Aug. 24, 1943. J. A. HOWARD 2,327,897

FLOATING TOOL HOLDER

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Fig. 1.

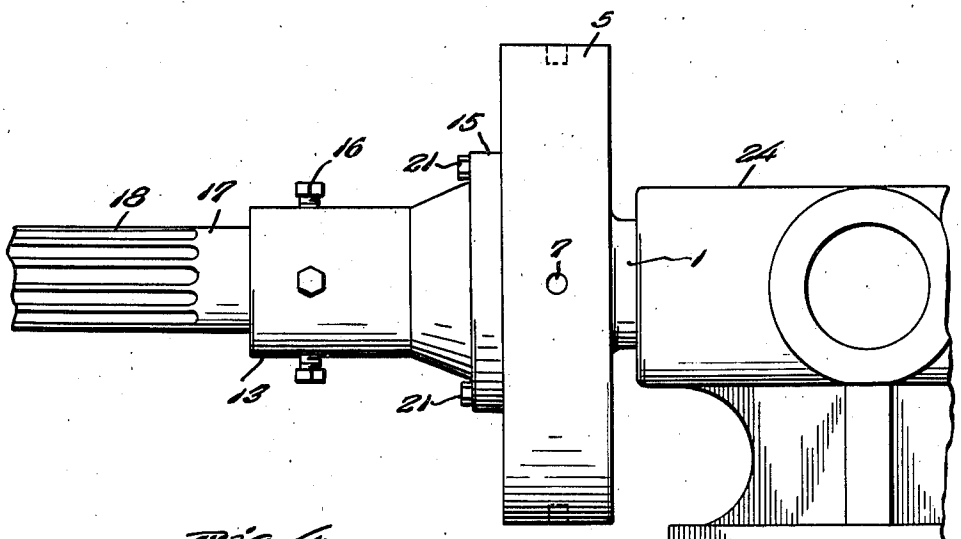


Fig. 4.

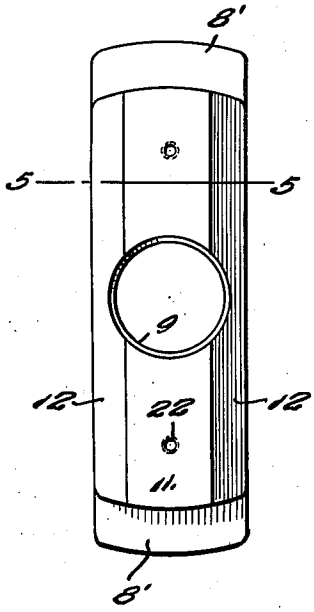


Fig. 5.

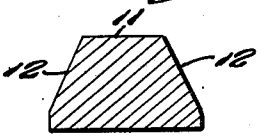
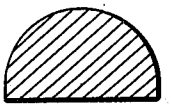


Fig. 6.



Inventor

Joseph A. Howard

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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Fig. 2.

