Dec. 30, 1924. 1,520,834

G. E. MALONE

MULTIFORM TOOL

Filed Aug. 9, 1923

Fig. 1.

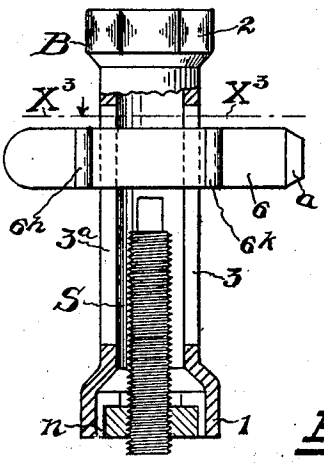


Fig. 2.

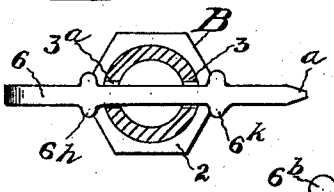


Fig. 5.

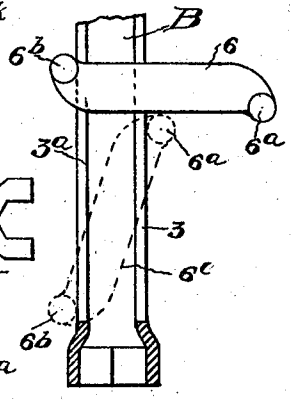


Fig. 3.

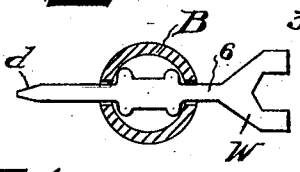


Fig. 4.

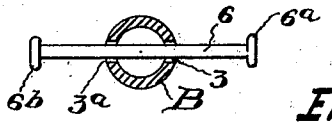


Fig. 6.

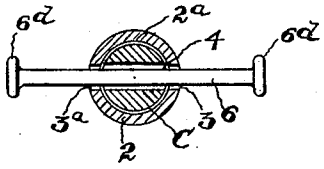


Fig. 9.

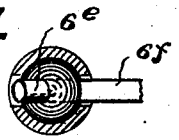


Fig. 8.

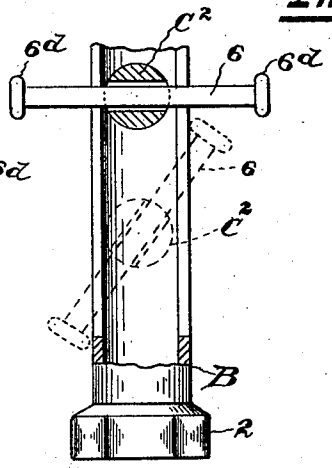


Fig. 10.

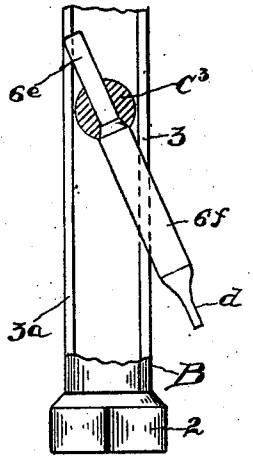
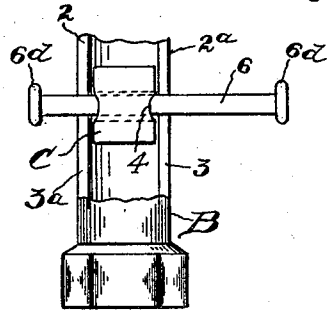


Fig. 7.



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UNITED STATES PATENT OFFICE.

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MULTIFORM TOOL.

Application filed August 9, 1923. Serial No. 656,577.

To all whom it may concern:

Be it known that I, GEORGE E. MALONE, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Multiform Tools, of which the following is a specification.

This invention relates to multiform implements, and more especially to that class thereof in which the implement, or compound tool, comprises a plurality of tool-ends adapted for similar uses but having different sizes. My present improvements are particularly applicable to said tools when one member thereof is provided with a pair of socket-form wrench-ends of different sizes, respectively, and when these form the opposite ends, respectively, of a tubular body-member. Accordingly, for illustrating my invention, a compound tool of this character, and provided with such a pair of socket wrench-ends, is shown in the accompanying drawings, in which—

Fig. 1 is a side elevation of the implement, one side being shown partially broken away.

