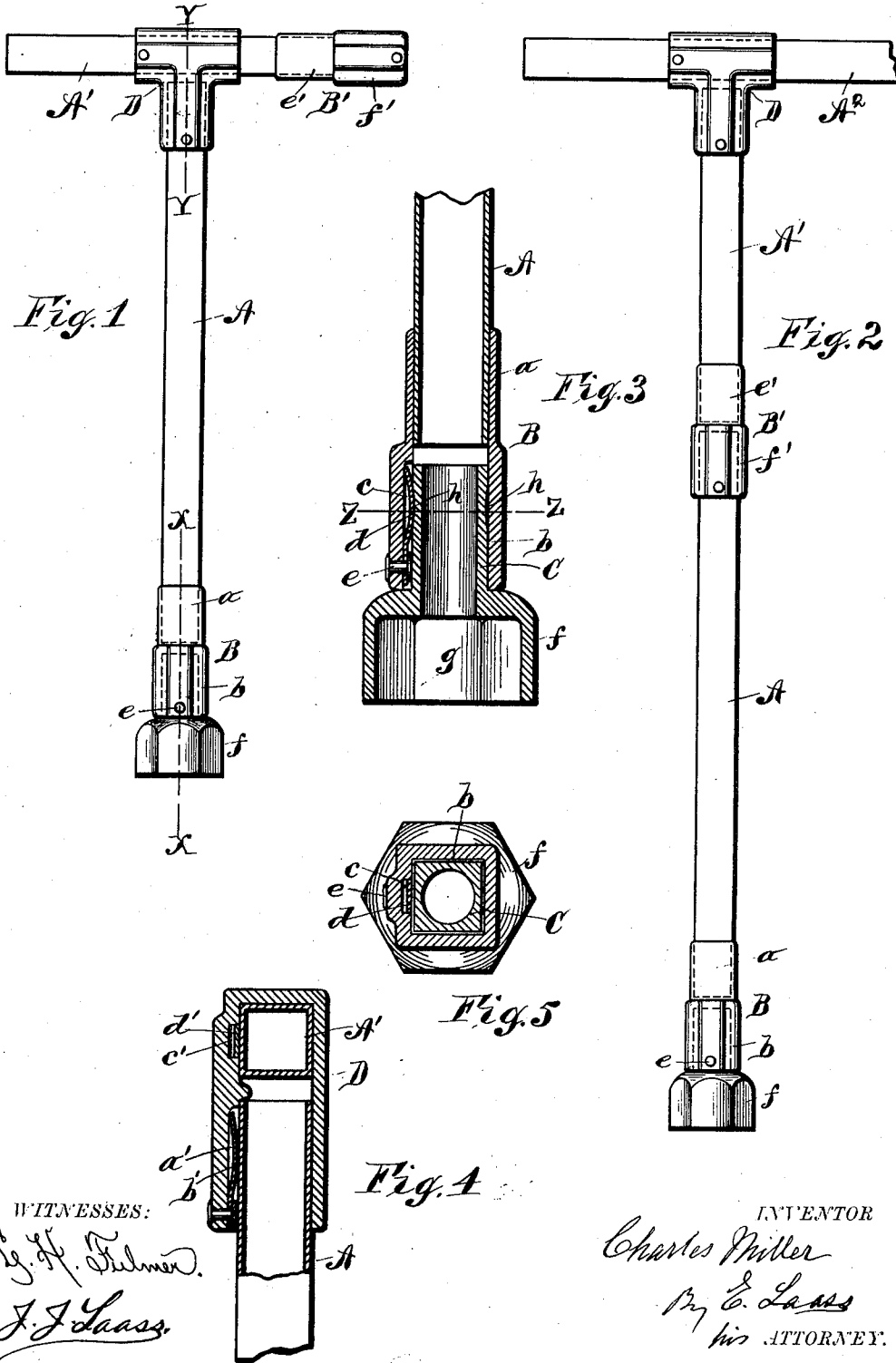


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SOCKET WRENCH.

