fitting adapted to be fitted over a cylindrical part 2, such, for example, as a gun barrel.

It is contemplated that a key way will be drilled through said parts to receive a pin, or key, to fasten the fitting 1 immovable on the barrel 2. This key way will be bored partly in the fitting and partly in the barrel as illustrated by dotted lines in Figure 1. In producing these parts in quantity it is very important that these bores or key ways be accurately drilled so that the fittings 1 will be interchangeable and when fitted on any barrel 2, the key ways will precisely aline.

It is contemplated that when the bore, or key way, has been completed, a pin or key will be driven into the bore and its ends riveted so as to secure the parts together.

In drilling the bore or key way a fixture 3 is fitted over the work. This fixture has a bore 4 to receive a bushing. The bushing is made of very hard material and at the present time is formed of one piece with a longitudinal bore entirely therethrough to receive the drill and with its inner end tapered to fit against the surface of the work. In practice, however, it has been found that when that type of bushing is used there will be a slight deflection of the work, that is, in the event said surface is at other than a right angle to the axis of the drill; and this deflection will vary somewhat as these key ways are drilled depending on variations in the hardness of the material of the work; and furthermore this deflection of the drill point causes wear and the enlargement of the inner end of the bore through the drill bushing so that the bushing must be discarded and a new one used for each bore, or key way drilled.

In the present invention the drill bushing is made sectional, the outer section being tubular and indicated by the numeral 5 and the inner section 6 being initially solid.

As clearly indicated in Figures 1 and 3, the inner section has its inner end formed with a tapering face 7 to fit against the external surface of the fitting 1.

The numeral 8 designates the drill which is to be driven in any suitable manner.

In operation the parts are assembled as shown in Figure 1 and the drill is inserted through the bushing section 5 and as it is rotated it will form a bore through the solid section 6. As is illustrated in Figure 5, the cutters of the drill will cut through the face 7 and start the bore into the fitting 1 before the point of the drill has completed the bore through the solid section of the fitting and this solid section 6 will hold the drill in a true course, and will prevent its deflection, until the bore has been started in the fitting. The bore or key way may then be completed without any deflection of the drill and all of the bores will be precisely alike.

After one bore has been completed and another is to be drilled, the inner section 6 may be discarded and another solid section substituted for it and the outer section 5 of the bushing may be re-used. It is standard practice now, when a one piece bushing is used, to discard the entire bushing, on account of slight wear and use a new bushing for each bore or key way drilled.

The drawing and description are illustrative only, while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. A guide bushing for drills comprising an outer tubular section and an inner solid section.

2. A guide bushing for drills comprising an outer tubular section and an inner solid section whose inner end is diagonal.

3. A guide bushing for drills comprising two abutting sections of approximately the same transverse diameter, the outer section being tubular and the inner section being solid, the abutting end faces of the sections being at substantially right angles to the longitudinal axis of the bushing and the inner end face of the solid section being diagonal to said axis.

4. The combination with a fixture having an approximately circular work receiving opening and having a bore through the fixture extending into the opening and whose axis is on a chord of the circle defined by said opening, of a guide bushing for a drill in said bore, said bushing being formed of a tubular outer section and a solid inner section, the inner end of said inner section being tapered and being approximately flush with the wall of said opening.

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