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1,507,362

J. BARTOSIK

WRENCH

Filed April 23, 1923

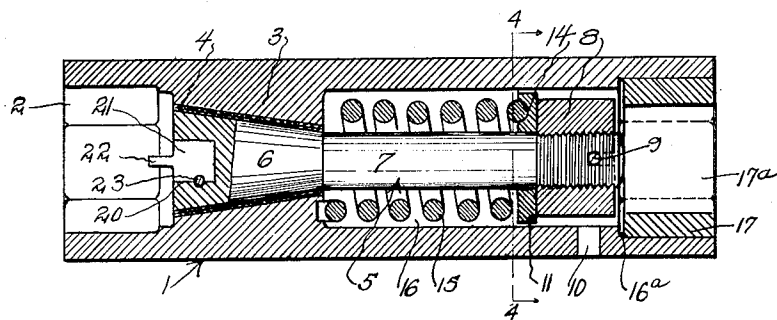


FIG. 1

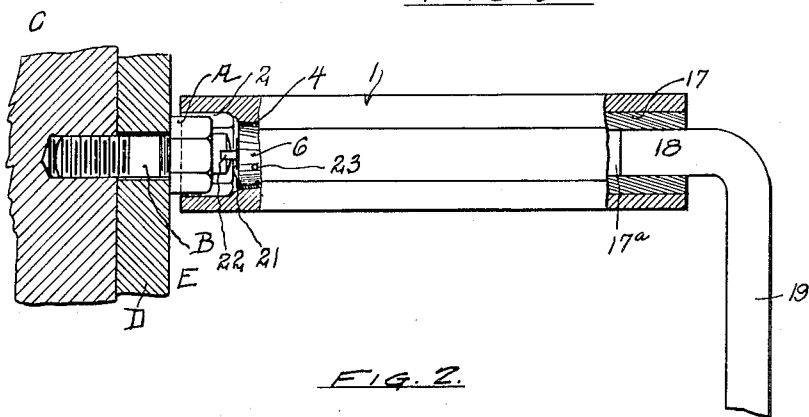


FIG. 2

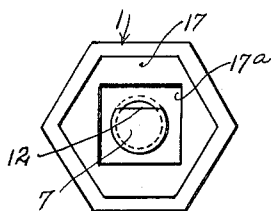


FIG. 3

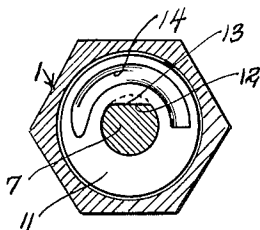


FIG. 4

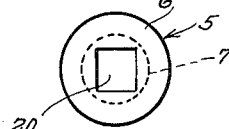


FIG. 5

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UNITED STATES PATENT OFFICE.

JOSEPH BARTOSIK, OF MONESSEN, PENNSYLVANIA.

WRENCH.

Application filed April 23, 1923. Serial No. 634,109.

To all whom it may concern:

Be it known that I, JOSEPH BARTOSIK, a citizen of the United States, residing at Monessen, in the county of Westmoreland and State of Pennsylvania, have invented new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to wrenches, and more particularly to a wrench specially adapted for use in removing and replacing the heads of internal combustion engines.

One of the main objects of the invention is to provide a wrench of simple construction and operation by means of which the studs and the nuts threaded on the upper ends thereof for securing the engine head may be readily removed or applied, as the case may be, as a unit. A further object is to provide simple and efficient means which insures proper tightening of the studs and nuts. Further objects will appear from the detailed description.

In the drawings:—

Figure 1 is a central sectional view through the wrench;

Figure 2 is a side view of the wrench, partly in section, illustrating its use;

Figure 3 is an end view of the wrench taken from the end opposite to the nut-receiving end;

Figure 4 is a section taken substantially on line 4—4 of Fig. 1;

Figure 5 is an end view of the stud-operating member.

The device includes a body 1 provided at one end with a hexagonal socket 2 adapted to receive a nut A threaded on the upper end of a stud B, this stud being threaded into body C of an internal combustion engine and passing through an opening provided in flange D of head E of the engine, this being a well known form of construction in the internal combustion engine art.

