

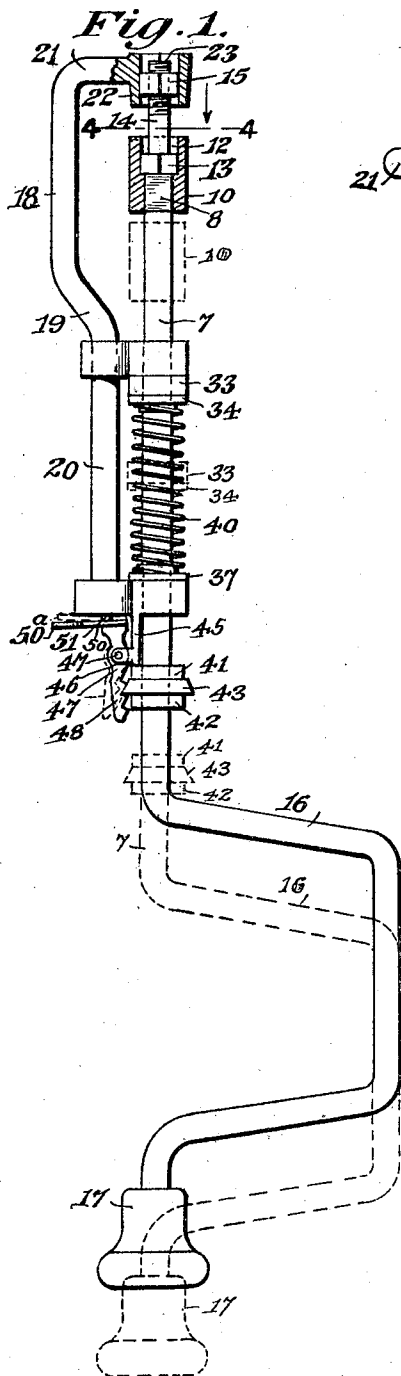
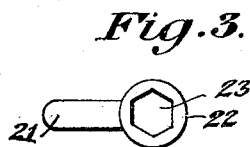
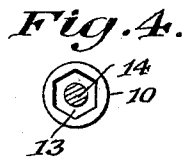
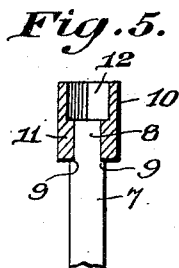
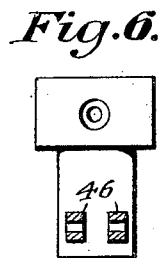
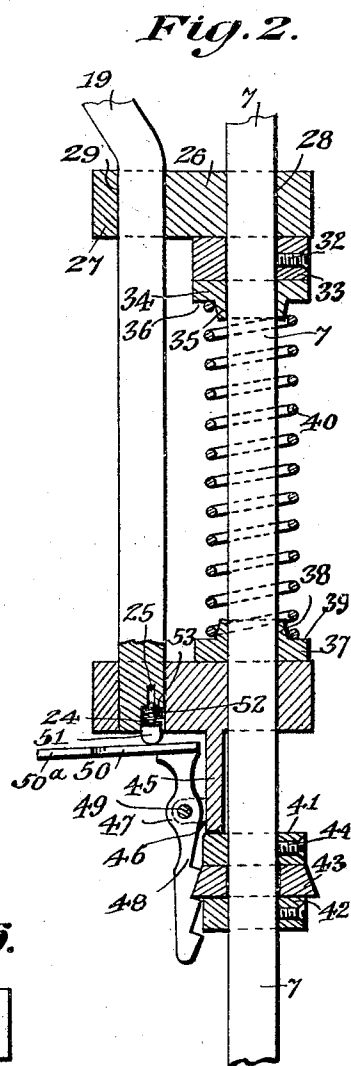
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E. R. SMITH ET AL

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WRENCH

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UNITED STATES PATENT OFFICE.

