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REMOVABLE BIT CONSTRUCTION FOR
SCREWDRIVERS AND THE LIKE
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Fig. 1.

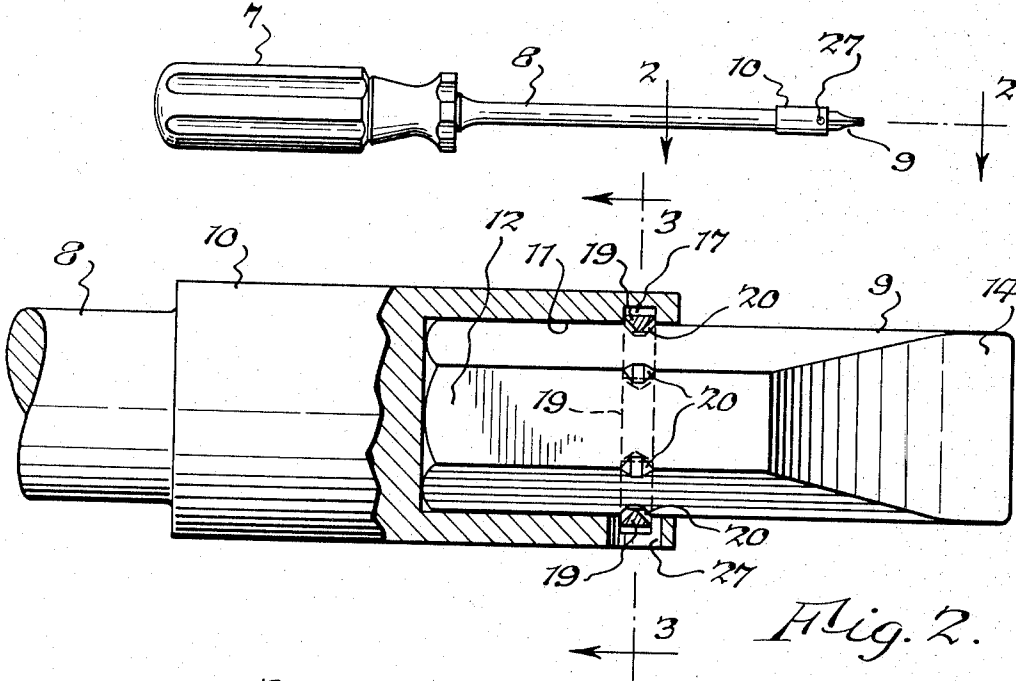


Fig. 2.

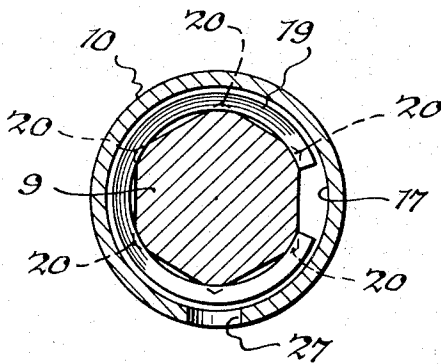


Fig. 3.

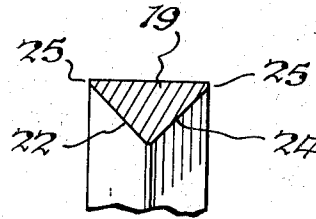


Fig. 4.

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REMOVABLE BIT CONSTRUCTION FOR SCREW-DRIVERS AND THE LIKE

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2 Claims. (Cl. 145—50)

ABSTRACT OF THE DISCLOSURE

This invention relates to screwdrivers and the like having removable bits which are held in place in a socket of polygonal cross section by means of a resilient split ring of triangular cross section having converging sides which fit into notches of the bit and having a relatively flat outer face extending between the sides of a groove in the socket, to improve the holding of the bit in the socket of the bit holder to facilitate removal of the bit from the socket.

This invention relates to implements of the type generally designated as screwdrivers for use with fastenings, such as bolts, screws and the like, and more particularly this invention relates to implements of this type having removable bits.

In the accompanying drawings:

FIG. 1 is a side view of a screwdriver having a removable bit construction embodying this invention.

FIG. 2 is a fragmentary, enlarged, longitudinal sectional view thereof on line 2—2, FIG. 1.

FIG. 3 is a transverse sectional view thereof on line 3—3, FIG. 2.

FIG. 4 is a view of a fragmentary part of a resilient ring such as may be employed for holding a bit on the shank of an implement.

FIG. 1 shows by way of example a screwdriver having a handle 7 provided with a shank 8 and a bit 9 removably secured on the shank. For this purpose the shank is provided in the end thereof opposite to the handle 7 with an enlargement 10 having a socket 11 therein.

The bit 9 has the inner end 12 thereof formed to fit snugly but removably into the socket 11. The other end 14 of the bit may be shaped to cooperate with any desired fastening device or workpiece, such for example, as a screw with a slot in the end thereof, but it will be understood that the outer end of the bit may be shaped to cooperate with any other type of screw, bolt or other fastening.

