

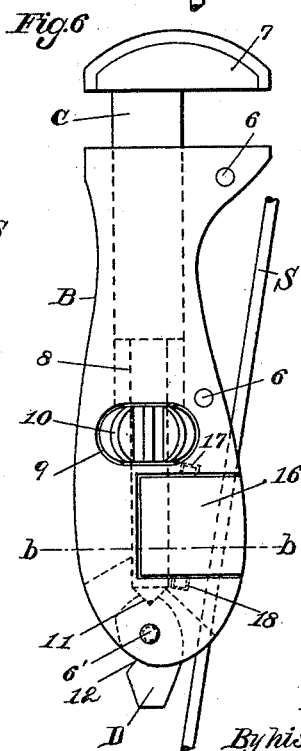
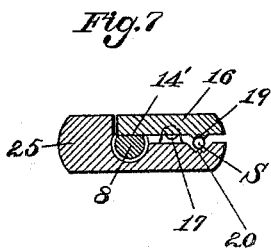
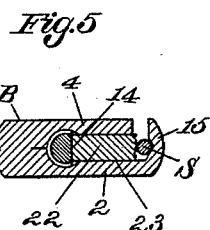
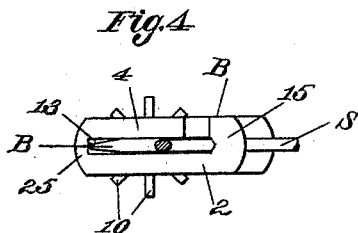
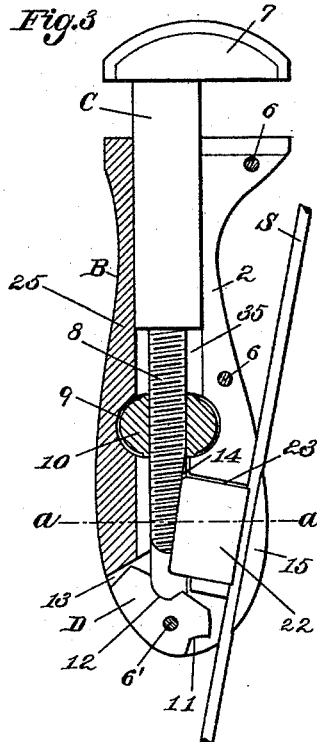
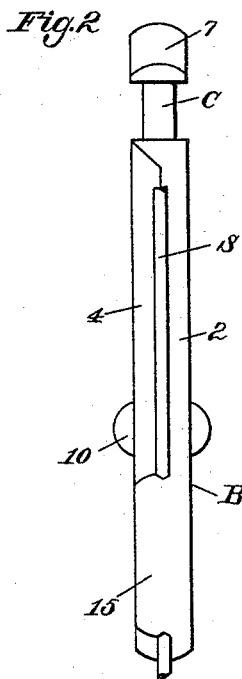
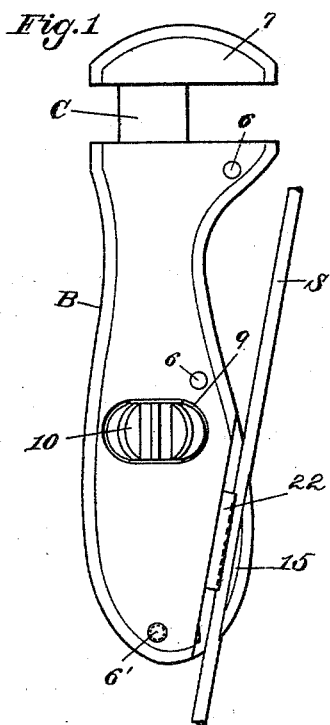
(No Model.)

2 Sheets—Sheet 1.

E. L. SHULTZ.
WRENCH.

No. 491,606.

Patented Feb. 14, 1893.



Witnesses:

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H. Malmer.

