

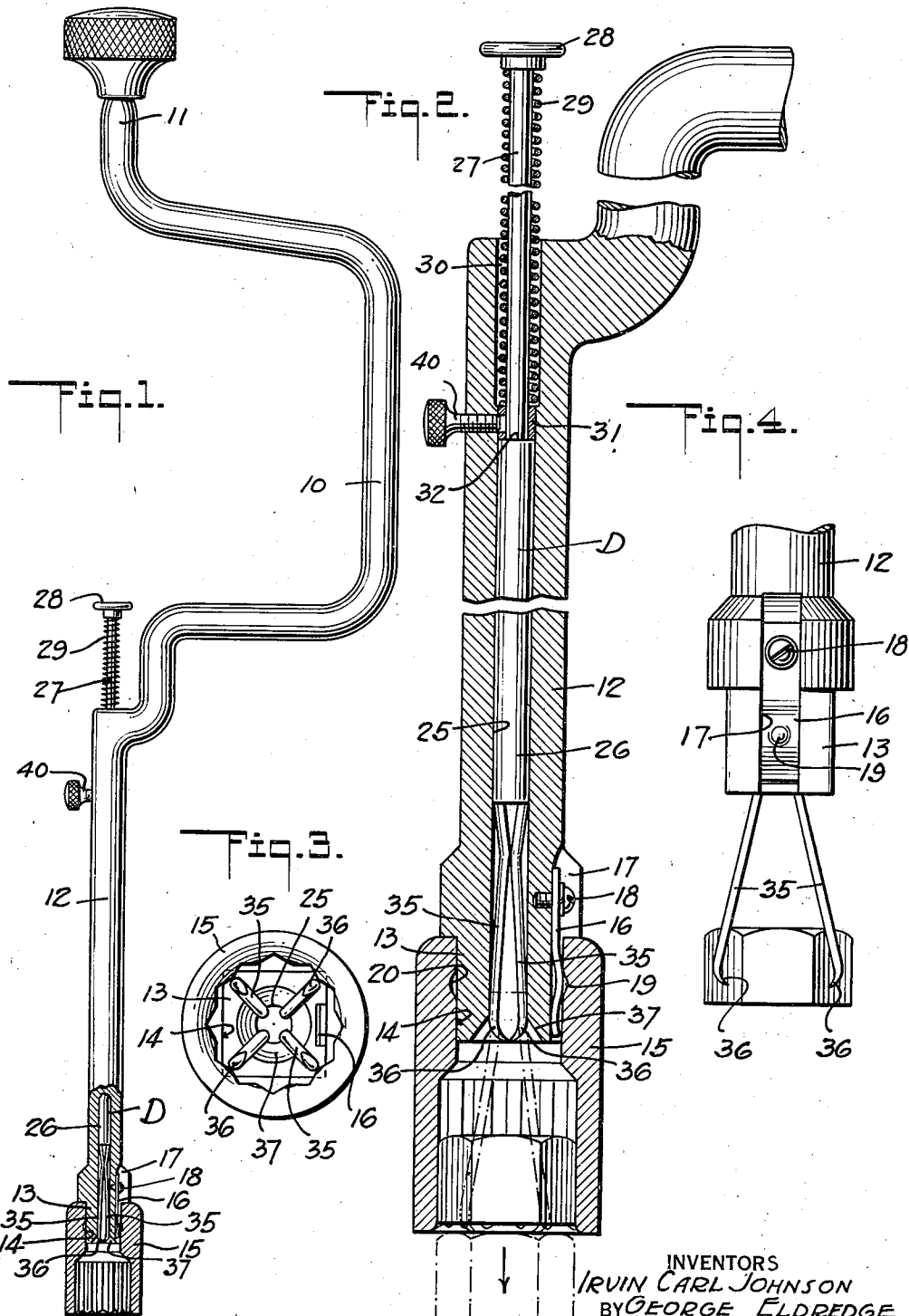
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EXPULSION SPEED WRENCH

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EXPULSION SPEED WRENCH

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6 Claims. (Cl. 81—124.1)

This invention relates generally to mechanic's tools, and particularly to wrenches.

