Dec. 25, 1962 A. J. ZILLIOX 3,069,946

PART GRIPPING DEVICE FOR HAND TOOLS

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Fig. 1.

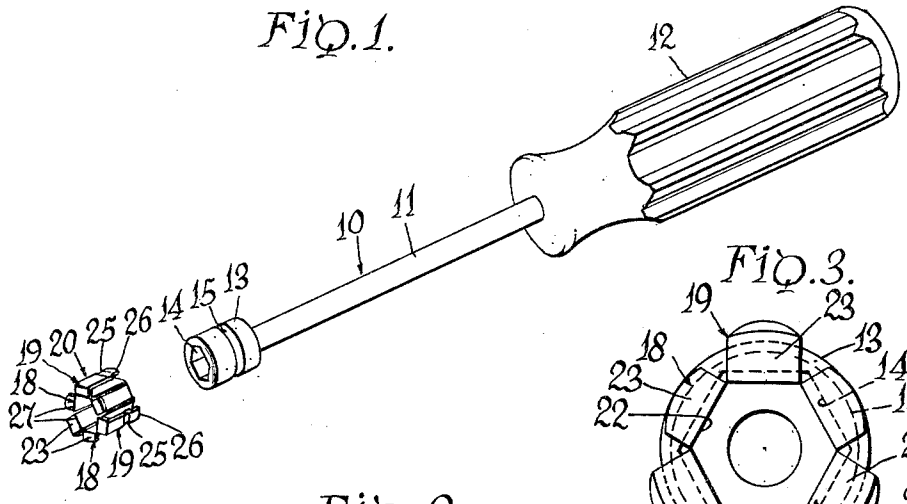


Fig. 3.

Fig. 2.

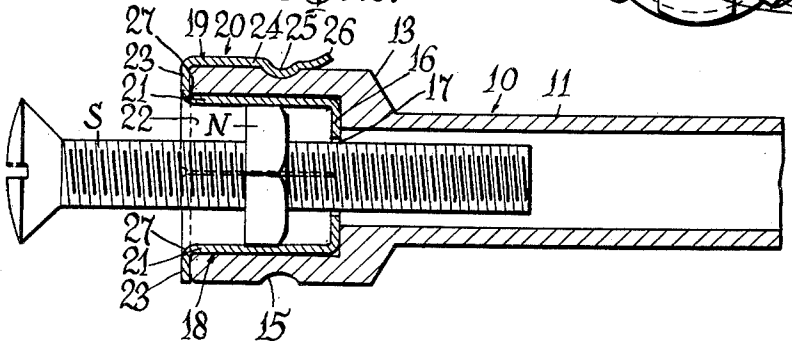
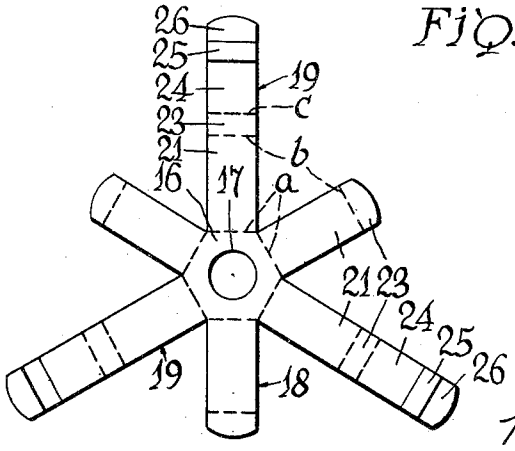


Fig. 4.



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PART GRIPPING DEVICE FOR HAND TOOLS

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1 Claim. (Cl. 81—125)

My invention relates to hand tools and more particularly to an improved device detachably securable in the polygonally shaped socket of a hand tool for the purposes of receiving, gripping and detachably securing a hexagonally shaped nut, the head of a cap screw or bolt or any one of several different tools in said device.

An object of my present invention is to provide a simple and inexpensive device which is formed to be readily detachably secured in the socket of a hand tool for the above said purposes.

Another object is to provide such a device which will only reduce the tool socket in which it is inserted by a single size.

Another object is to provide such a device which notwithstanding its light shell construction is sturdy, strong and durable.

Another object is to provide such a device wherein the width of its part gripping spring legs may be substantially coextensive with the sides of parts grippable thereby, for substantially full engagement therewith in manipulating said parts.

These and other objects, advantages and characterizing features of my invention will appear from a perusal of the following detailed description of a presently preferred form thereof shown in the drawing wherein:

FIGURE 1 is an exploded perspective view showing one form of socket hand tool, i.e. a nut driver, adapted for use with a device constructed in accordance with the principle of my invention and showing said device ready to be inserted in the socket of said tool.

FIGURE 2 is an enlarged fragmentary sectional view of the tool shown in FIGURE 1 with my device detachably secured therein and gripping a hexagonally shaped nut carried by a screw.

