

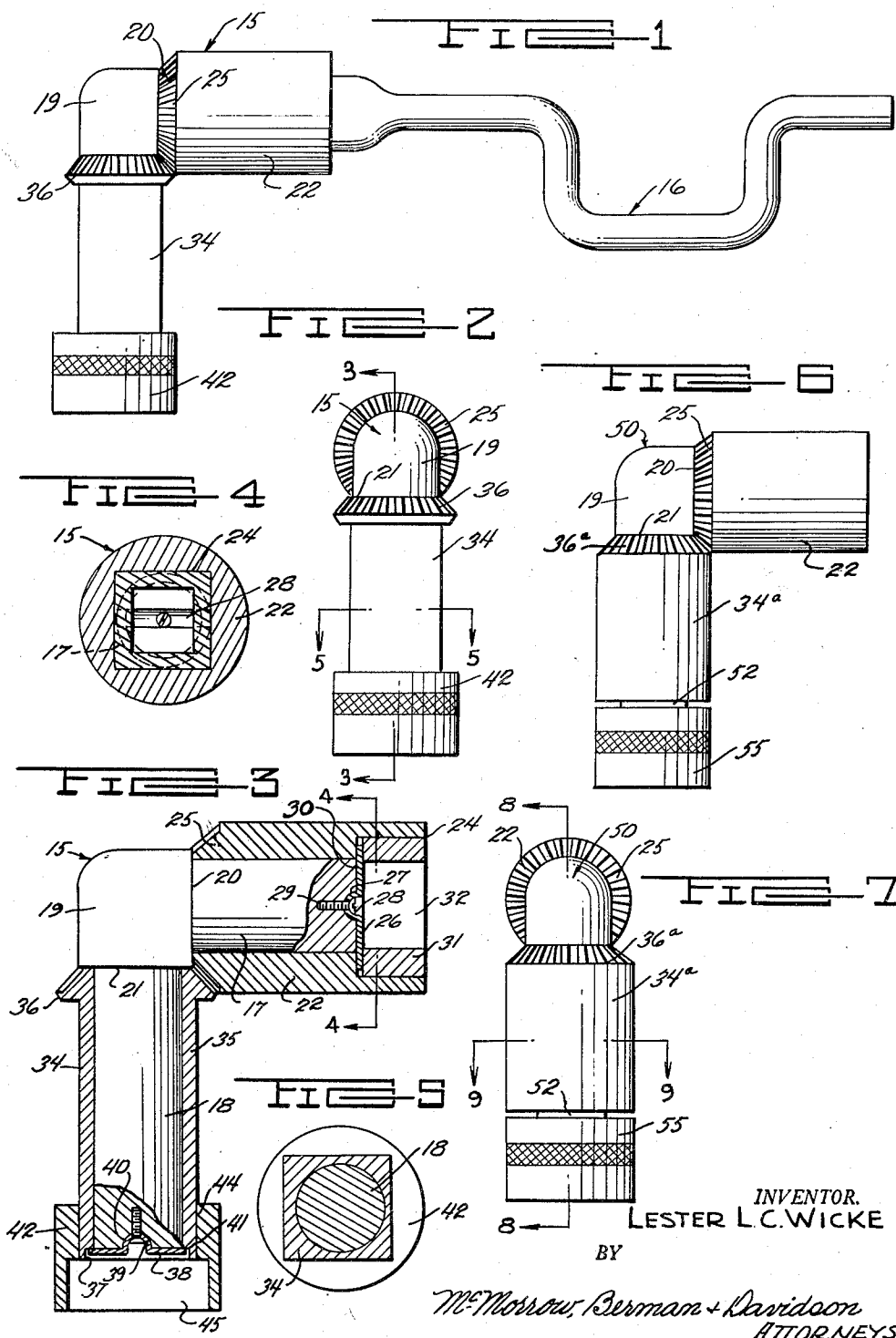
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UNIVERSAL WRENCH ADAPTER