The interior of the socket 11 is of polygonal cross section, for example, hexagonal, as shown in the accompanying drawings, and the bit has its inner end formed to correspond in cross section to the interior of the socket. The inner end 12 of the bit is formed to fit against the bottom of the socket. Consequently, rotary motion of the implement is transmitted through the socket to the inner end of the bit for turning the same, and pressure against the bit is restricted by the bottom of the socket.

Means are provided for removably securing the bit within the socket so that the bit will be held in place during the use of the implement and also to permit ready removal of the bit for replacing the same if worn out or broken, or for replacing it with a bit of different size or shape. In the construction shown for this purpose the socket is provided with a circumferential groove 17 in the interior wall thereof adjacent to its open, outer end. This groove may be of any desired cross sectional shape, preferably of rectangular cross section, and is shaped to receive a resilient split ring 19 of a width to fit into the groove. Cooperation of the ring with the bit is provided

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by means of notches 20 provided in the bit, particularly at the edges of the sides thereof. During the use of the implement the ring is seated partially within the groove 17 and within the notches 20 of the bit, so that the bit is held against displacement from the groove. The groove is of a depth at least equal to the thickness of the ring in a radial direction, so that during the removal of the bit from the socket the ring may be expanded so as to move out of the notches in the bit and is fully in the groove. The resilience of the ring is such that the ring tends to contract and thus enter into the notches of the bit unless urged outwardly during the removal of the bit.

Resilient rings of circular cross section have been employed for holding a bit in a socket. I have found however that better results are obtained if the ring is made of angular cross section rather than circular. For example, I prefer to form the bit with two converging sides 22 and 24 which converge toward the axis of the bit and which fit within the notches formed in the bit. These converging sides terminate at the outer portions of the ring with edges 25. Consequently, when the ring is positioned within the groove of the socket, the two edges 25 bear against the opposite sides of the groove and thus resist the movement of the ring out of the groove. With rings of circular cross section no edges of this type are formed to engage the sides of the groove, and consequently displacement of the outer ring out of the groove may result in a camming action, which facilitates such removal and could result in the dropping of the ring out of the socket when the bit is being removed.

The removal of the ring from the socket may be supplemented by providing in the socket a transverse hole or opening 27 in registration at its inner end with the groove 17 of the socket. Consequently, when the bit is removed from the socket and it is desired to remove the ring, an object with a small end can be inserted into the hole or opening 27 to move an adjacent part of the ring out of the groove 17. The ring can then be easily engaged by a suitable hook and drawn out of the socket.

By providing the inner portion of the ring with inclined faces 22 and 24, a greater amount of contact is provided with the notches in the bit and consequently better holding characteristics.

An outstanding feature of my improved construction of the resilient ring is that the transverse dimension of the cross sectional shape of the ring in a radial direction is materially less than in a corresponding circular ring. Consequently, the groove 17 does not have to be as deep to accommodate my improved ring as it would be to accommodate a circular ring. This is important for the reason that it makes it possible to reduce the depth of the groove and also the outside diameter of the enlargement 10. This is an important advantage where close clearances are required between the implement and the parts to be secured together by fastenings.

The angular cross sectional shape of the ring also makes it easier to install the ring in the socket because the outside diameter of the ring is smaller in relation to the socket opening than a ring of circular cross section. The ring of angular cross section as herein disclosed is easier to remove from the socket for replacement because it presents a relatively flat, or at least broad surface which may be used to contract the ring for removal. The angular relation of the inner face of the ring with the notches in the bit facilitates the removal and replacement of the bit from the socket.

My improved angular ring allows considerable latitude for adjustment of holding engagement with the bit. The cross section of the ring and the notches in the bit can be an acute angle for greater holding strength or obtuse for a more yielding engagement.

It will be understood that various changes in the details, materials and arrangements of parts which have been herein described and illustrated in order to explain the nature of the invention may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. An implement including a bit holder having a socket of polygonal cross section in one end thereof,
- a bit having a part of polygonal cross section formed to enter into said socket and forming a driving fit with said socket and having an outer end extending beyond said socket,
- a circumferential groove in the inner wall of said socket adjacent to the outer end thereof,
- said bit being provided with notches in circular arrangement about said bit and,
- a resilient ring fitting into said groove of said socket and into said notches of said bit to hold said bit in said socket, said ring being of angle-shaped cross section with two converging faces extending into said

notches of the bit and with a relatively flat face extending from side to side of said groove to resist discharging said ring from said groove inadvertently.

2. An implement according to claim 1 and including a radial opening in the wall of said socket spaced from the end of the socket opening in registration with a part of said groove for insertion of an object through said opening to contract said ring and move a portion thereof out of said groove to facilitate removal of the same from said socket.

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