

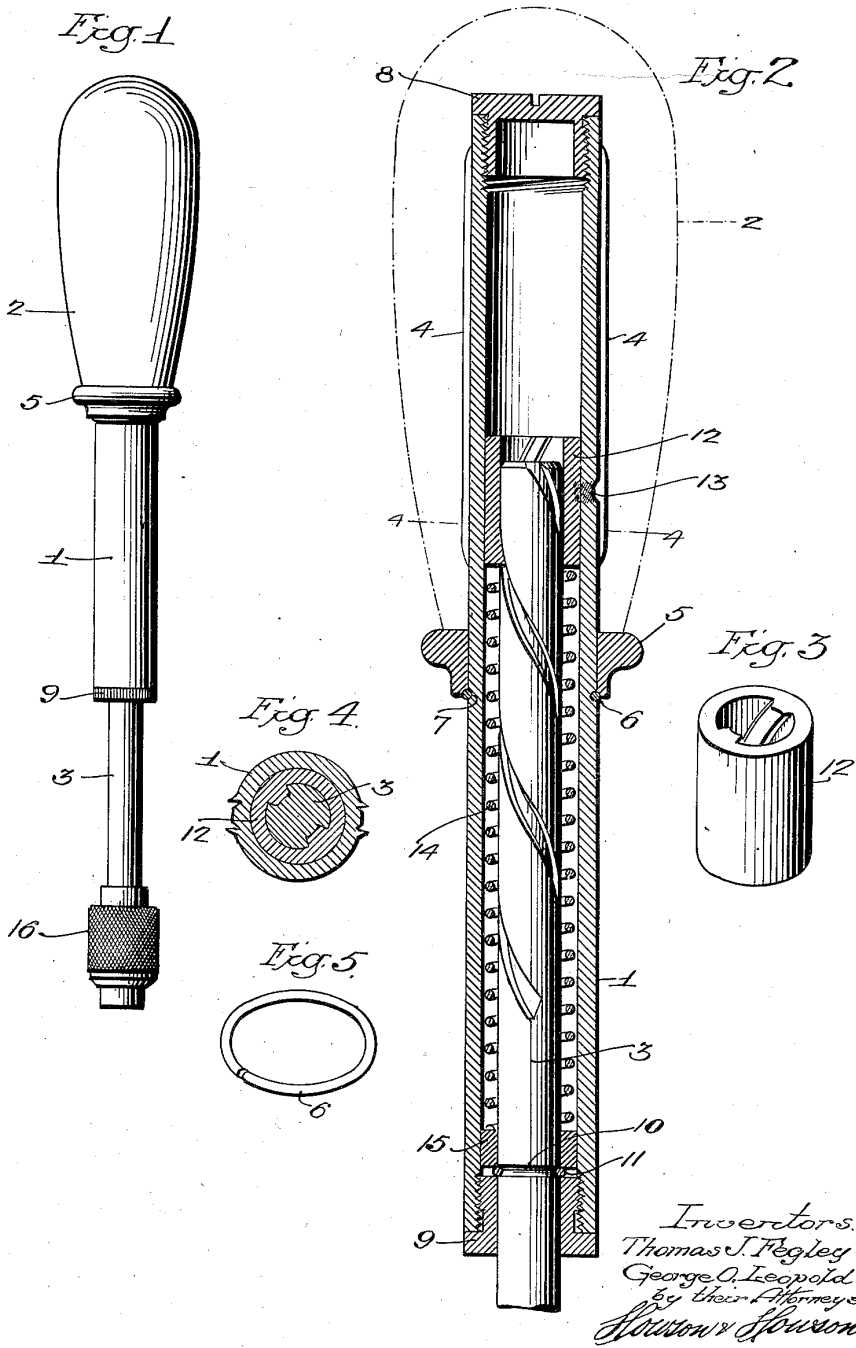
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PUSH DRILL

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PUSH DRILL

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2 Claims. (Cl. 145—53)

This invention relates to improvements in push drills and like tools, and has for a principal object the provision of a novel and simplified mode of construction making possible the production of a durable and efficient tool of this type at a relatively low manufacturing expense.

More specifically, an object of the invention is to reduce the number of the component parts of the tool to a practical minimum and to simplify the forms of said parts and the mode of assembly thereof in the tool structure.

In the attached drawing:

Figure 1 is a view showing the external appearance of a tool made in accordance with our invention;

Fig. 2 is a fragmentary longitudinal sectional view illustrating the operating parts of the tool and the manner in which they are assembled;

Fig. 3 is a detached view in perspective of one of the elements of the mechanism;

Fig. 4 is a section on the line 4—4, Fig. 2, and Fig. 5 is a detached view in perspective of another of the individual parts of the device.

With reference to the drawing, the tool as therein illustrated may comprise a tubular body member 1, to one end of which is attached a handle 2. Partially housed within the body member 1 is a threaded stem 3, this stem in operation being adapted to reciprocate longitudinally and to simultaneously rotate about its axis within and with respect to the body member. The end of the member 1 which receives the handle 2 is, preferably, scored on the outer surface so as to throw out longitudinal ribs 4, see Fig. 2, these ribs in assembly penetrating the interior surface of the handle 2 and thereby positively immobilizing the handle against rotary movement with respect to the body member. To this end, the handle may suitably be made of wood or other material capable of being penetrated by the said ribs. At the inner end of the handle is a metal ring or ferrule 5 which in assembly engages a split ring 6 of spring wire seated in an annular groove 7 in the body member, said ring constituting a limiting stop for the handle on the body member. A ring of this character is shown in perspective in Fig. 5. The metal ring or ferrule 5 forms a solid abutment for the handle 2. It will be noted that the end of the member 1 which receives the handle 2 is interiorly threaded for reception of a screw plug 8, the function of which will be hereinafter described.