FIGURE 3 is an elevational view of the outer end of my device and shows that the width of the part gripping surfaces are substantially coextensive with the sides of the tool socket for full engagement with the sides of the part inserted therein, and

FIGURE 4 is an elevational view of a blank before it is formed to provide my device.

Referring now to the drawing, wherein like reference numerals indicate like parts in the several views, my present invention, by way of illustration, has been shown in use with a modified hand tool known as a nut driver and generally indicated by the numeral **10**. The nut driver **10** comprises a tubular shaft **11** having a handle **12** secured to one of its ends and an enlarged head **13** secured to its opposite end. The head **13** is formed with a polygonal shaped socket **14**, and for the purpose of being used with my polygonal shaped polygonal part holding device, generally indicated by the numeral **20**, has its periphery intermediate its ends formed with a circumferentially extending groove **15** of semicircular cross section to detachably receive therein certain leg portions of my device whereby said leg portions serve to detachably secure the device to the head **13**.

The part **20** is formed, as shown in FIGURE 4, from spring sheet material, preferably although not necessarily steel, having a thickness in the order of .014 of an inch with a hexagonally shaped central portion **16** having its center provided with a hole **17**, and having each of its sides extended by a shorter leg **18** or a longer leg **19**. The legs **18** and **19** are preferably arranged in spaced

alternate relation one to the other and extend radially from the center of portion **16** so that when they are bent along the planes indicated by the broken lines "*a*" in FIGURE 4 to lie substantially normal thereto, the shorter legs **18** are disposed diametrically opposite to the longer legs **19** and said legs form the resilient side portions **21** of a hexagonally shaped shell socket member **22**. The outside area of the socket member **22** is slightly less than the area of the walls of the socket **14** to allow the ready insertion of the socket member **22** into and its removal from the socket **14** and also to allow for slight outward springing movements of the side portions **21**. In order that the side portions **21** may detachably engage, grip and hold the part in the socket member **22** they must have a slight mutual spacing of their side edges to provide for their slight movement during the insertion of the part to be held, the normal spacing of the legs **18** and **19** being shown in broken lines in FIGURE 2.

Since the sizes of tool sockets, tool adjuncts and the nuts and bolt heads of fastening devices with which my device is useable are provided in successive increments of 1/32 or .03125 of an inch, it will be apparent that, because the thickness of the walls of the portions **21** are in the order of .014 of an inch, a socket tool provided with my device will preferably fit, grip and hold the next smaller tool adjunct or fastening device.

As shown in FIGURE 4, the legs **18** and **19** outwardly of the bends at "*a*" are each also reversely bent along the plane of the broken lines "*b*" to provide the radially disposed stop shoulder portions **23** which engage the outer face of the socketed end of the head **13** and thereby locate the portion **16** from said face a predetermined distance, which may be that shown in FIGURE 2 or a lesser distance so long as the socket **22** is of sufficient depth to receive and properly grip a part. In FIGURE 2 such a part is shown as a nut N carried by a screw S.

The longer legs **19** are also transversely bent in the plane of the broken bend lines "*c*" of FIGURE 4 to provide reversely directed portions **24** which, as shown in FIGURE 2, extend in substantially parallel outwardly spaced relation to the associated leg portions **21** thereby to frictionally engage the peripheral face of the socket head **13**. In order to prevent inadvertent displacement of the device **20** from the head **13** each of the leg portions **24** is formed with an inwardly extending rib **25** located to interengage in the groove **15** as shown in FIGURE 2. To facilitate engagement of the device **20** on the head **13** the leg portions **24** are provided with outwardly directed terminal extensions **26**. The socket member **22** has its outer edge somewhat rounded as at **27** to facilitate the insertion of the part to be held.

From the foregoing description it will be understood that the construction of my device is such that it may be combined with a number of different suitable socketed hand tools, for use in picking up one size of nut or like part, and for use in securing a nut or part onto or removing it from a threaded part located in a more or less inaccessible position without inadvertent displacement or dropping of said nut part therefrom.

I claim:

In combination with a hand tool having a tubular shaft provided with a head portion formed with a hexagonal socket terminating in an inwardly directed shoulder and externally provided with a peripheral groove, a hexagonally shaped socket member fitted in said socket and serving to reduce the effective diametrical dimension of the socket by one size; such socket member being formed of a light gage resilient metal and comprising a hexagonally shaped bottom wall located adjacent said shoulder and having a central opening, the bottom wall having parallel legs extending severally from its six sides, the legs being

substantially parallel to and normally slightly spaced from the walls of the socket and terminating at their outer ends in outwardly and radially extending shoulder parts which abut the front edge face of the head portion, certain of said legs having portions inwardly directed from said shoulder parts, overlying the peripheral face of the head and each formed with an inwardly extending rib for engagement in said peripheral groove, thereby to prevent the displacement of the socket member from the socket of the head portion, the socket member being of rounded formation at the juncture of the legs and the radially extending shoulder parts, thereby to facilitate insertion of the part to be held.

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