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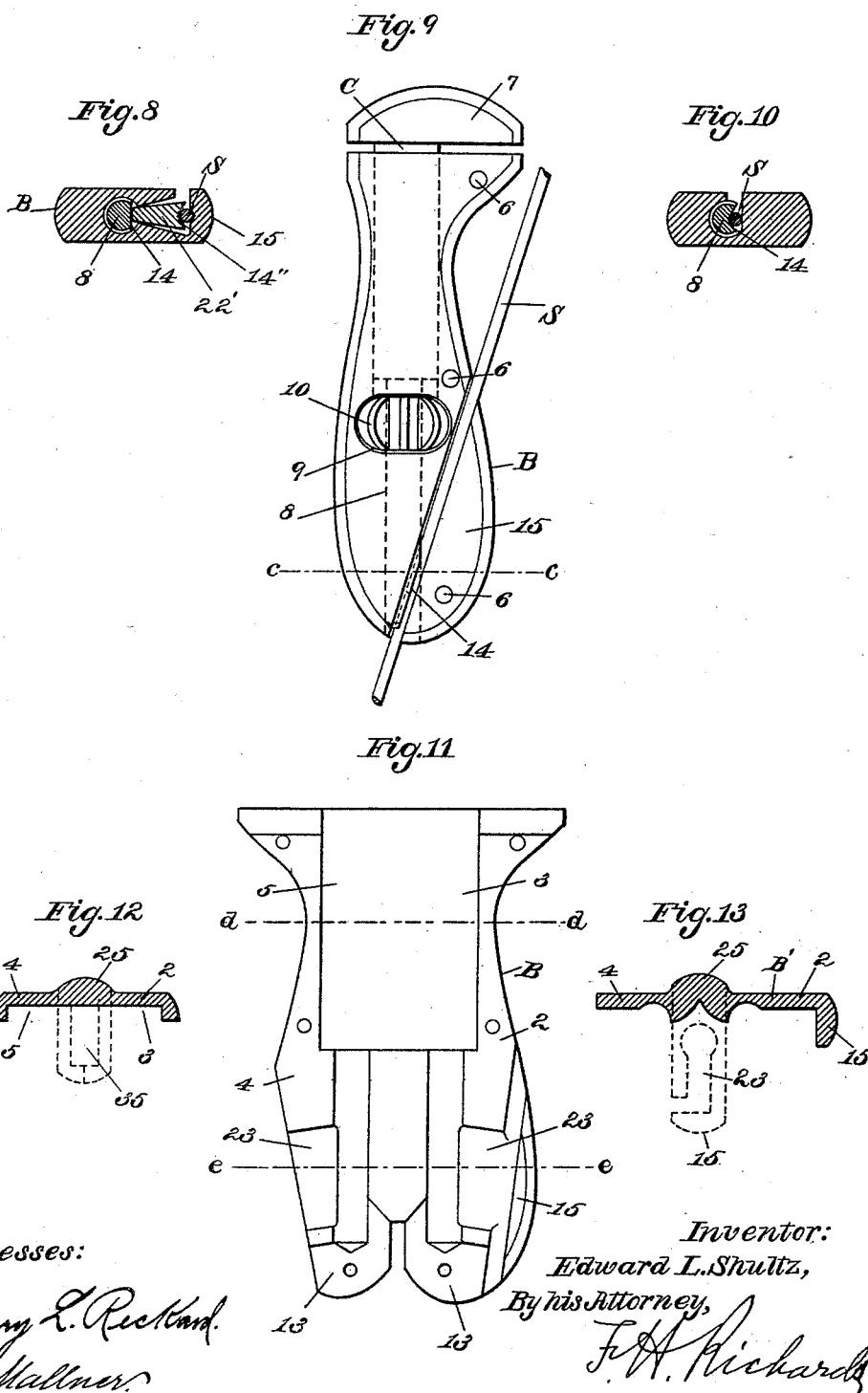
(No Model.)

2 Sheets—Sheet 2.

E. L. SHULTZ.
WRENCH.

No. 491,606.

Patented Feb. 14, 1893.



UNITED STATES PATENT OFFICE.

EDWARD L. SHULTZ, OF HARTFORD, CONNECTICUT.

WRENCH.

SPECIFICATION forming part of Letters Patent No. 491,606, dated February 14, 1893.

