

A. C. SMITH.
WRENCH.

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903,904.

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Fig. 1.

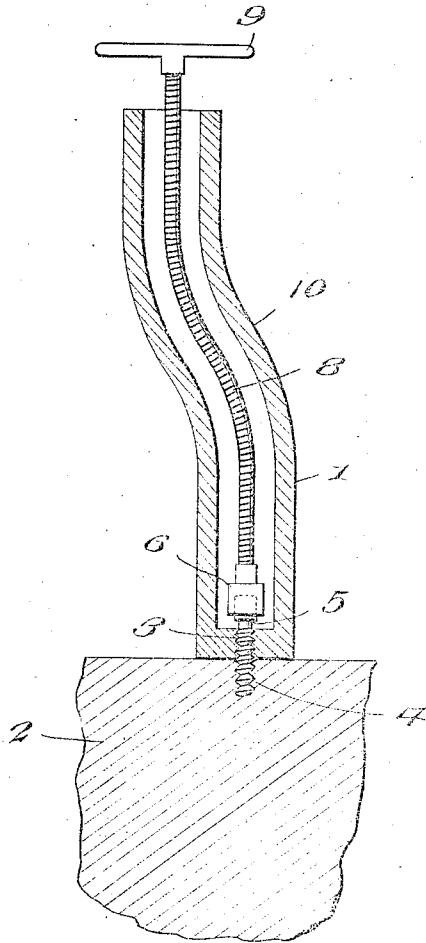


Fig. 2.

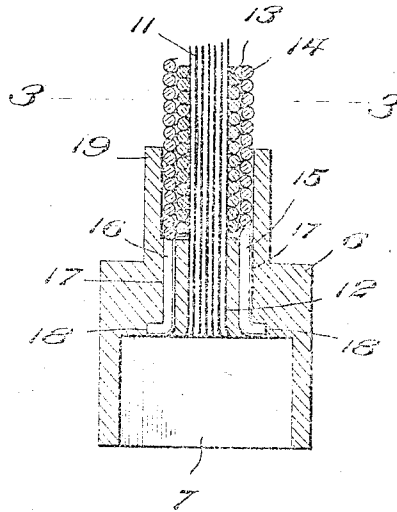
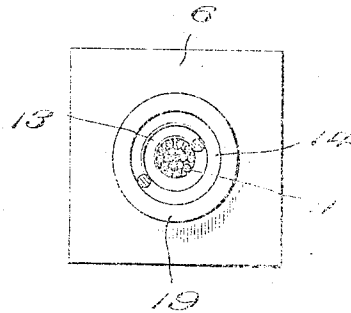


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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WRENCH.

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To all whom it may concern:

Be it known that I, ALFRED CARLETON SMITH, a citizen of the United States, residing at Dobbs Ferry, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in wrenches, and more particularly to that class known as socket wrenches and my object is to provide a wrench of this class which may be introduced into a tubular member and engaged with the head of a bolt or screw.

A further object is to provide a flexible handle for the socket of the wrench, whereby the wrench may be introduced into a pipe having curvatures in its length and, at the same time, permit the wrench to operate.

A further object is to provide means for securing the handle to the socket.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings which are made a part of this application, Figure 1 is a sectional view through a tubular member and the object to which the same is secured, showing the wrench applied to use. Fig. 2 is a detail, sectional view of the lower end of the wrench on an enlarged scale, and, Fig. 3 is a sectional view as seen on line 3-3, Fig. 1.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates a tubular member and 2 an object to which the same is to be secured, the lower end of the tubular member being closed and provided with a threaded bore 3, through which takes a bolt or screw 4, said screw being exteriorly threaded to engage the threads in the bore. The upper end of the bolt 4 is provided with a head 5, which is preferably square in cross section, with which is adapted to engage a body portion 6 of a wrench, said body portion having a socket 7 therein to receive the head 5, and to the body portion 6 is secured a handle 8, by which means the body portion is introduced into the open end of the tubular member 1 and the socket

directed into engagement with the head 5, the extreme upper end of the handle being provided with a cross bar 9, whereby the body portion may be turned and the bolt entered into or removed from the object 2.

The tubular member 1 is provided with a curvature 10 at a point in its length, thereby disposing the lower end of the tubular member out of alinement with the upper end thereof, and, when objects of this class are encountered, it is necessary to provide a flexible handle, so that the body portion may be directed out of alinement with the cross bar and, at the same time, provide a sufficiently rigid handle to cause the body portion to turn the bolt, when the cross bar is rotated. To this end, I provide a plurality of strands 11, preferably of wire, which are secured at their lower end to the body 6 by disposing the lower ends of the strands through an opening 12 in the head, while the upper ends of the strands are secured in any preferred manner to the cross bar 9.

Surrounding the strands 11 are spirally disposed coverings 13 and 14, the inner covering 13 being oppositely wound to the outer covering 14, whereby the tension of one of the coverings will be opposed to the tension of the oppositely wound covering, when the handle is turned in opposite directions.

The lower ends of the coverings 13 and 14 are provided with extensions 15 and 16, respectively, which extensions extend downwardly through ways 17 in the body 6, the lower ends of the extensions 15 and 16 being bent at right angles to the extensions and seated in notches 18, thereby positively securing the coverings to the body 6.

The opposite ends of the coverings are secured to the cross bar 9 in any suitable manner, while the body 6 is provided with an upwardly extending thimble 19, into which the lower ends of the coverings are inserted.

The coverings 13 and 14 are preferably formed of spring metal and closely coiled around the strands 11, the coils thereof being directed in opposite directions to provide sufficient rigidity to the handle to operate the bolt as described.

By this construction of wrench, it will be seen that the bolts may be readily operated where a wrench having a rigid handle could not be employed and, by constructing the handle in the manner shown, it will be readily seen that the same may be bent at

various angles or curvatures by opposing the tension of the two coverings for the handle, the bolt will be positively rotated in either direction when the cross bar is turned.

5 What I claim is:

1. In a wrench of the class described, the combination with a body portion having a socket therein and an opening through the body portion; of strands secured in said
10 opening and extending upwardly therefrom, a cross bar at the upper ends of said strands and means surrounding said strands to limit the relative twisting of the strands between the body and cross bar in either direction
15 when the cross bar is rotated.

2. In a wrench of the class described, the combination with a body portion having a socket therein and an opening through the body portion; of strands secured in said
20 opening and extending upwardly from the body, a cross bar at the upper end of said strands and an inner and outer covering for said strands adapted to limit the relative twisting of the strands between the body and
25 cross bar in either direction when the cross bar is turned.

3. In a wrench of the class described, the combination with a body portion having an opening therethrough; of strands secured in
30 said opening and extending upwardly therefrom, a cross bar at the upper end of said strands and flexible coverings surrounding

said strands and secured at their ends, respectively, to the body portion and cross bar.

4. In a wrench of the class described, the combination with a body portion; of strands
35 secured to said body portion, means at the upper ends of the strands to impart rotating movement thereto, spirally disposed flexible coverings surrounding said strands and
40 means to secure the coverings to the body portion.

5. In a wrench of the class described, the combination with a body; of strands secured to said body, an inner and outer covering
45 surrounding said strands, said coverings being spirally disposed and having their tension opposed to each other and means to secure the coverings to the body.

6. In a wrench of the class described, the combination with a body portion having a
50 socket, strands secured to said body and a cross bar at the upper ends of said strands; of means to limit the relative twisting of the strands between the body and cross bar when
55 said body and cross bar are rotated.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED CARLETON SMITH.

Witnesses:

BYRON OTOOLE,
Mrs. A. C. SMITH.