Fig. 2 is an end view, showing the implement as seen from above in Fig. 1.

Fig. 3 is a section in line X^3, X^3, Fig. 1, showing the parts below said line as seen from a point above said line.

Fig. 4 is a section similar to the section of Fig. 3 showing a modification;

Fig. 5 is a fragmental side elevation similar to the elevation shown in Fig. 1 of another modification;

Fig. 6 is a section also similar to the section of Fig. 3 showing still another modification;

Fig. 7 is a fragmental side elevation of the implement shown in Fig. 6 with one side partially broken away;

Fig. 8 is a fragmental side elevation similar to the elevation of Fig. 7 showing a modified form of the carrier;

Fig. 9 is a section similar to the section of Fig. 6 showing another form of wrench handle; and

Fig. 10 is a fragmental side elevation of the modification shown in Fig. 9.

Similar characters designate like parts in all the views.

In Fig. 1, the body member B has a hollow interior, and is provided with wrench-ends 1 and 2. The member B has through opposite side walls of the member the longitudinal slots 3, 3^a, extending (about as shown) for a considerable part of the length of the member. The member B is shown broken away for more clearly showing the handle 6, in the more simple form thereof here indicated. Said member 6 fits freely and slidably in the slots 3, 3^a, formed in the mid-body portion of member B, so that the wrench may be operated by said handle while this is in any one of widely varying positions. This organization of said parts makes the tool applicable to a wide range of special uses and positions, and, especially, provides for using each of the wrench-ends on nuts, as *n*, which are on long screws, as S, such, for instance, as commonly used in the air-valve devices of automobile tires, the wrench-end 2 being the smaller of the wrench-ends for use on nuts of smaller size than the nuts on which the wrench-end 1 is used.

In the form thereof here shown, (Figs. 1, 2) said handle, as 6, is provided with shoulders, or movement-limiters, 6^h, 6^k, located exteriorly of member B, whereas these limiter devices, or means, are shown in the sectional view Fig. 3, as being located interiorly of member B. Also, in Figs. 1, 2, said handle 6 is shown provided with a screw-driver end, *a*, whereas in Fig. 3, it is shown provided at one end with a screw-driver end *d*, and at the other end with a small open end wrench, W.

Thus, in the forms thereof described in connection with Figs. 1, 2, 3,—and as hereinafter explained,—the present improvements provide a multi-part tool having two principal members shiftable to varying positions relative to each other, each of which may have a plurality of tool-form ends, and each of which is usable as a handle for operating the other in any one of the said relative positions. These features give to this compound tool, considered as a whole, a wide range of applicability, and these utilities are obtained by means of a structurally simple mechanical device which is specially adapted to be manufactured at a low cost while having ample strength and dependability of operation.

The tubular wrench-body, B, is shown in

section in Fig. 4 and as having a lever, or operating handle, 6, extending loosely through the side slots, 3, 3^a, so that said handle 6 may be freely slid along in said slots and thus be made to extend nearly the whole length thereof on either side of body member B. In Fig. 4 handle 6 is shown provided at the ends thereof with enlargements, as 6^a, 6^b, for holding the member 6 assembled with the body member B.

These features may be further arranged as indicated in Fig. 5 by locating the said handle retaining means, as 6^a, 6^b, (or any well-known handle detension means of analogous function in lieu thereof), on opposite sides respectively of said member 6. Thus, as here shown, said detainer 6^a may be lower than detainer 6^b when the handle 6 is horizontal, as shown in side-view, and by solid lines in this view, Fig. 5. This construction permits the handle 6 to be shifted to a position, as indicated by the dotted lines at 6^e, nearly horizontal of member B; this provides for packing the wrench in a compact manner, as required for shipment, and other evident purposes.

In some instances the tool may be provided with a further improvement or modification of which one form is shown in Figs. 6 and 7, these views being arranged similarly to the aforesaid Figs. 1, 4 and 5 to facilitate comparison therewith. In this modification, a handle-guide, C, is located within the body B, and the handle 6 extends through the slots 3, 3^a, and through a hole at 4 in said guide or carrier C. In practice handle-carriers C, may have the form of a short cylinder, (Fig. 7) and be fitted to slide freely within the two walls 2, 2^a, of member B. Thus handle 6 may be slid to a central position, as shown in Fig. 6 or to one side, as indicated in Fig. 7, while, at the same time, the carrier C (with the handle therein) may be slid along within the member B. Also, as here indicated, handle 6 may be of the form of a short cylinder or rod, and this may be provided with end-stops, as 6^d, 6^d, for normally preventing an accidental disassembling of the parts.

