Sept. 4, 1928. 1,683,044

F. D. MONGEAU

BURNISHING TOOL

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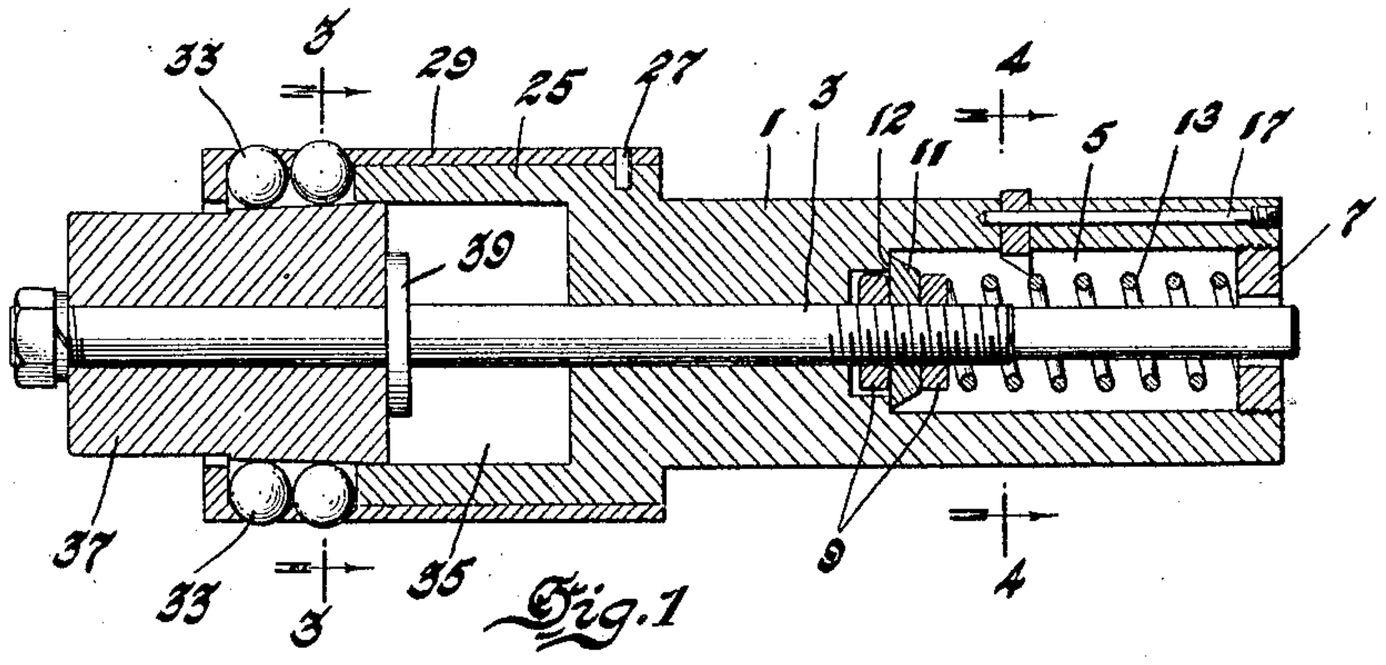