2,562,973

Filed April 19, 1949

2 Sheets-Sheet 1



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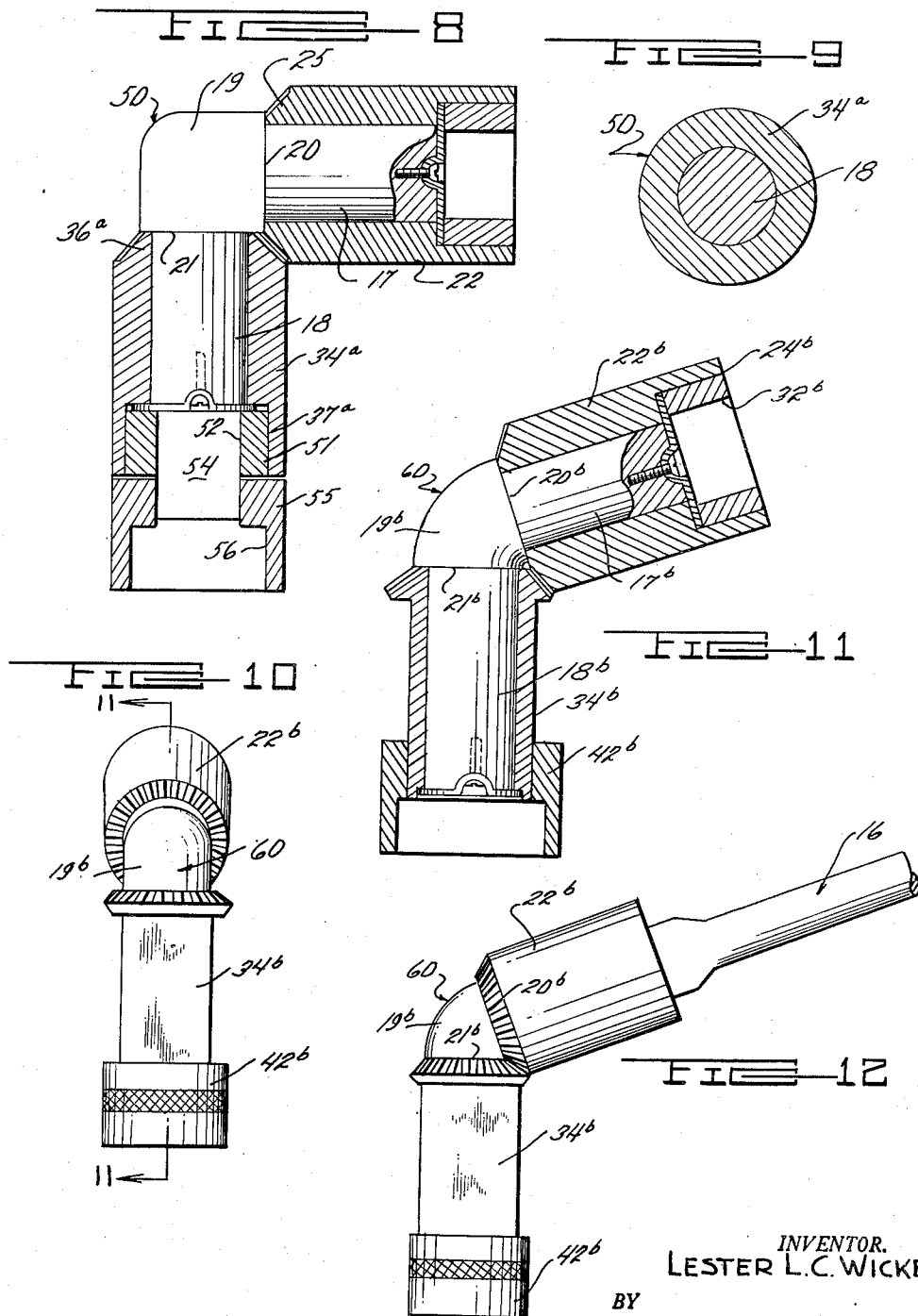
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INVENTOR.
LESTER L. C. WICKE

BY

McMorrow, Berman & Davidson
ATTORNEYS

UNITED STATES PATENT OFFICE

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UNIVERSAL WRENCH ADAPTER

Lester L. C. Wicke, Manitowoc, Wis.

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1 Claim. (Cl. 81—57)

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This invention relates to a wrench adapter, and more particularly to an attachment for socket wrenches and the like.

It is an object of this invention to provide a socket adapter of the kind to be more particularly described hereinafter particularly designed for use with socket wrench sets for use on the socket wrench handle for reaching around close corners or in restricted spaces ordinarily inaccessible to standard wrenches.

Another object of this invention is to provide a universal type of geared adapter of this kind for use between the socket, engaged on a nut or the like, and the handle therefor to provide for the unlimited, free swinging movement of the handle about the socket while providing and maintaining a direct driving connection between the handle and the socket.

In this manner a socket wrench may be used in heretofore inaccessible places and the handle may be extended to such place or position where it may be easily and efficiently operated in the desired manner for rotating the socket and nut engaged thereon.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claim.

In the drawings:

Figure 1 is a side elevation of a universal wrench adapter, constructed according to an embodiment of my invention;

Figure 2 is an end elevation thereof;

Figure 3 is a longitudinal section taken on the line 3—3 of Figure 2;

Figure 4 is a transverse section taken on the line 4—4 of Figure 3;

Figure 5 is a transverse section taken on the line 5—5 of Figure 2;

Figure 6 is a side elevation of a modified form of this invention;

Figure 7 is an end elevation of the modified form shown in Figure 6;

Figure 8 is a longitudinal section taken on the line 8—8 of Figure 7;

Figure 9 is a transverse section taken on the line 9—9 of Figure 7;

Figure 10 is an end elevation of the second modified form of wrench adapter;

Figure 11 is a longitudinal section taken on the line 11—11 of Figure 10;

Figure 12 is a side elevation of the modified form of wrench adapter shown in Figures 10 and 11.

