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B. J. LENZ

2,651,229

COMBINED SOCKET WRENCH AND NUT-EJECTOR

Filed July 31, 1950

Fig. 1

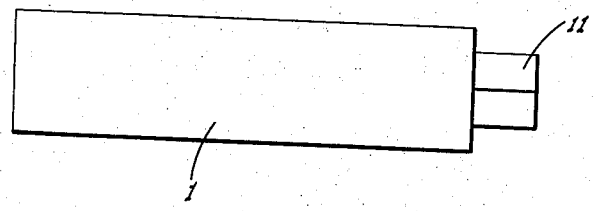


Fig. 2

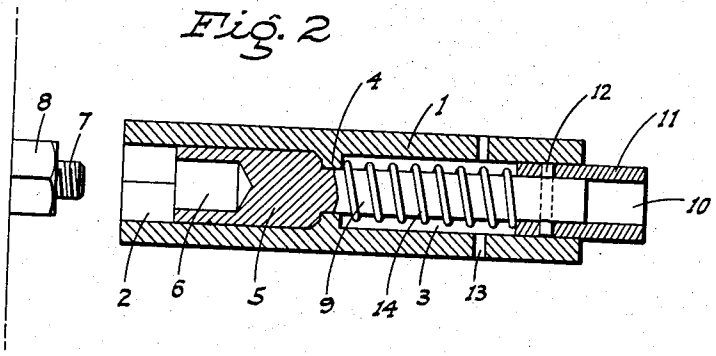


Fig. 3

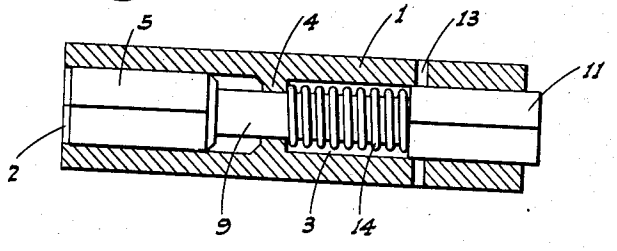


Fig. 4

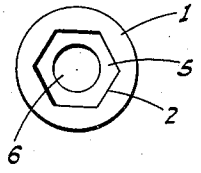
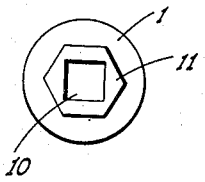


Fig. 5



Inventor

Bernhart J. Lenz

By

ATTORNEY

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COMBINED SOCKET WRENCH AND NUT EJECTOR

Bernhart Joseph Lenz, Merced, Calif., assignor of one-half to Orville W. Shelton, Carmel, Calif.

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3 Claims. (Cl. 81—124.1)

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This invention is directed to, and it is an object to provide, an improved socket wrench.

An important object of the invention is to provide a socket wrench which is operative, after removal of a nut from a bolt and at which time the nut frequently sticks in the socket, to eject the nut from the latter for ready manual recovery.

An additional object of the invention is to construct the socket wrench in a manner such that the torque applied to the wrench to loosen a nut cannot work to the detriment of or damage the axially slidable parts, which the device includes, to cause ejection of the nut from the socket, as aforesaid.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of the socket wrench.

Fig. 2 is a sectional elevation of the same in normal position.

Fig. 3 is a similar view, but shows the wrench in nut ejecting position.

Fig. 4 is a front end view of the wrench.

Fig. 5 is a rear end view of the wrench.

Referring now more particularly to the characters of reference on the drawings, the improved socket wrench comprises a body 1 in the form of a tubular, elongated sleeve; such body being formed at its forward end portion with a socket 2 and at its rear end portion with a bore 3. The socket 2 and bore 3 are non-circular in cross section and preferably have a hexagonal configuration; there being an annular internal stop 4 between said socket 2 and bore 3.

A non-circular, push-out head or plunger 5, likewise preferably hexagonal in cross section, engages in matching, axially slidable relation in the socket 2. The inner end of the plunger 5 normally engages in abutting relation against the stop 4, and at such time the outer end of said plunger is disposed a considerable distance short of or inwardly from the outer end of said socket 2.

The plunger 5 is formed with a recess 6 which opens to the outer end of said plunger for the reception of the free end of a bolt 7 when a nut 8 on said bolt is engaged in the socket 2.

