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[54] **KEEPER ACCESSORY FOR HOLDING A
 FASTENER SEATED IN A WRENCH SOCKET**
 8 Claims, 6 Drawing Figs.

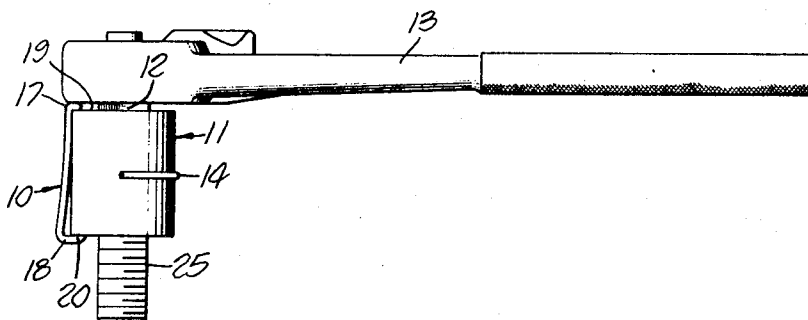
[52] U.S. Cl. **81/125**
 [51] Int. Cl. **B25b 13/02**
 [50] Field of Search **81/13, 125**

[56] **References Cited**

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ABSTRACT: A keeper accessory for use on a wrench socket to hold a fastener frictionally and rigidly captive within the socket. The accessory is designed for attachment to a twelve point socket without need for alteration in the socket. The one-piece accessory includes a hook embracing the rim edge of the fastener end and positioned to press resiliently against one face of the fastener to hold the latter captive while being manipulated into and out of alignment with another fastener part. The accessory preferably includes a second hook for locking it assembled to a socket.



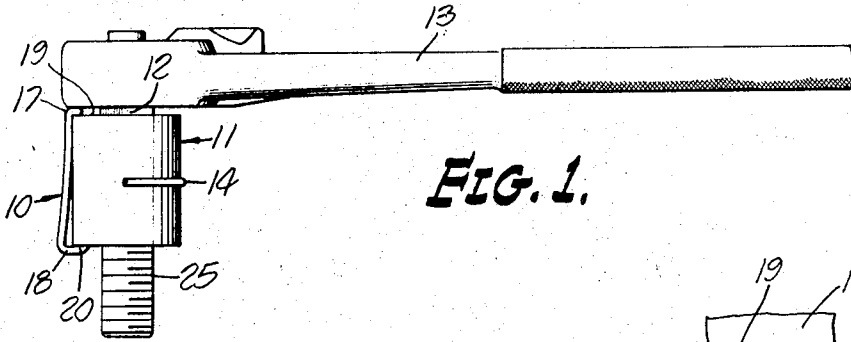


FIG. 1.

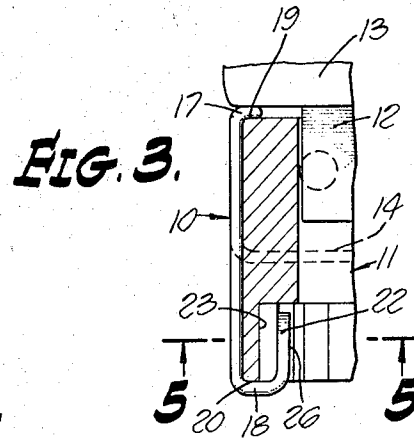


FIG. 3.

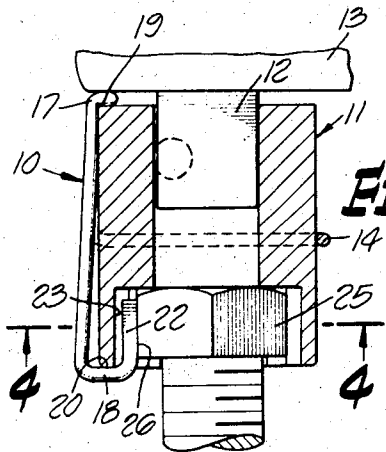


FIG. 2.

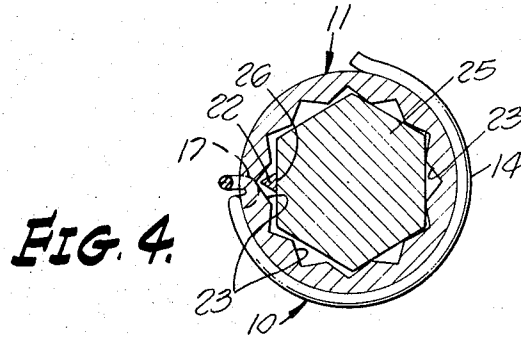


FIG. 4.