Body 1 is further provided, at the inner end of socket 2, with a web 3 which is provided with a frusto-conical bore having a friction lining 4 of any suitable or preferred material. A stud-operating member 5 is mounted within body 1 and includes a frusto-conical head 6 adapted to fit tightly within the friction lining 4. A stem 7 extends from the inner end of head 6 and is threaded at its outer end portion to receive a nut 8 which is secured in position by a pin 9 inserted through the nut and stem 7, body 1 being provided with a suitably placed

opening 10 to permit insertion or removal of this pin. A washer 11 is confined between nut 8 and a shoulder on stem 7 provided by cutting away a portion of the stem to form a flattened surface 12, washer 11 being provided with a flattened portion 13 which contacts with surface 12 thus locking the washer against turning movement on stem 7. In its underface washer 13 is provided with a concentric groove 14 which extends approximately one-half of the circumference of the washer. This groove receives the upwardly turned end of a coil spring 15 confined between washer 11 and the inner end of web 3. The other end of spring 15 is turned downwardly to form, in effect, a pin which fits into a corresponding recess provided in the web. This spring and the parts associated therewith are mounted in a cylindrical bore 16 of the body, the outer portion 16^a of this bore being of polygonal or hexagonal shape to receive a plug 17, this plug being in the form of a collar provided with a squared opening 17^a for reception of a correspondingly shaped finger 18 formed integral with and disposed substantially at right angles to a bar 19 of suitable length. This provides simple and efficient means whereby great leverage may be obtained for turning body 1.

Head 6 is provided, in its outer end, with a squared socket 20. This socket is adapted to receive a squared plug 21 provided on its outer end with a blade 22 shaped to correspond to the ordinary blade of a screw-driver. The plug 21 is preferably, though not necessarily, secured in socket 20 by a pin 23 which passes through head 6 and fits into corresponding recesses or grooves in the plug and the adjacent wall of the body. Blade 22 is intended to fit into a groove provided in the end of stud B for this purpose, this groove being formed in any suitable or preferred manner.

In using the device, body 1 is placed over nut A, the nut fitting snugly into socket 2 and blade 22 fitting into the groove or slot provided in the end of stud B. After this has been done body 1 is turned by means of bar 19 and associated parts in such direction as to thread nut A off of stud B. Due to the provision of groove 14 in washer 11, body 1 can be turned through an arc of approximately 180° without affecting member 5. After body 1 has been turned through

approximately 180° the upper end of spring 15 will contact with the end wall of groove 14 so that continued turning of body 1 will expand or unwind spring 15 to a certain extent, this unwinding of the spring serving to extend the spring lengthwise thus raising washer 11 so as to force head 6 into tight contact with the friction lining 4 thus establishing a friction lock between web 3 and the head. In addition, as the spring 15 is unwound the coils or convolutions are expanded so as to contact with the wall of body 1, after which the spring serves to lock washer 11 to web 3. This provides a double-locking action by means of which member 5 is locked to the body for rotation therewith after body 1 has been turned a predetermined distance. By this arrangement nut A is first loosened on stud B, after which the nut and the stud are rotated together as a unit, upon further rotation of body 1, the stud and nut being simultaneously removed from the body C of the engine. After all of the studs have been thus removed the head can be readily removed so as to permit ready access to the interior of the cylinders for cleaning the same, the cleaning operation being facilitated by the absence of the studs or similar projecting members which would interfere with cleaning of the cylinders. After the cylinders have been cleaned, the head is replaced so as to bring the openings in flange D into alignment with the bores for reception of the studs in body C. The studs may then be inserted through the flange and threaded into body C by hand until the nuts A contact with the upper face of flange D. After this has been done, body 1 is again placed over nut A with blade 22 positioned in the slot of the stud and the body is rotated by means of bar 19 and associated parts in proper direction to thread the nut onto the stud. During the first part of this operation spring 15 holds head 6 of member 5 pressed tightly within friction lining 4 so as to be gripped or held thereby sufficiently to insure turning of stud B tightly into position. After the stud B is threaded tightly into position continued turning of body 1 serves to compress or wind up spring 15. This serves to, in effect, shorten spring 15 so as to release body 6 of member 5 from tight frictional contact with the friction lining 4 and also permits the upper end of the spring to pass out of groove 14 of washer 11. By this means member 5 is automatically released from body 1 after the stud B has been turned tightly into position thus permitting nut A to be turned onto the stud into tight contact with the upper face of flange D. As will be understood, the relative movement between stud B and nut A is comparatively slight in either case as it is only necessary, when removing the stud and