Fig. 1

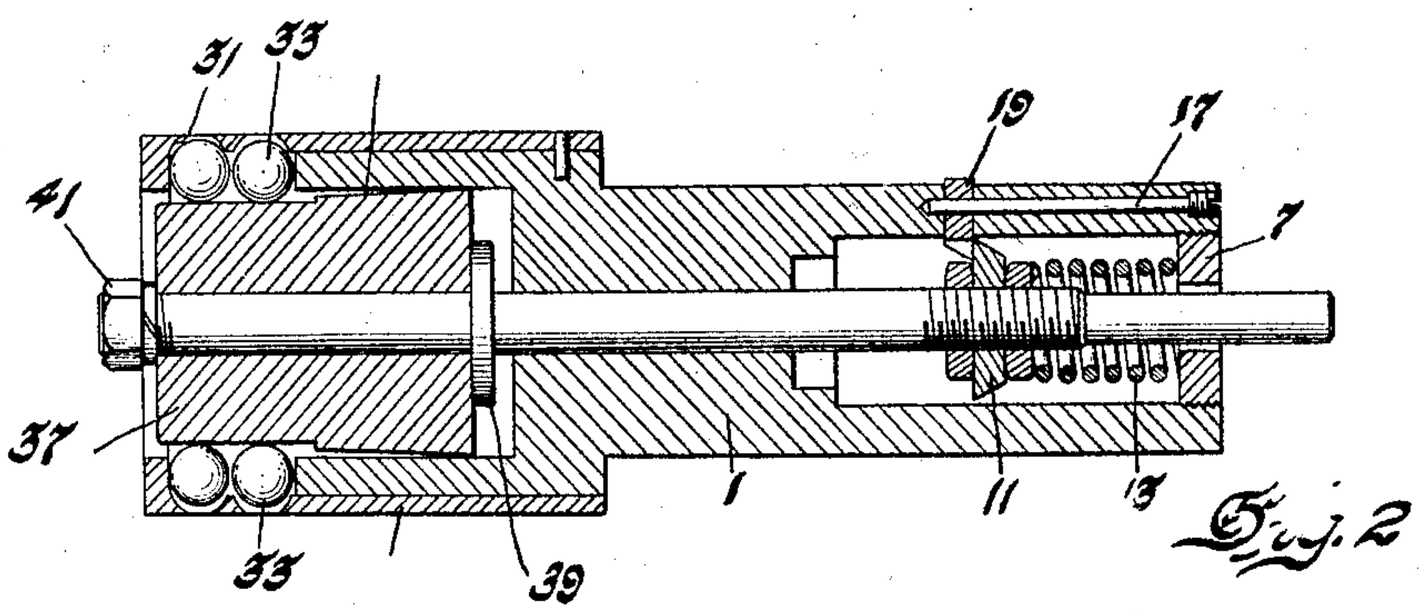

Fig. 2

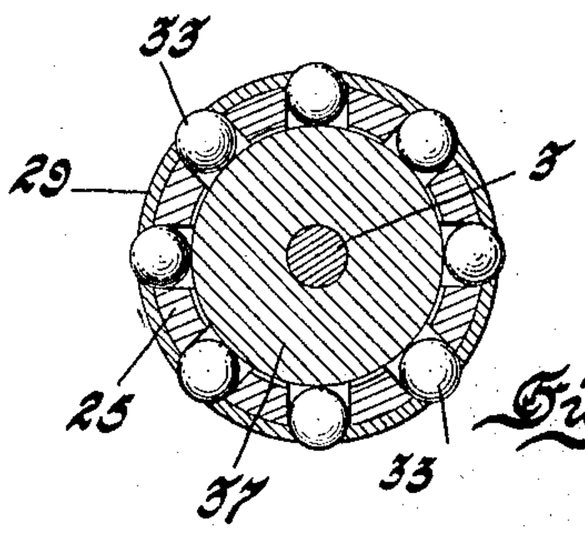

Fig. 3

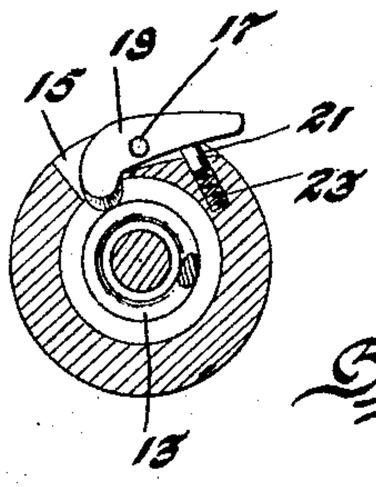

Fig. 4

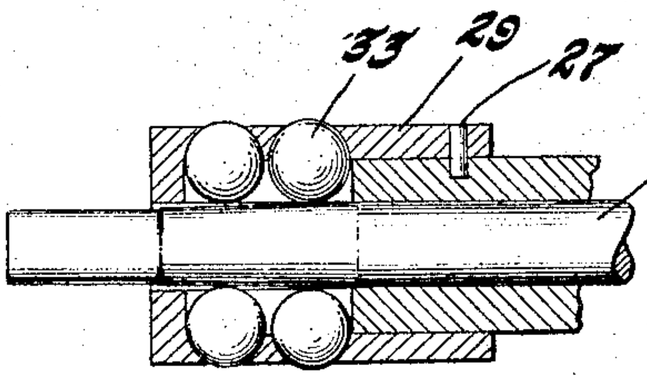

Fig. 5

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UNITED STATES PATENT OFFICE.