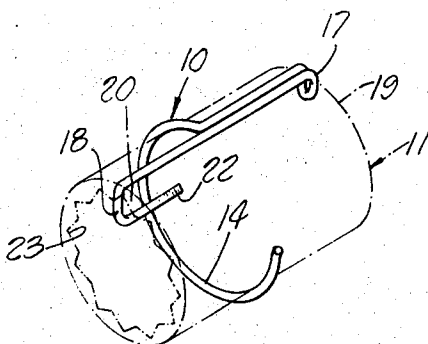


FIG. 6.

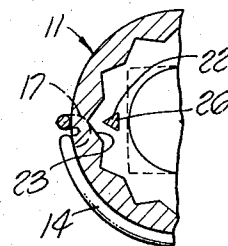
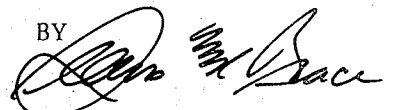


FIG. 5.

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KEEPER ACCESSORY FOR HOLDING A FASTENER SEATED IN A WRENCH SOCKET

Not infrequently mechanics have need for utilizing socket wrenches in areas not accessible to the mechanic's hand. In such cases, it can be very frustrating to retain a loose fastener part captive while either withdrawing it from another fastener part or while maneuvering it into mating relation with an opening or its companion part.

Various proposals have been made heretofore for dealing with this problem. However, each is subject to certain disadvantages and shortcomings sought to be avoided by the present invention. In general, the prior proposals are subject to one or both of the following serious disadvantages, namely, the fastener retention means occupies a portion of the wrench socket and unavoidably changes the dimension of the fastener receivable in that socket, or secondly, require alteration of the wrench to include an opening or a notch in the sidewall of the socket. For example, it has been proposed to seat a sheet metal spring fitting into the end of a socket wrench having one or more fingers engageable with the sides of the fastener but this necessarily requires that the wrench be used with a different and smaller size fastener. The second type of prior art accessory requires a specially constructed socket having an opening or slot in its sidewall adding very appreciably to the cost of the wrench and adversely affecting its strength and service life.

The present invention avoids the foregoing and other serious defects of prior fastener keeper accessories and is usable with equal facility and effectiveness on both existing or newly manufactured wrenches. The accessory is formed in one piece from resilient stock and includes a split-ring retainer loop embracing the midlength of a wrench socket. Attached to one end of this spring split-ring loop is an intumed hook shaped to embrace the inlet rim edge of the socket with the end of the hook extending into the apex of one of the twelve conventional fastener-seating notches. This intumed end of the hook is positioned to bear flush against the face of a hexagonal fastener and frictionally retain the same captive until forcibly withdrawn. Projecting in the opposite direction from the split retainer loop is a second resilient extension bearing frictionally against the sidewall of the socket. Preferably, the end of this latter member includes an intumed hook engageable in a recess of the socket or over its rear end thereby positively locking the accessory in assembled position.

It is the primary object of the present invention to provide a fastener keeper accessory for use on a 12-point socket wrench with a resilient finger engageable with one face of a hexagonal fastener to retain the same captive within the socket while being maneuvered into and out of an assembly position.

Another object of the invention is the provision of an inexpensive, durable, foolproof keeper accessory readily attachable to a 12-point wrench socket without need for any alteration in or weakening of the socket structure.

Another object of the invention is the provision of a one-piece resilient keeper accessory readily attachable to a wrench socket without need for tools and without interfering with the full effectiveness of the socket for use with the same size fastener for which it was originally designed.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the invention is illustrated:

FIG. 1 is a side elevational view of a typical conventional socket wrench having an illustrative embodiment of the invention keeper accessory attached thereto;

FIG. 2 is a cross-sectional view on an enlarged scale through the wrench socket shown in FIG. 1;

FIG. 3 is a fragmentary cross-sectional view of a portion of FIG. 2 showing the position of the keeper accessory with the fastener removed from the wrench socket;

FIG. 4 is a cross-sectional view taken along line 4—4 on FIG. 2;

FIG. 5 is a cross-sectional view taken along line 5—5 on FIG. 3; and

FIG. 6 is a perspective view of the keeper accessory showing the relationship of the same to the wrench socket, the latter being indicated in dot and dash lines.

Referring to FIG. 1, there is shown a preferred embodiment of the keeper accessory designated generally 10, mounted on a conventional 12-point wrench socket 11. As there illustrated, socket 11 is frictionally retained on the square shank 12 of a ratchet-type wrench handle 13.

The constructional details of keeper accessory 10 are best shown in FIG. 6. The accessory is formed from a single continuous length of spring wire stock and includes a split spring loop snugly embracing the exterior sidewall of socket 11. One end of loop 14 is bent to provide a pair of spaced-apart hooks 17 and 18. Hook 17 is positioned to engage over the rim edge 19 at the rear end of the socket whereas hook 18 embraces the inlet rim edge 20 and has a free end 22 extending axially into one of the twelve points 23 of the socket (FIG. 4). As is well known, the hexagonal end 25 of a typical threaded fastener can only occupy six of the 12 points 23 of the socket. Accordingly, the occupation of one of these points 23 by the fastener retention spring 22 does not interfere with the usefulness of the socket to seat a hex member in other of its points.

