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JIG-APPLIANCE BUSHING

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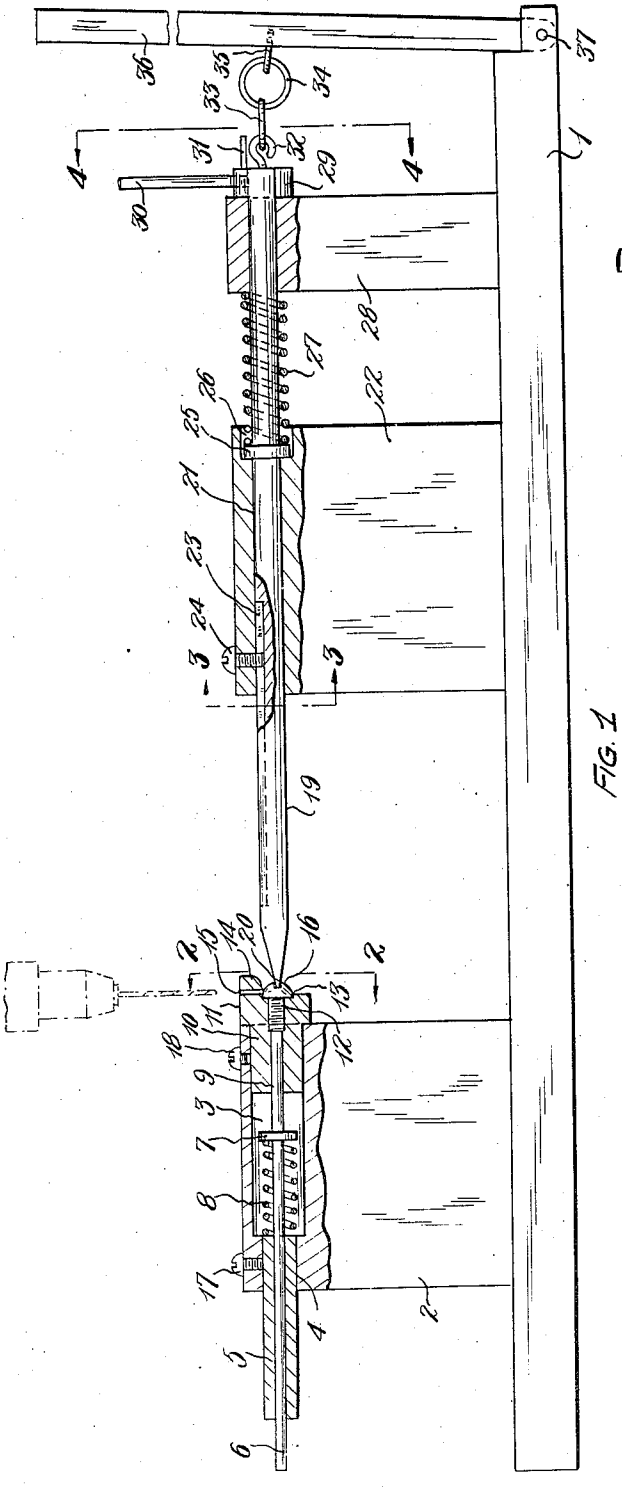


FIG. 1

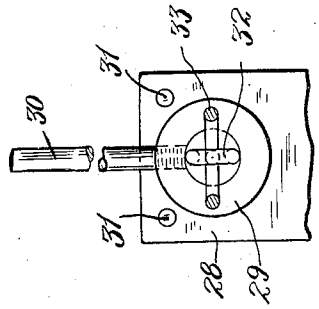


FIG. 4

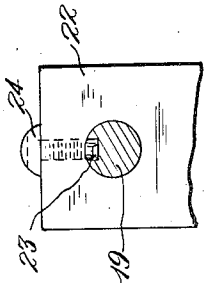


FIG. 3

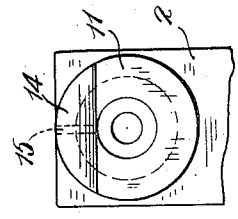


FIG. 2

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JIG-APPLIANCE BUSHING

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8 Claims. (Cl. 77—62)

My invention pertains to a jig-appliance bushing.

