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W. C. STOWE ET AL.

1,615,201

SOCKET WRENCH

Filed Feb. 14, 1924

Fig. 1.

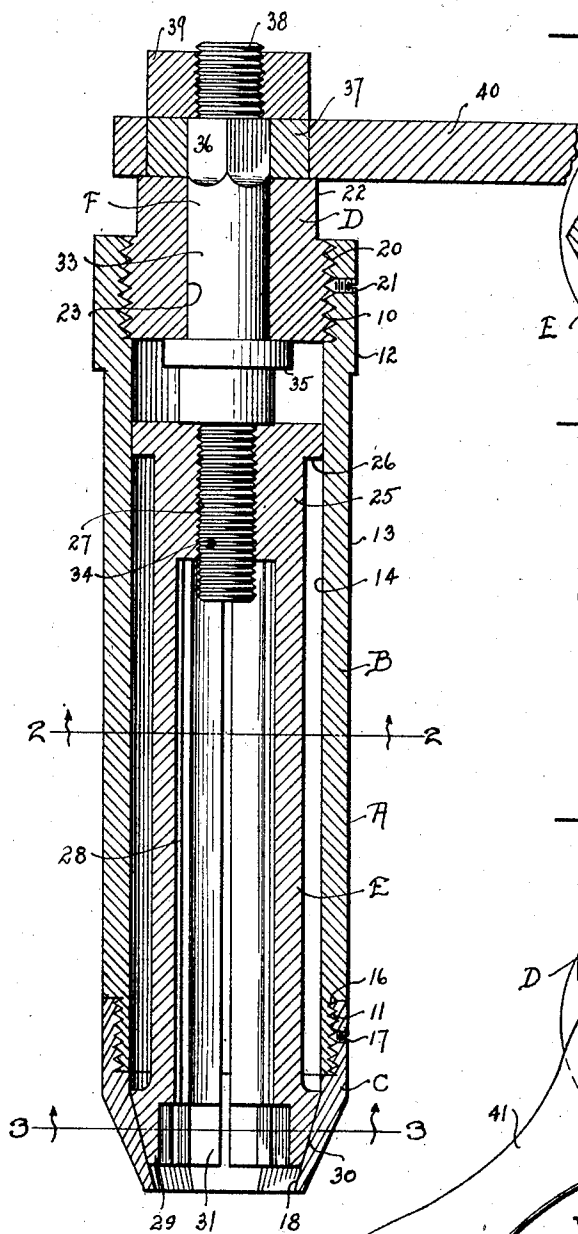


Fig. 2.

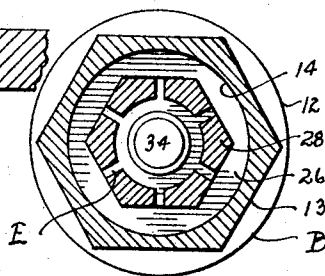


Fig. 3.

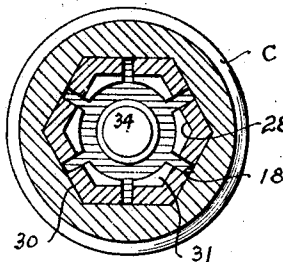
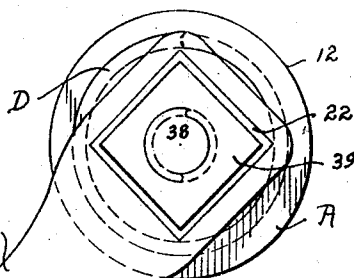


Fig. 4.



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SOCKET WRENCH.

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This invention relates to socket wrenches and it is the principal object of the invention to provide wrenches which are particularly well adapted for use in the removal of spark plugs from internal combustion engines, the wrenches being so constructed that they may be fitted over spark plugs and engage wrench heads thereon without contacting with any of the porcelain or other frangible parts which are easily broken; and, to provide adjustable socket wrenches which are simple and cheap to manufacture, easy to assemble, and easily and quickly operated.

Other objects and advantages will appear in the following detailed description, taken in connection with the accompanying drawing, forming a part of this specification, and in which drawing,

Fig. 1 is a longitudinal sectional view through the improved socket wrench, showing a fragment of an auxiliary wrench which may be employed to adjust or fit the socket wrench to the wrench head of a spark plug or similar object;

Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 1; and

Fig. 4 is a top plan view of the socket wrench, showing an auxiliary wrench which may be employed to operate the socket wrench, after it has been adjusted or fitted to an object.

In the accompanying drawing, wherein similar reference characters designate corresponding parts throughout the several views, the letter A indicates the main body portion of a wrench including a tubular sleeve B, a cap C, and a head or block D; E a socket member; and F, means for adjusting the socket member E longitudinally within the sleeve B.

Referring now to the tubular sleeve B, the same preferably is open at both ends in order that access may be readily obtained to the interior thereof, and has the one end interiorly screw threaded as at 10 and the opposite end exteriorly screw threaded as at 11. If desired, the head 12 of the sleeve B may be circular in formation, and the exterior walls 13 so formed as to render the sleeve B polygonal in cross section in order to provide a good gripping surface. The interior wall 14 preferably is circular in formation in order that the parts within

may be easily reciprocated without a binding action.