The opposite end of the body member 1 is similarly interiorly threaded for reception of a sleeve 9 which embraces the unthreaded or outer portion

of the stem 3. This stem, as shown in Fig. 2, is provided with an annular groove 10 which is adapted for reception of a split ring 11 similar to the ring 6 previously described, and this spring 11 by engagement with the inner end of the sleeve 9 limits the extent to which the stem 3 may project from the body member 1, and in effect locks the stem in the body member.

Suitably secured within the body member 1 is a threaded sleeve or cylindrical nut 12, this nut being shown in perspective in Fig. 3, and this nut closely embraces the inner end of the stem 3 and meshes with the latter so that any longitudinal or axial movement of the stem in the body member must necessarily be accompanied by a rotary movement of said stem about its axis. The nut 12 in the present instance is secured in the body member by a spotweld indicated at 13. Below the nut and embracing the stem 3 is a coiled spring 14, one end of this spring engaging an end of the nut 12 and the other end seating upon a sleeve 15 which loosely embraces the stem and bears against the locking ring 11, as shown in Fig. 2. The spring 14 thus tends to hold the stem 3 in the extended position as illustrated, but permits the stem to move axially inwardly of the body member 1. When the stem is thus moved inwardly, as previously set forth, it is caused by its interengagement with the nut 12 to rotate about its axis. The outer end of the stem 3, as shown in Fig. 1, is provided with a chuck 16, which may be of conventional form, for holding the drill or other bit.

The operation of the tool described above will be readily understood by those familiar with the art. With the bit in contact with the work pressure is applied longitudinally of the tool tending to force the stem 3 inwardly of the body member 1. This inward movement of the stem with its accompanying rotary movement may continue until the inner end of the stem engages the screw plug 8 at the inner end of the body member. The novelty of the device resides primarily in its simplicity of form and assembly and cheapness of manufacture. In assembling the tool, the nut 12 is first inserted into the body member 1 and secured therein by means, for example, of the spotweld 13. Thereafter the split ring 6 is applied to the body member, the plug 8 threaded into the latter, the ferrule 5 slipped onto the body member and against the ring 6, and the handle 2 thereafter forced into place. The split ring 11 is then placed in the annular groove 10 of the stem, the sleeve 15 and the spring 14 placed on the inner or threaded end of the stem

with the sleeve 15 in engagement with the ring 11, and the stem is then inserted into the body member so that its inner end meshes with the nut 12. The sleeve 9 embracing the stem is then
 5 threaded into the body member, thereby releasably locking the stem assembly in the body. The chuck 16 may be applied to the stem after or prior to assembly of the stem with the body member, but in the event that the chuck is applied to the
 10 stem before the latter is assembled with the body member, the sleeve 9 must be placed on the stem below the groove 10 before the split ring 11 is seated in the groove 10. The stem assembly may readily be withdrawn from the body member for
 15 inspection, repair or lubrication by releasing the threaded sleeve 9.

We claim:

1. In a tool of the character described, the combination with a tubular body member, of a nut
 20 element secured in said body member intermediate the ends thereof, a threaded stem inserted in and projecting from one end of said body member and being threaded for cooperative
 25 engagement with the said nut, a sleeve embracing said stem and detachably secured at the end of said body member, an annular groove in said stem and a resilient split ring seating in said
 30 groove and adapted by engagement with the inner end of said threaded sleeve to retain the stem in assembly with the body member, a sleeve
 35 loosely embracing the stem and seating against the inner side of said ring, and a spring confined between the last-named sleeve and said nut and normally retaining the stem in an extended position with respect to the body wherein

the said split ring abuts the first-named sleeve.

2. In a tool of the character described, the combination with a tubular body member, of a handle
 5 element secured to and embracing one end of said body member, a ferrule embracing the body member and forming an abutment for the inner
 10 end of the handle element, a resilient split ring seated in an annular groove in said body member and forming an abutment for said ferrule, a plug detachably secured in the handle end of said
 15 body member and embraced by said handle element, a nut element secured in the interior of said body member intermediate the ends of the latter, a stem inserted in the opposite end of
 20 said body member and projecting from the latter, said stem being threaded for cooperative engagement with the nut, a sleeve embracing the said stem and detachably secured in the end
 25 of said body member, a resilient split ring seated in an annular groove in said stem and by engagement with the inner end of said sleeve retaining the stem in the body member, a sleeve loosely embracing the stem and seating against the inner
 30 side of said split ring, and a spring embracing the threaded portion of said stem and confined between the said nut and the last-named sleeve, said spring normally retaining the stem in a relatively extended position with respect to the
 35 body member and permitting longitudinal movement of the stem inwardly of said body member to an extent corresponding to the distance between the inner end of the stem when in the extended position and the said plug.

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