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2,474,360

RETAINER

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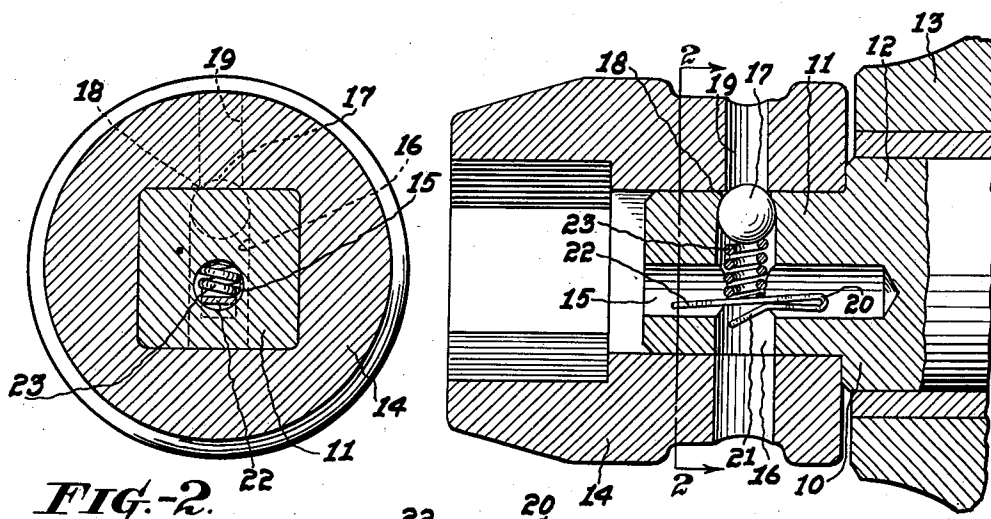


FIG-2.

FIG-1.

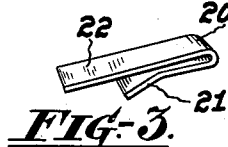


FIG-3.

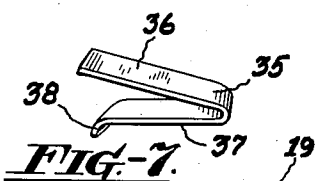


FIG-7.

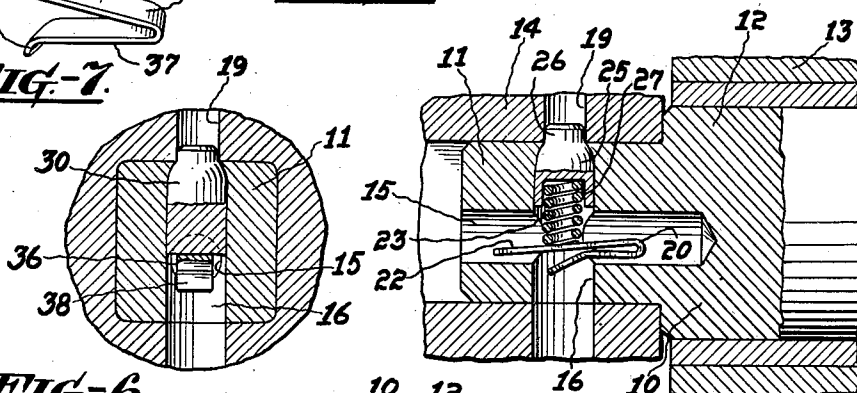


FIG-6.

FIG-4.

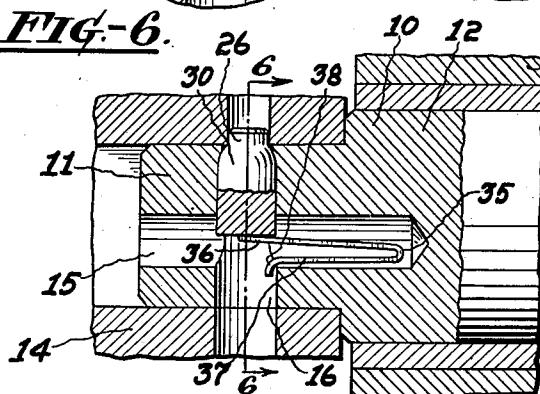


FIG-5.

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UNITED STATES PATENT OFFICE

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RETAINER

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5 Claims. (Cl. 287—119)

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This invention relates to power tool spindles and particularly to spindles provided with a means for releasably attaching thereto devices such as socket wrenches and the like.

Detents for holding socket wrenches and the like on rotating spindles as commonly used are not replaceable when worn out. It is an object of this invention to provide a spindle of this type with a detent which can be readily removed and replaced and which is of a very simple nature and easily manufactured.

Other objects and advantages of the invention will become obvious from the following description taken in conjunction with the drawings showing preferred embodiments of the invention.

In the drawing in which similar reference characters refer to similar parts,

Fig. 1 is a longitudinal section thru a spindle and socket wrench mounted thereon constructed in accordance with the practice of the invention.

Fig. 2 is a cross section thru the spindle taken along the line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a perspective view of the hairpin type spring for holding the detent in place.

Fig. 4 is a longitudinal section thru a modified form of the detent.

Fig. 5 is a longitudinal section thru a spindle showing still another modified form of detent.

Fig. 6 is a cross sectional view along the line 6—6 of Fig. 5 looking in the direction of the arrows, and

Fig. 7 is a perspective view of the hairpin type of spring shown in Figs. 5 and 6.