A cap C provided with internal screw-threads 16 in the one end thereof may be screwed on to the external screw threaded end 11 of the sleeve B and suitably locked thereon by means of a set-screw 17. This cap C has its one end portion provided with internal flat cam faces 18 in outwardly converging relation so as to provide a polygonal shaped recess. These faces 18 combined with a portion of the socket member E, which will later be described, provide means for preventing rotation of the socket member E within the sleeve B.

The head or block D may be provided at the one end with external screw threads 20 for securing the same to the internal screw threads 10 provided in one end of sleeve B, and may be securely locked in place by means of a set-screw 21. This head D preferably projects beyond one end of the sleeve B as at 22, said projecting portion preferably being polygonal in cross section so as to provide a wrench head over which the socket of an ordinary wrench may be fitted so that the main body portion A may be operated after the socket member E, which will subsequently be described, has been adjusted to an object. This head D is also provided with a central bore 23.

Referring now to the socket member E which is adapted to be positioned within the sleeve B, the same preferably comprises a head 25 around the top of which may be formed an outwardly extending annular flange 26 which is adapted to engage the inner wall 14 of the sleeve B and hold the head 25 in spaced relation thereto so as to obviate the liability of a binding action when the socket member E is reciprocated within the sleeve B. A central screw-threaded bore 27 is provided in the head 25 of the socket member E. Extending from the head 25 are a plurality of spaced spring jaws 28, said jaws preferably being relatively long and normally parallel, the outer ends 29 forming a polygonal shaped portion, the outer flat faces 30 of which are adapted to engage the flat faces 18 of the cap C. It can readily be seen that by such a construction the socket member E will be effectively prevented from rotary movement within the sleeve B when the socket member E is reciprocated within the sleeve B for the purpose of contracting or expanding

the spring jaws 28. The spaced spring jaws 28 form a socket opening 31, in which may be inserted the wrench head of a spark plug or similar object which it is desired to grasp.

Concerning the means for adjusting the socket member E longitudinally within the sleeve B, it is herein shown as comprising an operating shank 33 which extends through the central bore 23 in the head D and is provided on its inner end with a screw-threaded stem 34 which is adapted to engage the screw threaded bore 27 in the head 25 of the socket member E in order that movement may be imparted to the socket member E longitudinally of the sleeve B for the purpose of contracting or expanding the spring jaws 28. A shoulder 35 may be formed on the shank 33 which is adapted to lie adjacent the bottom surface of the head D, the shoulder 35 being of larger diameter than the bore 23 in the head D to prevent its removal therethrough. The outer end of the operating shank 33 may be provided with a squared end portion 36 which projects beyond the head D and is adapted to receive a nut 37 having an opening therein corresponding to the squared end portion 36. The extreme outer end 38 of the operating shank 33 may be provided with screw threads, and upon which a nut 39 is adapted to be threaded in order that the nut 37 may be securely locked to the squared end portion 36 of the operating shank 33. By so forming the outer end of the operating shank 33 and by securing the nuts 37 and 39 thereto, a means has been provided for rotatably securing the operating shank 33 to the head D, and, by fitting the socket of an auxiliary wrench 40 to the nut 37, as is clearly shown in Figure 1 of the drawing, rotary movement may be imparted to the operating shank 33, which, due to the screw threaded stem 34 be fitted in the screw threaded bore 27 provided in the head 25 of the socket member E, for adjusting the socket member E within the sleeve B and cause the spring jaws 28 to be contracted or expanded.

In operation, when it is desired to fit an object such as the wrench head of a spark plug in the socket opening 31 of the socket member E, the operating shank 33 is rotated through the medium of a suitable auxiliary wrench 40 so that the socket member E will be drawn up into the sleeve B in order that the spring jaws 28 may open to their fullest extent. The desired object is then fitted within the socket opening 31 and the

operating shank 33 rotated in the opposite direction which will contract the spring jaws 28 and firmly grasp the object. An auxiliary wrench 41 may be fitted to the head D of the main body portion A, and by rotating the main body portion A in the desired direction, the object grasped by the spring jaws 28 may be removed or replaced as the case may be.

From the foregoing description it can readily be seen that socket wrench has been provided which is extremely simple in construction, consisting of a relatively few parts which may be quickly assembled or disassembled, and may be placed upon the market at a relatively low cost.

Changes in details may be made to the form of invention herein shown and described, without departing from the spirit of the invention or scope of the claim.

We claim:

A wrench comprising a tubular sleeve circular in cross-section throughout the greater portion of its length and having its lower end portion tapered and polygonal in cross-section to provide flat jaw-engaging faces, a head removably secured in the upper portion of said sleeve and having an axially disposed passage circular in cross-section, said head extending above the sleeve and having wrench-engaging side faces, a shaft journaled in the passage of said head and having a collar engaging the inner end face of said head, the inner end portion of said shaft being reduced and threaded and the upper portion extending above the head and polygonal in cross-section and having a reduced and threaded upper end, a wrench-receiving nut upon the polygonal portion of said shaft and a securing nut upon the threaded upper end portion engaging the wrench-engaging nut, and a gripping element slidable longitudinally in said sleeve and having a block screwed upon the threaded lower end portion of said shaft and provided with an annular flange engaging the walls of the sleeve, and resilient arms extending downwardly from said block and terminating in jaws angular in cross-section and having downwardly converging outer faces engaging the jaw-engaging faces of said sleeve and adapted to have movement radially of the sleeve when said shaft is rotated and the gripping element moved longitudinally in the sleeve.

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