the nut, to turn the nut sufficiently to release it from pressure against flange D after which the stud and the nut are removed as a unit. In replacing the stud and the nut the nut would have to be turned onto the stud a sufficient distance only to bring the nut tightly and firmly against flange D, this distance corresponding to the distance which the nut was turned off of the stud when the stud and nut were removed.

I have illustrated and described a wrench as used in connection with a stud of a known type which has been provided in its upper end with a transverse groove or slot for reception of blade 22. By removing pin 23 and plug 21, the wrench can be used equally well in connection with a stud provided on its upper end with a squared extension adapted to fit into socket 20. As will be understood, and as above indicated, changes in construction and arrangement of parts of the invention may be resorted to without departing from the field and scope of the same, and I intend to include all such variations, as fall within the scope of the appended claims, in this application in which a preferred form only of my invention is disclosed.

What I claim is:—

1. In a wrench of the character described, a body provided in one end with a nut-receiving socket, a stud-engaging member carried by said body, and automatic means for connecting said member to the body for rotation therewith, said means permitting independent turning of the body in one direction through a predetermined distance when the stud-engaging member is in engagement with a stud and the body is in engagement with a nut threaded onto the stud, said means also permitting independent turning movement of the body in the other direction when the stud has been screwed into position.

2. In a wrench of the character described, a body provided in one end with a nut-receiving socket, a member carried by the body and adapted for engagement with a screw stud, said socket being adapted to fit about a nut threaded onto the stud, means for frictionally locking the stud-engaging member to the body for rotation therewith, said means permitting independent turning movement of the body a predetermined distance in one direction and thereafter establishing operating connections between the body and the stud-engaging member, said means also permitting independent turning movement of the body in the other direction after the stud has been screwed into position and acting to disconnect the stud-engaging member from the body.

3. In a wrench of the character described, a body provided at one end with a socket, a screwed stud-engaging member carried by

the body, said socket being disposed to fit about a nut threaded on a stud engaged by said member, the stud-engaging member including a head and a stem extending therefrom, means positioned to contact with the head of said member and to establish frictional driving connections between the body and said head, and means for normally forcing the head of the stud-engaging member into contact with the friction means and adapted to move said head out of contact with the friction means to permit independent turning of the body in one direction when the stud has been screwed into position, said means also acting to permit independent turning of the body through a predetermined distance in the other direction and to subsequently force the head of the stud-engaging member into tight contact with the friction means to establish driving connections between said member and the body.

4. In a wrench of the character described, a body provided in one end with a socket and with a web at the inner end of the socket, a stud-engaging member including a head positioned to contact with the web and a stem projecting beyond said web, the socket being positioned and adapted to en-

gage about a nut threaded on a stud with which the stud-engaging member is in engagement, a washer secured on said stem and held against relative rotary movement, said washer being provided in its inner face with a groove of predetermined length, and a coil spring mounted about the stem and confined between said web and the washer, one end of the spring fitting into said groove and the other end of the spring engaging into a recess provided in the web.

5. In a wrench of the character described, a body provided in one end with a socket and with an inner web at the inner end of said socket, said web being provided with a tapering bore, a stud-engaging member including a tapering head fitting into the bore of the web and a stem extending from said head, a washer secured on said stem and held against turning movement thereon, an expansion coil spring mounted about the stem and confined between the washer and the web, one end of said spring engaging into a recess provided in the web, said washer being provided in its inner face with a groove of predetermined length, the other end of the spring engaging into said groove.

In testimony whereof I affix my signature.

JOSEPH BARTOSIK.