Desirably, the intumed end 22 of hook 18 has a flattened surface 26 lying parallel to the adjacent hex face of fastener 25. As herein illustrated, end 22 is triangular in configuration with one flat side 26 lying parallel to one face of the hexagonal fastener.

When a fastener is not present in socket 11, the accessory hook 18 is positioned as shown in FIGS. 3 and 5. However, when the hexagonal end of a fastener is pressed into the socket, hook 18 is flexed outwardly to the position shown in FIGS. 1, 2 and 4, with the flat surface 26 of end 22 pressed flush against the fastener and urging the latter to the right into firm seating engagement with certain of the seating points 23. As will be readily apparent, the rounded outer end of hook 18 acts as a pilot to guide a fastener into seated position in the socket.

Hook 17 is not essential and may be eliminated if desired. In this case the longer leg of hook 17 will bear firmly against the sidewall of the socket. This frictional pressure against the sidewall taken with the frictional pressure of the split loop 15 is substantially greater than the frictional pressure of end 22 against the fastener.

From the foregoing it will be evident that the invention accessory will be made in graduated sizes proportioned to fit a selected one of a set of wrench sockets. Each accessory is readily assembled to and removed from a socket by telescoping the accessory over the inlet end of the socket until hook 17 engages over the rear end of the socket. It is detached simply by releasing hook 17 and withdrawing the socket from the accessory.

While the particular keeper accessory for holding a fastener seated in a wrench socket herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the detail of construction or design herein shown other than as defined in the appended claims.

I claim:

1. A fastener keeper accessory adapted to be held frictionally assembled on a conventional 12-point wrench head without need for altering the wrench head structure to accommodate the keeper accessory and without interfering with the use of one hexagonally related set of points to seat the hexagonal portion of a threaded fastener and effective to frictionally hold a loose fastener of a size for which the wrench was designed captive on the wrench head while the same is being maneuvered into and out of an assembly position thereof, said accessory comprising a unitary length of stiff resilient spring stock having a first C-shaped portion the op-

posite ends of which are formed to resiliently press against the adjacent sidewall portion of a wrench to frictionally grip the wrench head and hold said keeper accessory in assembled position on said head, said unitary length of spring stock including a portion designed to extend longitudinally into one of the points of the wrench head in an area radially opposite one of said wrench head points and into snug frictional engagement with one face of a hexagonal fastener socketed in said wrench head.

2. A keeper accessory as defined in claim 1 characterized in that said first portion comprises a split ring adapted to snugly encircle the exterior midportion of a wrench socket and effective to hold said accessory resiliently and detachably assembled thereto.

3. A keeper accessory as defined in claim 2 characterized in that said unitary spring is formed from spring wire stock.

4. A keeper accessory as defined in claim 1 characterized in that the portion of said accessory adapted to seat in a point of a socket wrench is generally triangular in cross section with one face thereof positioned to press flush against one face of a hexagonal fastener when the latter is seated in a socket to which said keeper is assembled.

5. A keeper accessory as defined in claim 1 characterized in that said spring member includes a third portion adapted to lie along one side of the socket and to press resiliently inwardly against the rearward outer surface of the socket to aid in holding the same assembled to the socket.

6. A keeper accessory as defined in claim 1 characterized in that said spring member includes a third portion extending op-

positely to the fastener-engaging end thereof and formed with a detent extending radially inwardly and adapted to interlock with a complementally shaped radial ledge of a socket to hold said accessory locked in assembled position thereon.

7. A keeper accessory as defined in claim 6 characterized in that the detent of said third portion is positioned to engage over and interlock with the rear rim edge of a socket.

8. A keeper accessory readily attachable to and detachable from a conventional 12-point wrench socket without need for tools or passages through the sidewall of the socket and effective to hold a threaded hexagonal fastener captive therein of the size for which that conventional wrench socket was designed to fit, said accessory being formed in one piece from spring stock and having a split-ring portion adapted to embrace the midportion of a wrench socket and including a pair of hooked ends extending in opposite directions from said split-ring portion, one of said hooked ends being shaped to engage over the rim edge at the open forward end of a socket with the hook end projecting lengthwise along one of the 12 points thereof between a pair of points to either side thereof to resiliently press against a face of a hexagonal fastener when seated in said socket to hold the latter captive in the socket, and the other of said hooked ends being positioned to engage over a rearwardly facing radially disposed surface of the socket and cooperable with said first mentioned hooked end and with said split-ring portion to hold the keeper accessory detachably assembled to a wrench socket. assembled to a wrench socket.

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