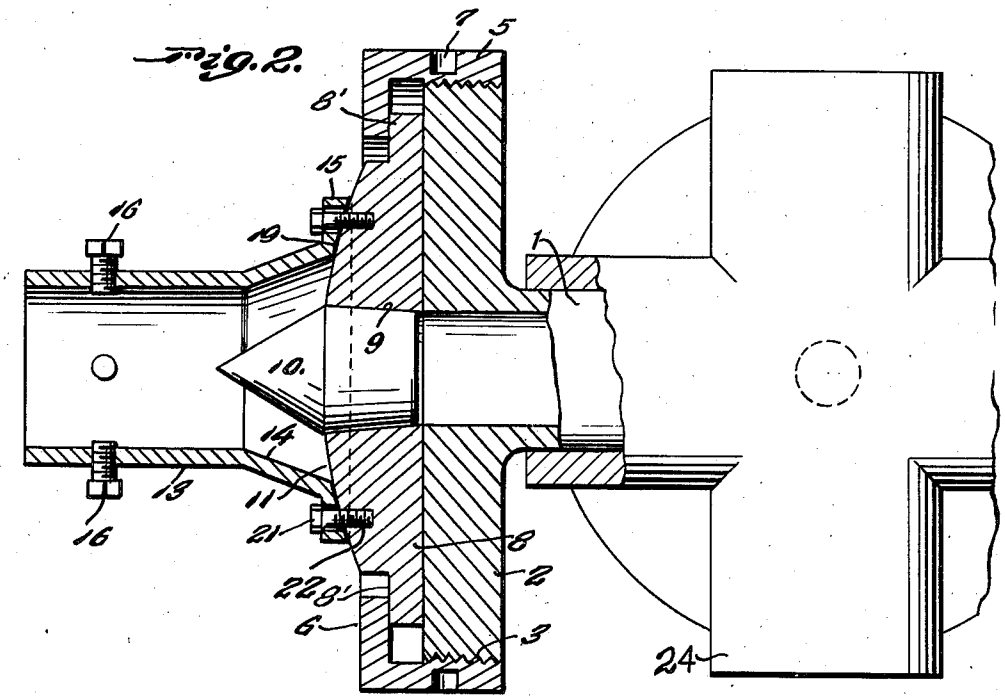
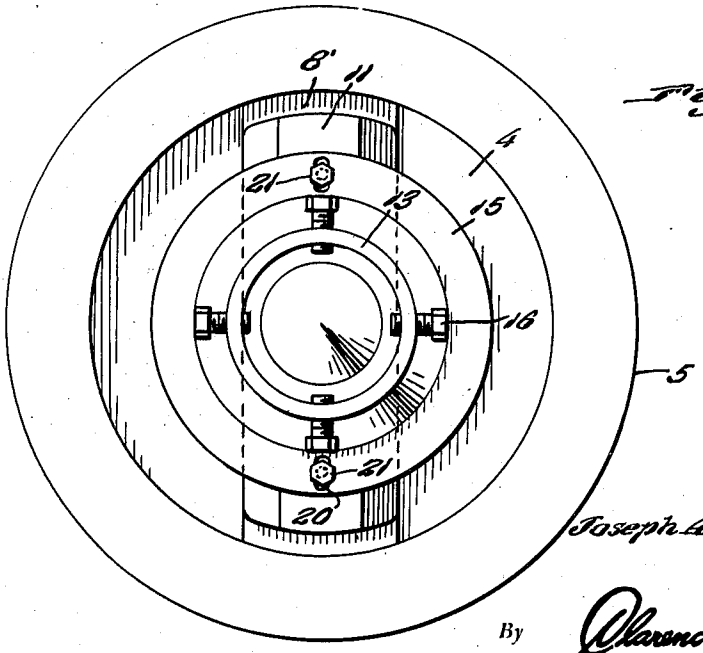


Fig. 3.



Inventor

Joseph A. Howard

By Clarence O'Brien and Harvey B. Jackson

Attorneys

Patented Aug. 24, 1943

2,327,897

UNITED STATES PATENT OFFICE

2,327,897

FLOATING TOOLHOLDER

Joseph A. Howard, Roscoe, Calif.

Application March 18, 1942, Serial No. 435,225

2 Claims. (Cl. 279—16)

My invention relates to improvements in tool holders for use especially, although not necessarily, on turret lathes.

The invention is designed with the particular object in view of providing a simply constructed, efficient, floating tool holder for reamers adapted for maintaining the reamer accurately centered in the hole being reamed and which may be used with other tools such as drills and taps and in other types of lathes.

Other and subordinate objects are also comprehended by my invention, all of which, together with the precise nature of my improvements, will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in side elevation of the preferred embodiment of my invention.

Figure 2 is a view in longitudinal section drawn to an enlarged scale.

Figure 3 is a view in front elevation.

Figure 4 is a view in front elevation of the bar detached.

Figure 5 is a view in transverse section taken on the line 5—5 of Figure 4, and

Figure 6 is a similar view of a modification of the invention.

Referring to the drawings by numerals, my improved tool holder in its preferred embodiment comprises a preferably tubular shank 1 of the proper size to fit in the usual turret of a lathe, or in a tailstock, and which is provided with a disk-like, concentric head 2 externally threaded, as at 3, the head having a flat front face 4 perpendicular to the axis of the shank 1.

An internally threaded clamping ring 5 is turned onto the head 2 and is provided in front of the head 2 with an internal, annular, front edge flange 6 disposed at a right angle to the body of the ring for clamping coaction with the front face 4 of said head for a purpose presently seen. Sockets 7 are provided in the ring for use in turning the same on and off the head 2 with a tool such as a spanner wrench.

Clamped between the flange 6 and the front face 4 of the head 2 is a bar 8 designed to extend diametrically of the head and to fit flat against said face 4, said bar having reduced ends 8' fitting behind the flange 6 whereby said bar may be clamped between the face 4 of the head 2 and said flange by turning the ring 5 onto the head. The bar 8 is shorter than the diameter of the head 2 to provide for endwise shifting of the same relative to the head for a purpose presently clear. The bar 8 is provided with a central inwardly tapering bore 9 in which is frictionally fitted a center 10 tapered forwardly at any desired angle to a point and extending forwardly of said bar. A particular feature of my invention is that the bar 8 is formed with a longitudinally convex front face 11 preferably, as shown in Figures 3, 4 and 5, provided with beveled side edges 12. The front face 11 of the bar 8 is precision formed in an arc, if the holder be mounted in a turret lathe, of the same radius as the arc in which the turret of the lathe swings. The bar 8 carries a collet 13 extending forwardly therefrom axially thereof and into which the center 10 extends part way.