In Fig. 8 a further improvement is illustrated (in a preferred form thereof), whereby to combine certain of the special features already described in connection with the pairs of views, Figs. 4, 5, and with Figs. 6, 7, respectively. In this form of improvement, said carrier C (of Fig. 7) is here shown as having the form of a sphere, here designated by C^2, and is fitted to slide freely within member B. Similarly as in Figs. 6 and 7, the handle 6 passes through guide-member C^2, and thus may be operated in the manner already explained. Also, this carrier and handle,—parts C^2 and 6,—may be swung around to a position indicated by dotted lines, (Fig. 8) to correspond in certain features with the handle-position shown by dotted lines at 6^e in said Fig. 5, thus bringing all the said parts into a compact arrangement.

The carrier construction and its mode of action, which is above described in connection with Fig. 8, has a further and special utility in connection with the use of an additional tool, supplemental to the said wrench-end elements of member B. For instance, as illustrated in Figs. 9 and 10, the carrier C^3 may be provided with a handle, as 6^e, rigidly fixed therein, and the (on one side of the carrier) member 6^e may be so extended and shaped, as at 6^f, to form a supplemental tool, *d*, which may serve as the operating handle (and "lever") for the wrench. In the present instance, (see Fig. 10), such a tool is indicated at *d*, and this is here shown as if constituting a screw-driver which is well-known, and is a kind of tool particularly useful in connection with wrench-form tools of the general class herein set forth.

Having thus described my invention, I claim:

1. In a multi-form implement, a body member having a hollow interior and having a wrench-end at one end of said hollow interior; a handle passing transversely through the mid portion of the body member and slidably movable in the longitudinal line of the body member providing lever means for operating the implement; vertically sliding guide means, in said hollow body member through which said handle reciprocates transversely and means on said handle for limiting movement thereof transversely of the body-member for retaining the handle in assembled relation to the body member.

2. In a multi-form implement, a body member having a hollow interior and having wrench-ends at the opposite ends of said hollow interior, one of said wrench-ends being smaller than the other; a handle passing transversely through the mid portion of the body member and slidably movable in the longitudinal line of the body member providing lever means for operating the implement; guide means within said body member through which said handle passes transversely and means on said handle for limiting movement thereof transversely of the body member for retaining the handle in assembled relation to the body member.

3. In a device of the class described, the combination with a body member having a hollow interior, of wrench means at each end thereof, longitudinal slots within the body member, a handle passing transversely through the slots and slidably movable therein, and means on said handle slidable within the body member for limiting move-

ment thereof transversely of the body member, whereby to retain the handle in assembled relation to the body member.

4. In a device of the class described, the combination with a body member having a hollow interior, of wrench means at each end thereof, a longitudinal slot within the body member with a guide means slidable longitudinally within the hollow body member, and a handle slidable transversely within the guide means, whereby to produce a variable leverage in the wrench means.

5. In a multi-form implement, a body member having a hollow interior and having wrench-ends at the ends of said hollow interior, one of said wrench-ends being smaller than the other, the body member being provided with longitudinal slots in opposed walls of its mid portion; a handle passing transversely through said slots and slidably movable therein in the longitudinal line of the slots providing lever means for operating the implement, guide means on said handle slidable within the body member engageable with said slots for limiting movement of the handle transversely in said slots for retaining the handle in assembled relation to the body member.

6. In a device of the class described, the combination with a body member having a hollow interior, of wrench means at one end thereof, a handle passing transversely through the mid portion of the body member, and slidable longitudinally and transversely therein for providing variable lever means for operating the implement; means slidable in the interior of said body member for guiding the handle in a transverse plane to said body member, and means for limiting the transverse movement of said handle.

7. In a device of the class described, the combination with a body member having a hollow interior, of wrench means at one end thereof, a handle passing transversely through the hollow portion of the body member, and guide means on said handle within said body member, said handle being longitudinally slidable in said hollow portion whereby to produce a variable leverage.

GEORGE E. MALONE.