Experience as a mechanic and machinist has brought me familiarity with many shop appliances, including drill-guiding jigs hitherto in common use and comprising an overhanging extension projecting horizontally from a standard fixed to a drill press and provided with a vertical drill-guiding bore usually through a detachable part apt to loosen or at least to vibrate with consequent lack of drilling precision.

The object of my invention is to extend utility and improve facility of use while attaining greater reliability by providing varisized bushings which, though removably mounted in a drill press fixture, are much more firm and each of which is integrally provided with an overhanging, perforated flange. The horizontal bores in the bushings respectively, may vary in size and shape and likewise the diameter of the vertical, drill-guiding bore in each. Means is provided for securing the bushings, as by the illustrated set screw, and in axial alinement with said bushing are a pair of reactingly mounted plungers, one being adapted firmly to hold a workpiece (cap screw or bolt) and the other to dislodge the latter after the drilling operation and release of the pressure of the first plunger. As exemplified, the outer end of the bushing bore is slightly filleted and the perforated drill-guiding flange is of segmental shape to insure adequate rigidity.

Adverting to the drawing—

Figure 1 is an elevation of an appliance embodying my invention, with certain parts in vertical section.

Figure 2 is an enlarged view on line 2—2 of Fig. 1.

Figure 3 is an enlarged view on line 3—3 of Figure 1.

Figure 4 is an enlarged view on line 4—4 of Figure 1.

This invention has been in popular, defense production use for several months.

A base member 1, to be considered as firmly secured to the table of a drill press, comprises a standard 2 having a varisized horizontal bore, mostly of one diameter as at 3, but with a somewhat smaller diameter 4 at one end. A guide bushing 5 is fitted in the smaller bore 4 and is movably occupied by a plunger 6 which carries within the bore 3 a collar 7 adapted to confine a spring 8 against the inner end of the guide bushing 6, whereby the plunger is reactingly mounted. The opposite end of the plunger 6 occupies the smaller end 9 of a bore in the drill-jig bushing 10 constituting one of the primary features of my invention, and removably seated in the bore 3. The outer end of the bushing 10 is enlarged as an annular flange 11 and its coaxial bore 12 is enlarged for the reception of the shank of a stove bolt, cap screw or the like 13. The outermost end of the bore enlargement 12 may be filleted, or slightly countersunk as shown. Overhanging from the flange 11 is a segmental flange 14 which is provided just beyond the face of the flange 11 with a vertical drill-guiding hole 15. The latter is intended to guide the drill shown in broken lines in Figure 1, preparatory to drilling one or more holes radially through the channeled head 16 of the screw or bolt 13. Such holes are to receive locking wire, intertwined or sealed to insure against loosening of the attaching members. The sturdy, integral, hardened steel bushing 10 of my design is very firm, readily replaced with another, longer or shorter, with a different sized bore or with a different sized drill-guiding hole. Set screws 17 and 18 serve the usual function of fixing the guide bushing 5 and drill-bushing 10 respectively in desired positions. As will be readily understood, the plunger 6 may be employed to dislodge the drilled article.

Cooperating to hold the workpiece not only in its inserted position, but against any turning displacement during the operation of drilling a hole through the head thereof, is the mechanism next described. Another plunger 19, as exemplified with a bevelled extremity 20 adapted to enter the slot in the head of the workpiece, is reciprocable in a coaxial bore 21 of another standard 22. The plunger 19 is fashioned with a spline groove 23 adapted to be intersected by the inner end of a set screw 24 whereby to permit reciprocation of the plunger 19, but not a turning displacement of it. The plunger carries a collar 25 movable in an enlargement 26 of one end of the bore 21 and said collar confines a spring 27 against the margin of an axially alined bore in a suitably spaced standard 28. Beyond the latter the plunger 19 has affixed to it a collar 29 carrying a handle 30 which is to be used when more than one radially extending hole is to be supplied to an article and after the set screw 24 has been retracted from the bore 21. Then the handle 30 may be swung in opposite directions through predetermined arcs of movement from the vertical position against one or the other of two stops 31, preparatory to being manually held successively against one and then the other during the drilling of two holes through any particular workpiece, as is sometimes specified. It will be realized that the two plungers 6

and 19 acting in opposition to each other contrive to hold each workpiece in the bushing 10 as required for reliability of precision.