The collet 13 is of tubular form with a flared rear end 14 and an external lateral edge flange 15 surrounding said end. Radially disposed set screws 16 in said collet, forwardly of said end 14, provide for clamping the shank 17 of a reamer, 18 in the collet, it being understood that the shank of the reamer is designed to fit in the collet. The rear end of the collet 13 is formed with a concave diametrical groove therein, as at 19, said groove being formed longitudinally and transversely to conform to the shape of the front face 11 of the bar 8. The flange 15 of the collet 13 has formed therein a pair of diametrically opposite slots 20 elongated radially of the flange and for accommodating a pair of lag screws 21 turned into threaded bores 22 provided in the face 11 of the bar 8. The screws 21 are smaller in diameter than the width of the slots 20 so that with said screws loosened, the collet may float on the bar 8. In the modification of the invention shown in Figure 6, the front face 23 of the bar is formed transversely in the arc of a circle. The collet when used with this form of bar, as will be understood, will be correspondingly modified as regards the diametrical groove therein.

In setting the described holder in a turret lathe, the shank 1 is pushed into a socket of the turret 24 of the lathe, not shown, with the bar 8 disposed horizontally. The shank 1 should be secured in the turret 24 in a position such that the longitudinal curve of the front face 11 of the bar 8 will swing concentrically about the axis of the turret when the latter swings around. After the shank 1 is thus positioned in the turret 24, the collet 13 is detached, the ring 5 loosened to free the bar 8, and the turret moves forwardly to enter the center 10 in the hole to be reamed. With slight pressure on the turret, the center 10 will locate itself and hence the bar 8 on center

relative to the hole. The ring 5 is then tightened to maintain the center 10 and bar 8 in the centered position, after which the collet 13 may be attached to the bar 8, with the screws loosened, and the shank of the reamer 18 may be secured in the collet 13 slightly forward of the center 10 to permit the collet 13 to ride or float on the bar 8. The longitudinal curvature of the face 11 of the bar 8 coacts with the groove 19 in the collet to cam the collet and hence the reamer 18 into centered position relative to the hole. The transverse beveled edges 12 of the bar 8, or, the arcuate form of said bar, as in the modified embodiment, coacts with said groove to lift the collet and hence the tail end of the reamer into line with a minimum of pressure exerted against the reamer.

As an optional use of the described holder, in working with small reamers, after the bar 8 has been centered relative to the hole in the manner already described, the center 10 may be detached from the bar 8 and the shank of the reamer shoved back into the shank 1, through said bar 8, to float in said shank 1.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention without further explanation.

Although the invention has been described herein in specific terms, it is to be understood that the present disclosure is illustrative rather than restrictive, and that other modifications than described may be resorted to without departing from the inventive concept or the scope of the appended claims.

What I claim is:

1. In a tool holder for use in turret lathe and with a reamer, a shank for insertion in said turret and provided with a disk-like concentric head on one end thereof, having a front face perpendicular to the axis of said shank, a bar fitting flat against said face to extend across the same, and having a longitudinally arcuate front face and side edges converging toward said face, a center extending forwardly from said bar centrally thereof for insertion in a hole to be reamed to thereby axially align the bar with said hole, means to fasten said bar to said head in axially aligned position, a collet for holding a reamer with the tail end on said center, said collet interfitting with the front face and sides of said bar, and means to mount said collet on said bar to float thereon.

2. In a tool holder for use in turret lathe and with a reamer, a shank for insertion in said turret and provided with a disk-like concentric head on one end thereof having a front face perpendicular to the axis of said shank, a bar fitting flat against said face to extend across the same, and having a longitudinally arcuate front face and side edges converging toward said face, a center extending forwardly from said bar centrally thereof for insertion in a hole to be reamed to thereby axially align the bar with said hole, means to fasten said bar to said head in axially aligned position, a collet for holding a reamer with the tail end on said center, said collet interfitting with the front face and sides of said bar, and means to mount said collet on said bar to float thereon, the first-mentioned means comprising a clamping ring threaded onto said head and confining the ends of said bar between the same and said face of the head, said last-mentioned means comprising a lateral slotted flange on said collet, and screws extending through the slots of said flange into said head.

JOSEPH A. HOWARD.