An object of the invention is to provide a wrench embodying means by which a nut or the head of a bolt can be ejected from the socket of the wrench so as to facilitate the use of the wrench when operating upon nuts and bolt heads which fit too snugly in the wrench socket to drop or be easily shaken therefrom.

Another object of the invention is to provide a wrench of the above described character wherein the nut ejecting means can be adjusted to function as a stop in defining a socket of less depth to facilitate handling of nuts and bolt heads of various thicknesses.

A further object of the invention is to provide a socket wrench with which sockets for nuts of different sizes can be removably associated, and the nut ejecting means utilized as a means to start nuts, bolts or screws in inconvenient positions and to pick up small parts in locations inaccessible by hand.

With these and other objects in view, the invention resides in the combinations, arrangements and functional relationships of elements as set forth in the following specification, and particularly pointed out in the appended claims.

In the accompanying drawing,

Figure 1 is a view in side elevation partly broken away, of a wrench embodying this invention;

Figure 2 is an enlarged fragmentary sectional view of the shank portion and socket of the wrench;

Figure 3 is a view in elevation of the socket end of the wrench;

Figure 4 is a fragmentary view in side elevation, illustrating the use of the wrench as a nut starter or part pick-up device.

Referring specifically to the drawing, the wrench embodying this invention comprises a U-shaped stock 10 forming a crank handle and terminating in a knob carrying portion 11 and a co-axially related shank 12 the free end of which latter is provided with a non-circular head 13 in the present instance square in cross section, to slidably and removably fit in the square bore 14 of a nut and bolt head receiving socket 15 of the twelve point type as illustrated in Figure 3. The socket 15 is frictionally held against displacement from the shank 12 by a leaf spring 16 which is secured in a slot 17 in the shank by a screw 18, and the other end of which is provided with a teat 19 adapted to snap into any one of four recesses 20 in the flat walls of the bore 14.

The shank 12 is provided with an axial bore 25 in which is mounted a combined ejector and pick-up device D composed of a push rod 26 slidable freely in the bore 25 and having an actuating portion 27 of reduced diameter at one end, provided with a push knob 28 and surrounded by a coil spring 29.

The spring 29 enters an enlarged portion 35 of the bore 25 and seats against one end of a bushing 31 which has a press fit in the bore, the spring normally urging the push rod 26 to the retracted position shown in full lines in Figures 1 and 2, wherein an annular shoulder 32 on the rod seats against the opposite end of the bushing.

The outer end of the rod 26 is provided with a plurality of ejector members 35 in the form of spring wire fingers normally urged radially outward to an expanded position and provided at their free ends with claws 36.

Under the action of the spring 29, the members 35 are retracted into the bore 25 by camming contact with an annular cam surface 37 forming a flaring mouth of the bore, which surface moves the members to a contracted position as the members are drawn into the bore.

A locking screw 40 threaded into the shank 12 and through the bushing 31 is adapted to be screwed against the reduced portion 27 of the push rod 26 to lock the latter in any partially projected position against the action of the spring 29, whereby to enable the free ends of the members 35 to function as an abutment reducing the effective depth of the socket 15 for nuts and bolt heads of various thicknesses.

In operating the wrench, and assuming that a nut is to be discharged from the socket, it is only necessary that the knob 28 be pressed sufficiently for the members 35 to be advanced into the socket and engaged with the nut to eject same from the socket, it being noted that as the members 35 are advanced from the bore 25, they expand radially by virtue of their resiliency, until they strike the internal wall of the socket as shown in Figure 3. In this position, the members are disposed to push the nut clear of the socket in response to continued advancing movement of the push rod 26 as shown in broken lines in Figure 2.

