July 14, 1931. R. W. ANDREASSON 1,814,655

TOOL HOLDER

Filed May 28, 1930

Fig. 1.

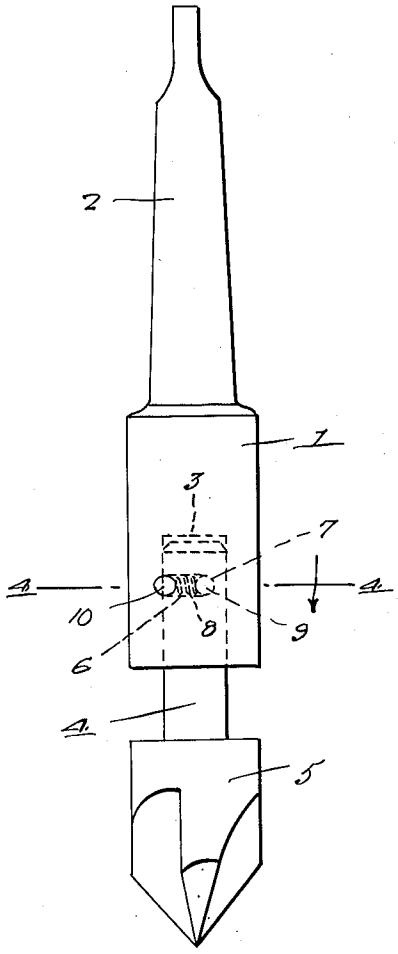



Fig. 2.

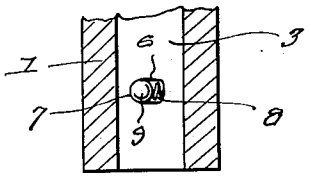



Fig. 3.

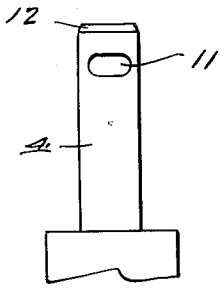
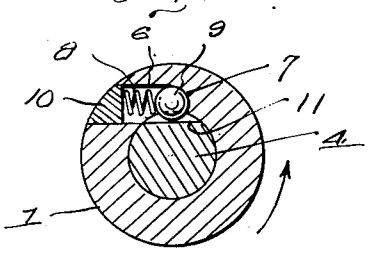



Fig. 4.




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Patented July 14, 1931 1,814,655

# UNITED STATES PATENT OFFICE

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## TOOL HOLDER

Application filed May 28, 1930. Serial No. 456,620.

This invention has reference to tool holders and more particularly to an improved holder for special tools such as drills, reamers, counterbores, etc., having straight shanks.

An object of the invention is to provide an improved holder having means for removably securing the tool directly therein in an assembled and efficient manner and without the necessity of employing auxiliary sleeves or special collars for the tool.

A further object is to provide a holder of this character which is adapted for use in any and all kinds of drilling and boring machines, and which can be manufactured and assembled at small cost.

With the above and numerous other objects in view, the invention consists in the novel construction, arrangement and combination of parts hereinafter more fully described with reference to the accompanying drawings, wherein:

Figure 1 is a side elevation of a tool holder embodying the invention,

Figure 2 is a fragmentary sectional view of the socket portion of the holder,

Figure 3 is a fragmentary elevational view of the shank portion of the tool, and

Figure 4 is a cross sectional view of the holder, taken on line 4—4 of Figure 1, and looking in the direction indicated by the arrows.

The improved holder comprises a socket portion 1 having an integral tapering shank 2 for insertion in a driving spindle of a boring or drilling machine. The socket portion 1 has a bore or socket 3 for engaging the shank 4 of a tool bit 5. The tool shank 4 and the holder socket 1 are provided with cooperative means for establishing a supporting and a driving connection between the socket and the tool, and the particular means employed constituting an important feature of the invention herein described.

As illustrated, the socket 1 has a horizontal passageway 6 extending transversely through the wall of the socket 2 about midway the inner and outer end thereof and tangentially intersecting the socket bore with its inner end terminating in a seat 7 open to and substantially opposite the center of the bore, as shown in Figure 4, and its outer end opened through the outer face of the socket wall. Enclosed within the passageway is a tension spring 8, one end of which presses against a ball 9 for normally holding it upon the seat 7 while the other end of the spring rests against a plug 10 closing the outer end of the passageway.

Adapted to cooperate with the spring pressed ball, is a tangential notch 11 having a flat bottom, which notch is formed on one side of the tool shank 4 and below the outer end of the shank which is chamfered as shown at 12 in Figure 3. When the parts are engaged, as shown in Figure 1, the ball 9 extends into the notch 11 and locks the socket 1 in driving relation with the tool shank 4.

In connecting the tool to the holder, the shank 4 is inserted in the socket bore 3 until the chamfered end engages the ball 9 and the shank is given a slight pressure to the left and at the same time a slight forward motion so as to unseat the ball and force it back into the passageway and out of the path of the tool shank, compressing the spring 8. The tool shank is then rotated either to the right or left until the notch 11 registers with the inner open end of the passageway 6 and the ball has been forced into engagement therewith through the action of the tensioning spring.

The ball thus connects the shank of the tool to the socket and prevents it from dropping out of the latter. Moreover, when the tool is in operation, the rotation of the socket in the cutting direction causes the ball to become lodged in the forwardly disposed end of the notch so as to exert a driving thrust against the shank of the tool for rotating it in the operative direction. To disconnect the parts, it is necessary only to give a slight turn of the tool shank to the left of Figure 4, causing the rear end of the flat bottom of the notch to press against the rear edge of the projecting part of the ball, so as to unseat it and force it into the passageway 6 against the action of the tension spring until it is entirely clear of the notch at which time the

tool shank is free to be disengaged from the socket.

From the foregoing it will be seen that my invention not only provides a connecting means between the socket end shank portion of the tool but also a driving connection which is operable to rigidly connect the parts upon rotation of the tool in one direction and yieldable to release the parts when the tool shank is turned in a reverse direction.

Having thus described my invention, what is claimed as new is:

A tool holder comprising a socket member having a bore and a transverse passage tangentially intersecting the bore with its inner end terminating in a ball seat open to and substantially opposite the center of the bore, a spring pressed ball in said passageway normally seated in said ball seat and partly extending into the said bore and retractible in the passageway, a tool having a shank inserted in the said socket, said shank being provided with a tangential flat bottom notch formed on one side thereof to receive the part of the ball which extends into the said bore, said notch having one end thereof engageable with the said ball for unseating and moving the same in the passageway upon movement of the tool shank in one direction and having its opposite end engageable with the ball for confining the same to its seat upon movement of the tool shank in the reverse direction.

In testimony whereof I affix my signature.

RUDOLF WILLIAM ANDREASSON.