EDWIN R. SMITH AND JOHN A. CROSBY, OF WILLACOOCHIEE, GEORGIA.

WRENCH.

Application filed November 2, 1922. Serial No. 598,545.

To all whom it may concern:

Be it known that we, EDWIN R. SMITH and JOHN A. CROSBY, citizens of the United States, residing at Willacoochee, in the county of Atkinson and State of Georgia, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to wrenches, of the socket type, and is designed primarily for use in connection with the disassembling or assembling of machine and frame parts, especially the motor or driving parts of motor vehicles, as well as the frames of these latter, but it is to be understood however that a wrench in accordance with this invention can be employed for any purpose wherein it is found applicable, and the invention has for its object to provide a wrench of such class, in a manner as hereinafter referred to, for holding and quickly removing a nut from a bolt in a manner to overcome the necessity of one holding the head of the bolt, while another is removing the nut with a different tool, thereby attaining a saving in time, labor and expense and further expediting the disassembling and assembling of the machine and frame parts.

A further object of the invention is to provide a wrench for the purpose set forth and in a manner as hereinafter referred to, with a nut receiving socket element and means cooperating therewith for automatically locking it to prevent the turning of the nut by the element during the operation of separating the bolt from the nut.

A further object of the invention is to provide a wrench for the purpose set forth, and in a manner as hereinafter referred to, with a nut receiving socket element formed with a socket for the nut and with the socket open at each end whereby the socket is allowed to fit snugly down over the entire width of the nut, thus preventing the nut from slipping or turning in the socket and further overcoming the necessity of extracting the nut from the socket after it has been released, as the nut will be forced out of the top of the socket automatically when the wrench is positioned on another bolt.

A further object of the invention is to pro-

vide a wrench for the purpose set forth and in a manner as hereinafter referred to, with a nut receiving socket element and a holding spring cooperating therewith for maintaining said element in position with respect to the nut, and further providing the wrench with means associated with the holding spring to prevent the latter from tangling or twisting.

Further objects of the invention are to provide a wrench for the purpose set forth which is simple in its construction and arrangement, strong, durable, thoroughly efficient and convenient in its use, readily assembled and comparatively inexpensive.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is a side elevation, partly in section, of a wrench in accordance with this invention, and further showing the adaptation of the wrench with respect to a nut and a bolt and further illustrating the bolt engaging element of the wrench in full and dotted lines,

Figure 2 is a fragmentary view in vertical section,

Figure 3 is a top plan view of the nut receiving socket element,

Figure 4 is a section on line 4—4, Figure 1,

Figure 5 is a fragmentary view, partly in section, of the bolt receiving socket element,

Figure 6 is a fragmentary view illustrating the support for the nut receiving socket element and the locking device.

Referring to the drawings in detail, a wrench in accordance with this invention includes a bolt receiving socket element, a nut receiving socket element, a locking mechanism for the nut receiving socket element

and a handle member for the bolt receiving element.