Referring to the drawings and more particularly to Figures 1, 2 and 3 the spindle is indicated at 10 and is provided with a polygonal end 11 in this instance square which projects beyond the bearing part 12 which may be suitably housed in the casing 13 only part of which is shown. The square end 11 of the shaft is adapted to receive the common type of socket 14 which is, of course, well known in the art. The spindle at its projecting end 11 is provided with a longitudinal hole 15 and the transverse hole 16 which intersect. The hole 15 opens into the front end of the spindle and the hole 16 opens into opposed side surfaces of the spindle so that things placed in one or the other hole may be reached by either. The hole 16 is adapted to receive a detent member, in this instance, a ball 17 which is adapted to project slightly beyond the end of the hole. It is restricted, however, in its motion by a constriction in the hole 16 at 18. As is well known in the art the ball detent 17 is adapted to co-act with an

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aperture 19 in the socket 14 in alignment with the hole 16.

For the purpose of releasably mounting the detent member 17 in position to engage the hole 19 of socket 14 this invention provides a hairpin shaped spring 20 inserted with the bent end foremost into the hole 15 to a position straddling the transverse hole 16. The spring 20 has a short leg 21 and a bent portion on its free end which is adapted to clip into the transverse hole 16 so as to be yieldingly retained in place thereby. The longer, and in this instance the upper, leg 22 of the hairpin spring is adapted to exert pressure against the detent member 17 in this instance thru the medium of a coil spring 23 interposed between the ball 17 and the leg 22.

The operation of the detent is evident from the foregoing description. The detent may be removed from the spindle very readily by inserting a screw driver or similar article thru the hole 16 to engage the shorter end 21 of the spring to disengage it from the wall of the hole 16 whereupon it may be worked forward in hole 15. The spring 23 and ball 17 will then be readily pushed from the hole 16 by a suitable rod inserted therein.

In Fig. 4 is illustrated a type of detent generally known as a pin which provides a more positive lock for the socket wrench. The pin in this instance comprises a cylindrical portion 25 slidably insertable in the hole 16 and having a straight head portion 26 fitting rather accurately the hole 19 of the socket wrench. The spring 23 is in this instance adapted to fit within a bore 27 in the main portion of the pin 25 and bears as before against the longer leg 22 of the spring 20.

In order to release the socket 14 from the spindle it is necessary to depress the pin 25 by some suitable form of rod (not shown) inserted thru the hole 19.

Figs. 5, 6 and 7 show still another modification of the invention. In this instance the pin type of detent 30 is solid and no coil spring is used. It is inserted into the hole 16 in the same manner as the pin 25. Unlike the pin 25 however it is solid and the only pressure applied to it is that of the hairpin spring 35 which in this instance is somewhat longer and more flexible than the spring 20. As before, the upper leg 36 is longer than the lower leg 37 and a sharp bend 38 at the end of the latter leg is adapted to project into the hole 16 and cooperate therewith to prevent displacement of the spring.

Thus by the above construction are accom-

plished the objects and advantages hereinbefore referred to.

I claim:

1. A wrench spindle and the like comprising a shank having a tool engaging section and provided with intersecting transverse and longitudinal holes, the transverse hole having a constriction adjacent one end, a detent member loose in the transverse hole protruding therefrom and restricted by said constriction, and a hairpin spring inserted in the longitudinal hole adapted to straddle the transverse hole and having one leg projecting into the transverse hole, the other leg being arranged to exert pressure against the detent member.

2. A wrench spindle and the like comprising a shank having a tool engaging section and provided with intersecting transverse and longitudinal holes, the transverse hole having a constriction adjacent one end, a detent member loose in the transverse hole protruding therefrom and restricted by said constriction and a hairpin spring inserted in the longitudinal hole adapted to straddle the transverse hole and having one leg to project into the transverse hole to be yieldingly retained in place thereby, the other leg being arranged to exert pressure against the detent member, and a coil spring in said transverse hole interposed between the hairpin spring and detent member.

3. A wrench spindle and the like comprising a shank having a tool engaging section and provided with intersecting transverse and longitudinal holes, the longitudinal hole opening from the end surface of the spindle and the transverse hole opening in opposite sides of the spindle and having a constriction adjacent one end, a detent member loose in the transverse hole protruding therefrom and restricted by said constriction, a spring in said transverse hole adapted to press against said detent member, and a member located in said longitudinal hole to retain said

spring in the transverse hole and being constantly accessible through the transverse hole.

4. A wrench spindle and the like comprising a shank having a tool engaging section and provided with intersecting transverse and longitudinal holes, the longitudinal hole opening from the end surface of the spindle and the transverse hole opening in opposite sides of the spindle and having a constriction adjacent one end, a detent member loose in the transverse hole protruding therefrom and restricted by said constriction, a spring in said transverse hole adapted to press against said detent member, and a member located in said longitudinal hole, said spring and member engaging each other to mutually maintain each other in their respective holes and being constantly accessible through the open ends of the hole.

5. A wrench spindle and the like comprising a shank having a tool engaging section and provided with intersecting transverse and longitudinal holes, the longitudinal hole opening from the end surface of the spindle and the transverse hole opening in opposite sides of the spindle and having a constriction adjacent one end, a detent member loose in the transverse hole protruding therefrom and restricted by said constriction, and a member located in said longitudinal hole to retain the detent in the transverse hole and being constantly accessible through the transverse hole.

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