Application filed April 26, 1892. Serial No. 430,747. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. SHULTZ, a citizen of Warsaw, Poland, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to that class of wrenches in which the wrench-bar slides within the handle or handle-bar of the wrench; the object being to provide a wrench of that class having auxiliary implements, or devices, co-acting with the principal movable part of the wrench.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side view of a wrench embodying my present improvements. Fig. 2 is an edge view of the wrench, as seen from the right-hand in Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the handle, or frame, of the wrench broken away to show the operative details. Fig. 4 is an end view of the wrench, drawn in projection with Fig. 1. Fig. 5 is a sectional view, in line *a a*, Fig. 3. Fig. 6 is a view similar to Fig. 1, illustrating a modification of the spoke-grip portion of the wrench. Fig. 7 is a sectional view, in line *b b*, Fig. 6, and illustrates the operation of said modification. Fig. 8 is a sectional view similar to Fig. 5, showing an improvement in the construction of the spoke-grip device comprised in the wrench shown in Figs. 1 to 5, inclusive. Fig. 9 is a view illustrating a further modification in the construction of the spoke-grip device. Fig. 10 is a sectional view, in line *c c* of Fig. 9. Fig. 11 is a plan view of the blank used in the construction of the handle of the wrench. Fig. 12 is a sectional view of said handle-blank, in line *d d*, Fig. 11. Fig. 13 is a similar view, in line *e e* of Fig. 11.

Similar characters designate like parts in all the figures.

My improved wrench generally speaking comprises the following elements, to wit: the handle, the wrench-bar carrying a movable wrench-jaw, the nut for actuating the wrench-bar, a spoke-grip device co-acting with the wrench-bar and constituting an auxiliary wrench for a special purpose, and also, in some cases, a tool-blade carried in the wrench-handle and held in place, either open or closed, by engagement with the wrench-bar.

The wrench-handle B may be of any suitable construction adapted to receive the operative parts of the wrench, but I prefer to use a handle of the improved construction shown in Figs. 11, 12 and 13. This improved handle is constructed of a handle-blank, B', having the two sides 2 and 4 joined by the back-portion 25, each side containing spaces, 3 and 5, respectively, forming, when the handle is completed, a suitable space within and longitudinally of the handle for receiving the sliding wrench-bar C, Fig. 3. When the handle-sides 2 and 4 are closed together as shown in dotted lines in Fig. 13, the two sides thereof are held together by suitable rivets, as for instance, the rivets 6, Fig. 3. One of said rivets, 6', Fig. 3, is shown forming a pivot on which is supported the movable tool-blade D. This blade, which in the present instance is a screw-driver blade, is shown in said Fig. 3 in its closed position, and in Fig. 6 in its opened position ready for use. Said blade D, instead of being constructed at its outer end to be used for a screw-driver, may be constructed to form a hook, a boring-tool, or some other implement.

The wrench-bar consists of the bar C carrying the movable wrench-jaw 7, and fitted slide within the space 35, Fig. 12, within the handle of the wrench. The inner end, 8, of the wrench-bar is threaded to receive the nut 10, which lies in the space 9 of the wrench-handle, and operates, in a well-known manner, for sliding the wrench-bar longitudinally within the handle. The extreme end of said threaded portion of the wrench-bar is shown constructed to constitute a locking-device for engaging in the notches 11 and 12, respectively, of the tool-blade D, which, as hereinbefore described, is pivotally supported on the pin 6', within the slot 13 in the end of the handle B of the wrench. On one side the wrench-bar, is beveled, or inclined, as at 14, Figs. 3 and 5, or at 14', Fig. 7, for co-acting (either directly or through a movable jaw) with the fixed spoke-grip-jaw 15 formed on, and constituting a part of, the wrench-handle. In the modification shown in Figs. 9, and 10 (the tool-blade D being here omitted), said inclined face 14 of the wrench-bar constitutes the movable jaw or face of the spoke-grip device, as will be understood by comparison of Figs. 9 and 10. In the modification shown in Figs.

6 and 7, the inclined face 14' of the wrench-bar operates against the underside of the inner edge of a pivotally-supported spoke-grip-jaw, 16, that is pivoted at 17 and 18 in the wrench-handle, and has a grip-face, 19, co-acting with the opposite grip-face 20 formed in the wrench-handle, as will be understood by comparison of said Figs. 6 and 7.