The collar 29 carries a hook 32 linked with a ring 33 which is linked in another ring 34 and the latter similarly articulates loosely with an eye 35 on a lever 36 having its lower end pivoted at 37. Thus a limited swivel connection is provided permitting selectable turning of the plunger 19 if and when desired, whereas a pull exerted on the upper end of the lever 36, against the action of the spring 27 accomplishes the withdrawal of the tip 20 preparatory to dislodgement of the workpiece by a snap release of the plunger 6 under the urge of the spring 8 against the collar 7.

I claim:

1. A jig appliance comprising the combination with a fixture provided with a variously sized bore, a plunger reactingly mounted in said bore and a bushing removably inserted in said bore and adapted to confine a workpiece, said bushing being provided with an overhanging, perforated flange and means for holding said workpiece in said bushing, said plunger being adapted to enter said bushing to discharge said workpiece when said holding means is withdrawn.

2. A jig appliance comprising the combination of a fixture provided with a bore, a drill-guiding bushing inserted in said bore, said bushing being provided with an axially extending, perforated flange, means for holding a workpiece in one end of said bushing and means entering the opposite end of said bushing for dislodging the workpiece from said bushing.

3. A jig appliance comprising the combination with a support provided with a substantially horizontal bore, a plunger reactingly mounted in said bore, a drill-guiding bushing removably inserted in said bore, said bushing being provided with an upper, segmental flange having a substantially vertical bore and another axially alined plunger cooperating with said first mentioned plunger to hold a workpiece in said bushing.

4. A drill-guiding jig appliance comprising the combination with a support provided with an open-ended hole, a plunger mounted in said hole, a drill-guiding bushing occupying one end of said hole, said bushing being provided with a flange in turn provided with a bore, and another plunger axially alined relative to and cooperating with said first mentioned plunger to hold a work-piece in said bushing with a section of the workpiece adjacent to said flange, and means for actuating said last mentioned plunger.

5. A drill-guiding appliance comprising the combination with a support provided with a hole, of a plunger mounted in said hole, a bushing occupying one end of said hole, means for fixing said bushing therein, said bushing having the outer end of its bore enlarged and being provided on one side with a radially perforated flange, another plunger adapted to hold a workpiece in said bushing, means for controlling the position of the first mentioned plunger and means for controlling the position of said second mentioned plunger.

6. A drill-guiding bushing having an opening therethrough and comprising a smaller end intended for mounting in a hollow support, the outer end of the opening in said bushing being enlarged, the differently sized portions of said opening being adapted to receive the shank and the head of a screw, the outer end of said bushing being enlarged and carrying an axially projecting segmental flange provided with a radially directed drill-receiving hole which is crossed by the head of a screw occupying the enlargement of the axial opening in said bushing.

7. A jig-appliance comprising the combination of a pair of spaced-apart standards each provided with a bore, said bores being axially alined, a drill-guiding bushing inserted in one of said bores, said bushing being provided with a flange having a radially extending bore and separate, reciprocally-operative mechanisms each including a part movable in one of said bores in a standard, said mechanism parts being respectively adapted to engage a different one of the ends of an article occupying said bushing.

8. A drill-guiding jig appliance comprising the combination of a support having a standard provided with a bore open at both ends, a plunger mounted in said bore, a drill-guiding bushing occupying one end of said bore, said bushing being provided with a radially perforated flange projecting in an axial direction from the outer end of said bushing, another standard on said support, an axially alined plunger movable in said last mentioned standard and provided with a spline groove and adapted to hold a workpiece in said bushing, a set screw in said last mentioned standard and adapted to enter said spline groove, means for actuating said last mentioned plunger axially and means for turning said last mentioned plunger when said set screw is retracted from said spline groove.

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