- The bolt receiving socket element comprises an elongated shank 7, which is reduced at its forward end, as at 8, thereby providing a shoulder 9. Mounted on the reduced portion 8, of the shank 7, and also positioned against the shoulder 9, as well as being secured to said reduced portion 8, of the shank 7, in any suitable manner by welding or otherwise is a socket member 10, which is formed with an enlarged base 11 of a width equal to the length of the reduced portion 8, and the said member 10, above its base 11, provides a polygonal socket 12, for the reception of the head 13, of a bolt 14, the latter being threaded and engaging with the threaded portion is a nut 15.
- The lower end of the shank 7 terminates in a crank handle member 16, formed with a knob or base 17, in which the handle member 16 is swivelled or pivotally connected in a known manner.
- The nut receiving socket element comprises a stem 18, having the lower terminal portion thereof inwardly curved as at 19, and merging into the shank 20, the latter when the wrench is set up is disposed in parallelism with respect to the shank 1. The upper terminal portion of the stem 18 is disposed at right angles with respect to the intermediate portion of said stem 18, as indicated at 21, and the said upper terminal portion 21 terminates in a socket member 22, which provides a polygonal shaped socket 23, the latter being open at each end and which is positioned in alignment with the socket 12, and is adapted to receive and completely inclose the nut 15. The shank 20, at its inner end is formed with a pocket 24, with which communicates a passage 25, the latter constituting a guideway.
- The shanks 7 and 20, are permanently connected together and for this purpose a forward and a rear coupling member are employed and each of said coupling members consists of a rectangular plate 26, formed with a laterally curved extension 27. The plate 26, is provided with a pair of openings 28, 29. The coupling members are arranged in alignment and the openings 28 in said members are provided for the passage of the shank 7, which slides through said coupling members when occasion requires.
- The openings 29, of the coupling members are arranged in alignment and through the openings 29, extends the shank 20. The forward end of the shank 20, is fixedly secured to a circular extension 27, and the rear end of the shank 20 is fixedly secured to the circular extension of the rear coupling member.
- The rear end of the shank 20, is flush with

the rear face of the inner coupling member and the wall of the opening 28, in the inner coupling member forms a continuation of the wall of the pocket 24. Fixed to the shank 7, by the binding screw 32, is a collar 33, against which is positioned an annular member 34, provided with an inwardly directed cone-shaped extension 35, and which is of less diameter than the diameter of the member 34, thereby providing a seat 36. The shank 7 extends through the member 34, and the latter is arranged in abutting relation with respect to the collar 33. Positioned against the inner coupling member, that is against the forward face of said member is an annular member 37, provided with a forwardly directed cone-shaped extension 38, which is of less diameter than the member 37, thereby providing a seat 39. Surrounding the shank 7, and mounted against the seats 36, 39, as well as surrounding the cone-shaped extensions 35, 38, is a coiled holding spring 40, which is employed for the purpose of maintaining the nut receiving socket element in engagement with the nut. The cone-shaped extensions 35, 38, prevent the tangling or twisting of the coils of the spring when the latter is contracted. The spring 14, compresses toward the inner coupling member, due to the fact that when the shank 7 is shifted inwardly, the collar 33 and member 34, are carried therewith, as shown in dotted lines in Figure 1.

Fixed to the shank 7, rearwardly with respect to the inner coupling member is a pair of stationary collars 41, 42, and interposed between the collars 41 and 42, is a bevelled idler collar 43, which is of a diameter as to project laterally from the collars 41, 42. Securing elements 44, are provided to secure the collars 41, 42, to the shank 7.

Formed integral with and extending rearwardly from the inner coupling member, as well as opposing the shank 7, in close proximity thereto is a rearwardly directed arm 45, provided with a pair of lateral ears 46, between which is arranged a rearwardly directed locking bar 47, having one face thereof provided with a series of teeth 48, adapted to engage the collar 43. The bar 47 is pivotally connected to the ears 46, as at 49, and at its forward end is formed with a right angularly disposed arm 50, which is engaged by a spring controlled plunger head 51, the latter has a stem 52, projecting therefrom, and which extends through the pocket 24, and into the guide passage 26. Surrounding the stem 52, and interposed between the head 51, and the forward wall of the pocket 24, is a coiled spring 53, which normally projects the head 51, against the arm 50, so as to maintain one of the teeth of the bar 47 in engagement with the collar 43, as is shown in Figure 2. The arm 50 has a thumb piece 50^a.

When the wrench is used, the handle member is arranged inwardly and the sockets forwardly, in a manner as shown in Figure 1 of the drawings.

The locking mechanism is designed to lock the socket member 22, on the nut, but at the same time permits of shank 7 being operated by the handle member. By setting up the nut receiving socket element with respect to the bolt receiving socket element and arranging the locking mechanism in a manner as shown, the wrench can be employed in connection with crank cases and frames of various widths. It is obvious that the socket forming members 10 and 22, can receive reducers to provide for the employment of the wrench in connection with nuts and bolt heads of different sizes.