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BURNISHING TOOL.

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This invention relates to the art of burnishing. An improved burnishing tool has been devised which constitutes the subject matter of this invention.

The tool may be used for burnishing such articles as valve lifter guides. If built on a larger scale it may be used to burnish engine cylinders or other large cylindrical walls.

It is an object of the invention to construct a burnishing tool for the purpose stated which shall be practically imperishable.

A further object is to provide for a convenient adjustment of the tool.

Another object is to provide means to burnish the hole by rotated balls.

A further provision of the tool is to arrange for automatically releasing the burnishing balls from operative position at the end of their travel.

A still further object is to employ means within the tool to hold the burnishing members retracted while the tool is being removed from the work.

The following description and the accompanying drawing are intended to convey a full understanding of the invention.

In the drawing:

Figure 1 is a longitudinal section of the tool.

Figure 2 is a similar view showing the parts in a different position.

Figure 3 is a transverse section on line 3—3 of Figure 1.

Figure 4 is a transverse section on line 4—4 of Figure 1.

Figure 5 is a longitudinal section of a modification.

Referring by reference characters to the drawing, numeral 1 represents a hollow cylindrical body constituting the tool proper. Through this body 1 is inserted a rod 3. At one end the tool has an enlarged opening 5 closed by a plug 7, through which the rod 3 passes. Nuts 9—9 are adjustably threaded on this rod and between the nuts is a washer 11 of conical shape. Between the nuts and the washer on the one hand and the plug 7 on the other, is a coil spring 13. This coil spring normally holds the rod 3 inwardly as in Figure 1 with the washer 11 engaging a shoulder 12 of the tool member 1.

Means is provided to hold the rod in retracted position with spring 13 under compression. To that end the wall of part 1 is cut away at 15, as shown in Figure 4. A pin 17 extends longitudinally of the tool and crosses the cut-away portion 15, and upon the said pin 17 is pivoted a latch 19, having a tapered inner end. The latch is positioned to engage the washer 11 as the rod 3 moves to the right. The tapered ends of parts 11 and 19 engage each other and as part 11 passes the latch 19 the latch is swung down by a spring actuated plunger 21 mounted in a suitable recess 23 in the tool member. It will be seen from examination of Figure 2 that the flat faces of 19 and 11 are then in engagement and the rod 3 is held in retracted position with spring 13 under compression.

At the working end, the tool is enlarged as at 25 and to the enlarged end is secured, by fastening means 27, a sleeve 29 which extends beyond the end of the tool where it is provided with apertures 31 for the reception of balls 33. These apertures are arranged in a circumferential series as shown in Figure 3. The diameter of the apertures is less than that of the balls so that escape of the balls through the opening is prevented. The tool at the work end has a large opening 35 and within this opening the rod 3 is provided with a bushing 37 which has an end portion of its surface tapered as at 39 for the purposes of adjustment of the balls to a variable extent through the apertures of sleeve 29. A shoulder 39 and a nut 41 hold the bushing in position on rod 3. It is intended that the bushing shall rotate upon rod 5 in the operation of the tool end, obviously, anti-friction means could be made use of between the bushing and the rod, if desired.