To use the members 35 to start nuts or bolts or to pick up small parts in locations inaccessible to the hands, the socket 15 is removed from the head 13 so that by pressing upon the knob 28, the members 35 will be projected from the head to occupy relatively widely spread or expanded positions to receive a nut, bolt head or

other article to be manipulated. Upon releasing the knob 28, the action of the spring 29 in tending to retract the push rod 26 will contract the members against the cam surface 37 and cause the claws 36 to firmly grip the article, as shown in Figure 4, for manipulation of the article as desired.

What is claimed is:

1. A tool of the class described comprising: a handle having a shank provided with means for removably supporting a wrench socket on the shank; an ejector mounted in the shank for movement from retracted to projected position; means urging the ejector to retracted position; the ejector having resilient fingers urged to relatively spread positions when exposed from the shank in the projected position of the ejector for gripping of an article between the fingers upon retraction of the ejector under the action of said urging means.

2. A tool of the character described comprising: a handle having a tubular shank provided with a non-circular head on which a wrench socket can be removably fitted; a rod slidably mounted in the shank and having resilient fingers normally urged to a relatively spread position and adapted to eject a nut or bolt head from the socket upon actuation of the rod to a projected position; and means co-acting with said rod to urge the latter to a retracted position wherein said fingers will be contracted into the bore of the shank, said fingers being adapted to receive a nut or other article therebetween when projected from the shank in the absence of a socket therefrom, so as to co-act in gripping the article under the action of said urging means in tending to contract the fingers into the bore of the shank.

3. A tool of the character described comprising: a handle having a tubular shank provided with a non-circular head on which a wrench socket can be removably fitted; a rod slidably mounted in the shank and having resilient fingers normally urged to a relatively spread position and adapted to eject a nut or bolt head from the socket upon actuation of the rod to a projected position; means co-acting with said rod to urge the latter to a retracted position wherein said fingers will be contracted into the bore of the shank; said fingers being adapted to receive a nut or other article therebetween when projected from the shank in the absence of a socket therefrom, so as to co-act in gripping the article under the action of said urging means in tending to contract the fingers into the bore of the shank; and means co-actable with the shank and rod

to maintain the latter in various projected positions against the action of said urging means for the purpose described.

4. A tool of the class described comprising: a handle having a shank provided with a longitudinal bore therethrough; a non-circular head on one end of said shank, adapted to removably receive a wrench socket; a push rod slidably mounted in said bore and having an actuating portion projecting from the other end of the shank; means defining a stop in said bore with which the rod co-acts to limit movement of the latter in one direction; a coil spring surrounding said actuating portion and co-acting with said stop means in urging the rod in said one direction; and a plurality of spring fingers on the free end of the rod and having claws adapted to co-act in gripping an article when the fingers are projected from said bore.

5. A tool of the class described comprising: a handle having a shank provided with a longitudinal bore therethrough; a non-circular head on one end of said shank, adapted to removably receive a wrench socket; a push rod slidably mounted in said bore and having an actuating portion projecting from the other end of the shank; means defining a stop in said bore with which the rod co-acts to limit movement of the latter in one direction; a coil spring surrounding said actuating portion and co-acting with said stop means in urging the rod in said one direction; a plurality of spring fingers on the free end of the shank and having claws adapted to co-act in gripping an article when the fingers are projected from said bore; and a set screw threaded into said shank for co-action with the push rod in maintaining the latter in various projected positions against the action of said spring for the purpose described.

6. A tool of the class described comprising: a stock having means for supporting a wrench socket; an ejector mounted in the stock for movement from retracted to projected position for ejection of a nut or bolt head from the wrench socket; means urging the ejector to retracted position; the ejector having gripping elements; and means urging said elements to relatively spread positions when exposed from the shank in the projected position of the ejector, for gripping of an article by said elements upon retraction of the ejector under the action of the ejector urging means.

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