APPLICATION FILED DEC. 7, 1905.



WITNESSES:

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SOCKET-WRENCH.

No. 845,717.

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To all whom it may concern:

Be it known that I, CHARLES MILLER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Socket-Wrenches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of wrenches which are composed of a main bar provided at one end with a socket for engagement with either a nut or a head of a bolt and provided at the opposite end with a transverse bar serving as a handle for turning the same and which are commonly known as "T-socket wrenches."

The main object of the present invention is to provide a wrench of the above type with a nut socket member which can be readily removed and attached to the bar, so as to permit the use of various-sized sockets, and thereby rendering the wrench applicable to different nuts or bolt-heads.

Another object of the invention is to provide a wrench composed of parts having interchangeable connections, so as to enable the wrench to be conveniently lengthened or shortened to accommodate itself to various conditions which may arise as to the location of a nut required to be turned.

Furthermore, an object of this invention is to produce a wrench of the aforesaid character which shall be simple, strong, and durable in its construction and shall be very light in weight and at the same time inexpensive to manufacture.

Other objects of the invention will be apparent by the novel combination and arrangement of the component parts of the T-socket wrench hereinafter fully described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a side view of a socket-wrench embodying my invention. Fig. 2 is also a side view showing the wrench extended by the interchanging of parts. Figs. 3 and 4 are enlarged longitudinal sections on the dotted lines X X and Y Y, respectively, in Fig. 1; and Fig. 5 is a transverse section on the dotted line Z Z in Fig. 3.

Similar letters of reference indicate corresponding parts.

A denotes the main bar of the wrench, which is composed of a steel tube preferably formed square in cross-section, to one end of which bar is permanently secured a coupling B, consisting of a cast-metal sleeve *a*, embracing the bar and formed correspondingly in cross-section and which extends beyond the end of the bar and preferably enlarged to form a socket *b*. In one of the walls of this socket *b* is formed a longitudinal channel *c*, in which is fitted a plate *d*, preferably secured therein by means of a rivet *e*, passing through the said wall and outer end portion of the plate. This plate has its main portion deflected from the channel, so as to produce a spring, as shown in Fig. 3 of the drawings.

C denotes a stem which is inserted into the socket *b* and shaped correspondingly in cross-section to prevent the said stem from turning therein and which is formed on its outer end with a head *f*, abutting against the end of the coupling and provided with a nut-socket *g*. This stem extends substantially the entire depth of the socket and is completely embraced thereby, and it is securely retained therein by frictional engagement with the aforesaid spring-plate *d*, whereby it can be readily removed when required. I prefer to form the said stem hollow in order to reduce its weight, and thus less friction is required to sustain the same. To cause the spring-plate *d* to obtain a more secure hold on the stem, the latter may be provided with a recess *h*, disposed to be engaged by the curved portion of the plate, as illustrated in Fig. 3 of the drawings. By providing each of the sides of the square stem with a recess it is obvious that the stem may be inserted into the socket *b* with any side presented to the spring-plate *d*.

I propose to provide a set of stems adapted to be interchangeably inserted into the socket *b* of the bar and make the sockets of these stems in various sizes to accommodate the wrench to different standard-sized nuts. It is obvious that each stem may be provided with a friction-plate *d*. However, such plan has been found undesirable in practice, not only by the increased cost of manufacture, but by reason of the liability of the springs being bent or broken off from the stems when the latter are not in use, caused by the

said plates becoming caught on some object or falling of the stems upon a hard surface incident to rough and careless handling of the same, particularly during transportation.

The outer end of the bar A is provided with a T-coupling D, preferably composed of cast metal and provided with an interior longitudinal channel a' , in which is secured a spring-plate b' , frictionally engaging the bar and retaining the same in the coupling. The longitudinal and transverse portions of this T-coupling are formed correspondingly square in cross-section, and in said transverse portion is provided a channel c' , in which is secured a spring-plate d' .