It will be understood that in the operation of the device the latch may be manually depressed, (see Figure 4) to permit the spring to thrust the rod 3 and the bushing 37 to the position shown by Figure 1. In this position the washer 11 engages the shoulder of the tool member 1. By suitably adjusting the nuts 9 and washer 11 the degree of projection of the burnishing balls may be determined. The tool is then rotated by a lathe or other machine within a cylinder the interior wall of which is to be burnished. At the end of its travel the bushing is pushed back by engagement with any suitable stop against the compression of spring 13, thereby allowing the burnishing balls to recede. By means of the cooperating parts, including the washer 11 and the latch 19, the parts are held retracted while the tool is being withdrawn from the work. The construction just described is intended more particularly for

burnishing walls of cylinders or large openings.

In Figure 5 is illustrated the simpler form for working on smaller parts. In this form the bushing is omitted and the tapered surface is formed on the rod 3. In this case the rod under the pressure of the balls rotates, differing in this respect from the form described above where the bushing rotates around the rod. In other respects this form is substantially like that before described.

I claim:

1. A burnishing tool comprising a tool member having radial openings, burnishing members variably projectable in said openings, means movably within said tool to project said burnishing means, yieldable means to hold said movable means in operative position, and means to engage and hold the said movable means in retracted position.

2. A burnishing tool comprising a tool member having radial openings, burnishing members variably projectable in said openings, axially movable means within said tool, means biasing said movable means to hold said burnishing members in outward position, means to adjust said biasing position on said movable means to predetermine the projected position of said burnishing members, said last named means being a member adjustable on said movable means and engageable with a part of said tool under the influence of said biasing means.

3. A burnishing tool comprising a cylindrical tool member having radial apertures, burnishing members in said apertures, movable means to variably move said burnishing members radially in said apertures, means to lock said movable means in retracted position, said last named means including a latch automatically engaging said movable means.

4. A burnishing tool comprising a tool member having radial apertures, burnishing members in said apertures, movable means within the said tool having a part to variably project said burnishing means radially in said apertures, a member adjustable on said movable means, resilient means to bias said movable means to operative position by moving the adjustable means against a fixed abutment.

5. The combination set forth in claim 4 together with a latch to automatically lock said movable means in retracted position by engagement with said adjustable means.

6. A burnishing tool comprising a tool member having radial openings, burnishing members radially movable in said openings, a member movable longitudinally through said tool, means on said movable member to project said burnishing member radially to an extent depending upon the position of said movable member, adjusting means on said movable member engageable with a part of said tool, resilient means to movably hold said adjustable means in engagement with said tool and the burnishing members projected, and a manually releasable latch automatically engageable with said adjustable means when the movable means is retracted against the compression of the resilient means.

7. A burnishing tool comprising a tool member, burnishing means radially movable relative thereto, resilient means to hold said burnishing means in projected position, means to pre-determine the extent of such radial projection, and means to lock said resilient means under compression to permit the withdrawal of said burnishing means.

8. A burnishing tool comprising a tool member, burnishing means radially movable therein, reciprocating means in said tool member, a tapered bushing rotatable on said reciprocating means and engaging said burnishing means to variably project the same, together with resilient means to normally project said burnishing means and automatically operative means to lock said reciprocating means in retracted position.

9. A burnishing tool comprising a tool member, burnishing means radially movable therein, reciprocating means in said tool, a tapered bushing on said reciprocating means engaging said burnishing means to variably project the same, and resilient means to project said burnishing means and means adjustably carried by said reciprocating means and engaging an abutment on said tool member to predetermine the radial projection of said burnishing means.

10. A burnishing tool comprising a tool member, burnishing means radially movable therein, reciprocating means in said tool, a tapered bushing on said reciprocating means engaging said burnishing means to variably project the same, resilient means to reciprocate said burnishing means, and means comprising automatically engaging parts on said tool member and said reciprocating member to lock said reciprocating member in retracted position, one of said interengaging parts being longitudinally adjustable.

11. A burnishing tool comprising a tool member, burnishing means radially movable therein, reciprocating means in said tool, a tapered bushing on said reciprocating means and engaging said burnishing means to variably retract the same, resilient means to normally project said burnishing means and automatically operative mechanism to lock said reciprocating means in retracted position, said mechanism comprising a stop longitudinally adjustable on said reciprocating means and a pivotal latch on said tool member.

In testimony whereof I affix my signature.

FRED D. MONGEAU.