The holding spring 40, is further employed for maintaining the position of the socket member 10 with respect to the head of the bolt being removed, during the operation of the backing off the nut and as before stated the spring 40, also performs the function, in connection with the locking mechanism, of maintaining the nut receiving socket element in operative position with respect to the nut which is to be removed from the bolt.

From the foregoing description taken in connection with the accompanying drawings, a construction of wrench is set up which provides an efficient and convenient means for backing off a nut from a bolt, and although the drawings illustrate the preferred embodiment of the invention, yet it is to be understood that changes in the detail of construction can be had without departing from the spirit of the invention as claimed.

What we claim is:—

1. A wrench comprising a nut holding element provided with a nut receiving socket open at each end, a lengthwise shiftable and rotatable bolt removing element provided with a bolt head receiving socket opposing the nut receiving socket, means for locking said nut receiving element with the bolt removing element whereby movement of the former is arrested during the operation of the bolt removing element, an inner and an outer coupling member for connecting said elements together, said inner member carrying said locking means for said element, a resilient element surrounding said bolt removing element and confined by said member, and a shiftable and a stationary annular member mounted on said bolt removing element and interposed between said coupling members and provided with conical extensions projecting into said resilient elements.

2. A wrench comprising a nut holding element provided with a right angularly disposed forward terminal portion formed with a nut receiving socket open at each end,

a rotatable and lengthwise shiftable bolt removing element having its forward end provided with a bolt receiving socket opposing the nut receiving socket, laterally disposed inner and outer coupling members carried by the bolt removing element for connecting the nut holding element therewith, a resilient element carried by the bolt removing element and interposed between said members, a bevelled collar connected to said bolt removing element rearwardly with respect to said inner coupling member, and a spring controlled toothed locking means pivotally supported from said inner coupling member and engaging with said bevelled collar for locking said nut receiving and bolt removing elements from lengthwise shifting relative to each other.

3. A wrench comprising a lengthwise shiftable and rotatable bolt-removing element, a nut holding element, an inner and an outer coupling member loosely mounted on said bolt removing element, said coupling members laterally disposed with respect to said bolt-removing element and coupling said nut holding element therewith, a bevelled collar connected to said bolt removing element inwardly with respect to said inner coupling member, and an angle-shaped spring-controlled toothed locking means pivotally supported from said inner coupling member and engageable with said collar to prevent lengthwise shifting of the nut receiving element with respect to the bolt removing element.

4. A wrench comprising a lengthwise shiftable and rotatable bolt removing element, a nut holding element, an inner and an outer coupling member loosely mounted on said bolt removing element, said coupling members laterally disposed with respect to said bolt removing element and coupling said nut holding element therewith, a bevelled collar connected to said bolt removing element inwardly with respect to said inner coupling member, an angle-shaped spring controlled toothed locking means pivotally supported from said inner coupling member and engageable with said collar to prevent lengthwise shifting of the nut receiving element with respect to the bolt removing element, and a coiled spring mounted on said bolt removing element and interposed between said coupling members.

5. A wrench comprising a nut receiving and a bolt removing element, a pair of spaced coupling members shiftable on said bolt removing element and acting as means for coupling the nut receiving element therewith, a coiled spring mounted on the bolt removing element and interposed between said coupling members, a bevelled collar carried by the bolt removing element, means to prevent said collar shifting lengthwise on

said bolt removing element, an arm extended from one of said coupling members and engaging with said means for arresting movement in one direction of said coupling members, and a spring controlled toothed locking element pivotally supported from said arm and engaging with said collar to arrest lengthwise shifting of the nut receiving element with respect to the bolt removing element.

In testimony whereof, we affix our signatures hereto.

EDWIN R. SMITH.
JOHN A. CROSBY.