In the preferred form of the wrench shown in Figs. 1 to 5, inclusive, the inclined face 14 of the wrench-bar bears against and actuates the movable spoke-grip-jaw 22 which is contained within the space 23 of the wrench-handle and co-acts with the fixed jaw 15, as will be understood by comparison of Figs. 1, 3, and 5, in which the spoke (of a bicycle-wheel) is designated by S.

The construction of the spoke-grip-wrench shown in Fig. 8 is an improvement upon that shown in Fig. 5. This improvement consists in constructing the movable jaw 22' (corresponding to the movable jaw 22 of the preceding figures) to have a movement laterally at the end thereof which engages the spoke S; and constructing the face 14'' of said jaw 22' slightly concave or beveled, substantially as indicated in said Fig. 8. On using this form of spoke-grip-wrench, when a torsional strain is applied thereto, the tendency of the spoke to roll between the jaws 14'' and 15 causes a slight lateral or rocking movement of said jaw, which, owing to its concave face described, operates after the manner of certain well-known kinds of pipe-wrenches to close upon the said spoke with an increasing pressure proportionate to the power applied to the wrench. By this means the spoke is grasped with great force, notwithstanding that the movable jaw may at first be only lightly closed against the spoke by the wedge-face on the rod 8.

It will be particularly noted, that by arranging the spoke gripping jaws at an acute angle to the length of the wrench bar and handle not only are the advantages of a powerful grip as just pointed out secured, but the head of the wrench will lie so close to the spoke being operated upon, that it will pass between adjacent spokes whereby any spoke may be completely adjusted without the necessity of loosening and again tightening the wrench, a result which could not be accomplished if the jaws crossed the wrench at right angles to its longitudinal center.

Having thus described my invention, I claim—

1. In a wrench, such as described, the combination with the handle, the longitudinally movable wrench bar carried thereby and the co-operating nut clamping jaws at one end thereof, of the spoke gripping jaws at the opposite end having gripping faces inclined at an acute angle to the longitudinal center of the handle and adapted to be closed by the rearward movement of the wrench bar, whereby the body of the wrench lies close to the

spoke when gripped thereon to facilitate its passage between adjacent spokes; substantially as described.

2. In a wrench, such as described, the combination with the handle, the longitudinally movable wrench bar carried thereby and having the rear end wedge shape, the co-operating nut clamping jaws at one end of said bar and handle and the stationary spoke gripping jaw at the opposite end of the handle, of the movable spoke gripping jaw carried by the handle and co-operating with the wedge shape end of the wrench bar whereby it is closed against the stationary spoke gripping jaw; substantially as described.

3. In a wrench of the class specified, the combination with the movable jaw having the stem 8 inclined on one side thereof as set forth, of the handle having the grip-jaw face at one side of said stem and substantially longitudinal with said inclined face, and a jaw intermediate to said inclined face and handle-jaw and adapted to be actuated by the stem for gripping the spoke, substantially as shown and described.

4. In a wrench of the class specified, the combination with the wrench-handle having the fixed spoke-grip-jaw, and with the wrench-bar sliding in the handle and having a wedge substantially as described, of the rocking spoke-grip-jaw seated against said wedge and having its spoke-engaging edge movable laterally of the fixed jaw, substantially as set forth.

5. In a wrench of the class specified, the combination with the handle having the slot 13, of the blade D pivoted in said slot and having the detent-notches, and the wrench-bar having the projecting end fitted to engage in said blade-notches when the wrench-bar is closed, substantially as described.

6. In a wrench of the class specified, the combination with a handle having the grip-jaw 15, of the sliding stem 8 having an inclined face as set forth, and the movable jaw 22' having a concave grip-face co-acting with the said grip-jaw, the face-side of said movable jaw being adapted to have movement laterally of its closing movement, substantially as and for the purpose described.

7. The improved wrench-bar-blank herein shown and described for wrenches of the class specified, consisting in the two side-plates 2 and 4 joined at their edges by the back-forming portion 25, and having therein, respectively, the wrench-bar grooves 3 and 5, and one of the sides having thereon the grip-jaw 15, said handle-blank being adapted to be closed upon itself to form the handle of the wrench and having therein the wrench-bar space, the nut-space, and the spoke-grip-jaw-space, substantially as set forth.

EDWARD L. SHULTZ.

Witnesses:

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