A' denotes a supplemental bar which is also composed of a steel tube and formed square in cross-section correspondingly with the bar A and T-coupling. Said bar A' is generally inserted through the transverse portion of the T-coupling to serve as a cross-bar or handle for turning the wrench. One end of the bar A' is provided with a coupling B', preferably composed of cast metal and consisting of a sleeve e' , embracing the bar and extending beyond the end of the bar and enlarged at the extended portion to form a socket f' , which is square in cross-section correspondingly with the coupling D and aforesaid socket b . Said socket f' is also formed with a longitudinal interior channel which is provided with a spring-plate. Inasmuch as this channel and spring-plate are identical with those of the couplings D and B, they do not require illustration. By this described construction it is obvious that the T-coupling D and coupling B' are adapted to be interchangeably connected to the bars A and A', whereby the outer end of the bar A may be inserted into the socket f' of the bar A' for the purpose of lengthening the wrench when required. When the wrench is thus extended, the T-coupling D is applied to the plain end of the bar A', in which instance I provide an additional bar A², which is inserted through the transverse portion of the said coupling to serve as a cross-bar or handle, as shown in Fig. 2 of the drawings. It will be understood that any convenient number of these sections or bars may be employed, so as to permit the wrench to be extended as may be required. It is obvious that the stem C of the nut-socket can be inserted into the socket of the shorter bar A', if desired, in which case the T-coupling would be applied to the bar and the main bar inserted through the said T-coupling to serve as a handle. It will be observed that the interiors of the T-coupling and the aforesaid socket b are of corresponding dimensions, whereby the stem C may be applied to the said T-coupling to produce a very

short wrench when required. While I prefer to form these bars of steel tubes and form the couplings of cast metal, at the same time it will be understood that the said bars may be composed of castings and their couplings formed integral therewith. However, by forming the parts hollow, as shown, the wrench is rendered very light in weight. At the same time it possesses requisite strength. This lightness in conjunction with the interchangeability of the parts renders the wrench very convenient for transportation.

What I claim as my invention is—

1. A wrench of the class specified comprising a bar provided at one end with a detachable stem formed with a nut-socket, a T-coupling provided with a longitudinally-disposed spring-plate by which the bar is frictionally held in said coupling, and provided with a transversely-disposed spring-plate, and a cross-bar inserted through said coupling and sustained therein by frictional engagement with the latter spring-plate as set forth.

2. A wrench of the class specified comprising a main bar provided at one end with a detachable nut socket member, a detachable T-coupling on the opposite end of the bar, a cross-bar inserted removably in said coupling, and friction-plates retaining the two bars in their connections, said bars being interchangeable in relation to the said coupling as set forth.

3. An extensible socket-wrench comprising a main bar provided at one end with a socket having a spring-plate therein, a stem inserted in said socket and sustained removably by frictional engagement with the spring-plate and formed with a nut-socket, a T-coupling provided with like friction-plates and detachably applied to the opposite end of the bar, a cross-bar inserted removably through the T-coupling and provided at one end with a socket having a friction-plate, said cross-bar being adapted to be connected to the main bar interchangeably with said coupling, and the latter adapted to be applied to the cross-bar as set forth and shown.

4. An extensible socket-wrench comprising a bar provided at one end with a socket, a stem supported removably in said socket and provided with a nut-socket, a hollow T-shaped member into which the opposite end of the bar is removably inserted, said bar-socket and T-shaped member being of corresponding dimensions in cross-section to permit the bar and stem to be interchangeably applied to said T-shaped member as set forth.

5. An extensible socket-wrench comprising a main bar provided at one end with a longitudinal socket and having its opposite end plain, a T-coupling, a supplemental bar

provided at one end with a longitudinal socket corresponding with the socket of the main bar, said bars being formed correspondingly angular in cross-section to render the same interchangeable in their connections with the T-coupling, and a stem formed with a nut-socket and adapted to be interchange-

ably applied to the sockets of the bars and T-coupling as set forth.

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Witnesses:

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