A reduced-diameter stem 9 is formed integral with, and projects axially in a rearward direction from, the plunger 5 and through the annular internal stop 4 and bore 3.

At its rear end portion the stem 9 projects

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into the bore 10 of a connector shank 11; these parts being secured together by a cross pin 12. The connector shank 11 is non-circular in cross section, preferably hexagonal, and runs with a matching fit in the non-circular bore 3.

Diametrally alined holes 13 in the tubular sleeve 1 permit of placement or removal of the cross pin 12, but said holes 13 are in a position normally out of alinement with said cross pin; i. e. ahead of the latter.

A compression spring 14 surrounds the stem 9 between the annular internal stop 4 and the inner end of the connector shank 11; such spring thus normally urging the plunger 5, stem 9, and shank 11 to their rearmost point, and at which time the plunger 5 occupies a retracted position against the stop 4, as aforesaid. At the same time the connector shank 11 projects some distance out of the rear end of the tubular sleeve 1.

When the above described socket wrench is in use the shank 11 is engaged with a socket wrench handle or speed wrench; the engagement being either on the non-circular outside of said shank or into the bore 10, depending on the type of tool handle. The bore 10 is non-circular in cross section, and preferably square.

With the socket wrench thus handle-mounted for use a nut 8 is engaged in the socket 2, whereupon the device is rotated in a direction to unthread the nut 8 from the bolt 7. When such unthreading occurs the nut 8 would quite frequently stick in the socket 2, making its removal difficult and inconvenient were it not for the nut ejection which the present device accomplishes by relative forward thrusting of the plunger 5 with respect to the tubular sleeve 1. This is accomplished easily by pulling rearwardly on the tubular sleeve 1 after the nut 8 is freed from the bolt 7 and remains in the socket 2. As the tubular sleeve 1 is pulled rearwardly the plunger 5 thrusts relatively forward, pushing the nut out of socket 2 for ready manual recovery.

By virtue of the fact that the plunger 5 and connector shank 11 are engaged in matching relation in the non-circular socket 2 and non-circular bore 3, respectively, the torque applied to the connector shank 11 by the wrench handle is transmitted to the plunger 5 by the sleeve 1, thereby relieving the reduced-diameter stem 9 from strain and possible breakage.

The device, while simple in its structure and capable of facile and economical manufacture, is nevertheless sturdy, practical, and convenient; being a most useful mechanic's tool.

From the foregoing description it will be readi-

ly seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A socket wrench comprising a tubular sleeve having a non-circular socket open to the front end thereof, a plunger slidable in matching relation in the socket, the forward end of the plunger normally being short of the corresponding end of the socket, a connector at the rear of the sleeve for a socket wrench handle, said connector being slidable but non-turnable in the sleeve and projecting from the rear end thereof, a stem of reduced size extending between adjacent ends of the plunger and connector, a stop in the sleeve against which the rear end of the plunger normally seats, and a helical compression spring about the stem between the stop and connector yieldably maintaining the plunger against said stop.

2. A socket wrench comprising a tubular sleeve having a non-circular socket open to the front end thereof, and a non-circular bore open to the rear end, there being an annular stop in the sleeve between the socket and bore, a plunger slidable in matching non-turnable relation in the socket, the rear end of the plunger normally seating against the stop and the forward end of said plunger then being short of the corresponding end of the socket, a wrench handle connector

slidable in the bore in matching non-turnable relation and projecting out of the rear end of the latter, a stem extending between and fixed to the plunger and connector for axial motion of said parts as a unit, and a helical compression spring between the stop and the connector.

3. A socket wrench comprising a tubular sleeve having a non-circular socket open to the front end thereof, an annular stop in the sleeve at the inner end of the socket, a plunger shorter than the socket and non-turnably slidable therein, a stem projecting from the plunger through the stop to adjacent the rear end of the sleeve, a wrench-engaging connector-shank slidable in the rear portion of the sleeve and engaged over the adjacent end of the stem, a cross pin through the shank and stem, a spring about the stem between the shank and stop holding the plunger retracted in the sleeve and a portion of the shank projecting from the sleeve, but the pin being then concealed by the sleeve; the latter having a transverse bore therethrough as large as the pin to aline with said pin when the shank is projected a predetermined distance into the sleeve against the resistance of the spring.

BERNHART JOSEPH LENZ.

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