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Referring to the drawings, the numeral 15 designates generally a universal type of adapter for socket wrench sets and the like for engagement between a socket wrench handle 16 and the sockets which are normally attached to the working end of the handle. The adapter 15 is provided for securing the socket to the working end of the handle 16 at right angles thereto in a manner whereby the socket may be rotated upon rotation of the handle 16 about its axis. The adapter 15 is particularly designed for use in place of a ratchet type of handle so that the full rotating use of the handle 16 may be applied for engaging the socket on a nut or other work piece in place of the ratchet wrench which is limited to restricted movement.

The adapter 15 is formed of a pair of right-angularly-disposed shaft sections 17 and 18 secured together at one end. The shaft sections 17 and 18 are secured together by being formed integrally with or secured to an elbow 19 having a greater diameter than the diameter of the shaft sections to form right-angularly-disposed shoulders 20 and 21. The shoulders 20 and 21 on the shafts 17 and 18 are substantially concentric to the axis of the shaft sections and form abutment members against which the inner ends of the sleeve sections carried by the shaft sections are adapted to be seated. A sleeve element 22 is rotatably supported on one of the shaft sections, as the shaft section 17, and is formed with a tool or handle-receiving recess 24 at the outer end thereof. A bevel gear 25 is fixed to or formed integrally with the inner end of the sleeve element 22 and is adapted to abut the shoulder 20 at the inner ends of the shaft section 17.

The sleeve element 22 is held on the shaft section 17 for rotation thereon by a washer 26 which is secured to the outer end of the shaft section 17. The shaft section 17 is formed with a recess 27 across the outer face thereof extending across the diameter. The washer 26 is formed with a rib 28 in the center which is adapted to be engaged in the recess 27 for holding the washer 26 against rotation relative to the shaft 17 upon rotation of the sleeve element 22. The washer 26 is secured on the shaft section 17 by a screw 29, or other suitable fastening means, which extends through the concave side of the rib 28 and into the recess 27, intermediate the length thereof. The disposition of the screw 29 in the bead 28 and recess 27 is such that the screw or bolt 29 need not be severely tightened down for adequately supporting the washer 26 in place. The washer 26 has an outside diameter greater

than the outside diameter of the shaft section 17, and is adapted to be seated in the recess 24 of the cylindrical sleeve element 22. The inside surface of the washer 26 will bear against the bottom 30 of the recess 24 for rotatably supporting the sleeve 22 in place.

The recess 24 is rectangular in configuration, though other polygonal shapes may be adequately provided for engagement of the rectangular socket-engaging end of the handle 16. For universal application of the adapter 15, the recess 24 is preferably made of an enlarged size and an adapter 31 is provided for engagement within the recess 24 for engagement of handles 16 having shanks, not shown in the drawings, of a smaller size. The adapter 31 is formed with a polygonal opening 32 through the center thereof within which the reduced shank of the handle 16 is adapted to be freely and operatively engaged.

A sleeve element 34 is rotatably supported on the other shaft section 18 for cooperation with the sleeve section 22 carried by the shaft section 17. The sleeve section 34 is rectangular in outside configuration having a cylindrical bore 35 along the length thereof. A bevel gear 36 is fixed to or formed on the upper end of the sleeve section 34 for cooperation with the bevel gear 25 carried by the sleeve section 22. A recess 37 is formed in the lower end of the sleeve section or element 34 within which the washer 38, carried by the lower end of the shaft section 18, is adapted to be engaged. The lower end of the shaft section 18 is formed with a diametric groove or recess 39 within which the bead or rib 40, carried by the washer 38, is adapted to be engaged in the same manner as the bead 28 of the washer 26 described above. The washer 38 extends outwardly beyond the periphery of the shaft section 18 and is adapted to be seated within the recess 37. The top wall 41 of the recess 37 bears on the inner surface of the washer 38 for rotatably supporting the sleeve element 34 on the shaft section 18. The upper or inner end of the sleeve section 34 rotatably bears against the shoulder 21 of the elbow at the upper or inner end of the shaft section.

The sleeve section 34 is rectangular in configuration for engagement thereon of a socket 42, which is of substantially conventional configuration. The socket or tool element 42 is formed with a recess 44 on the upper side thereof which is rectangular in configuration, within which the lower end of the sleeve section 34 is adapted to be frictionally engaged. The lower side of the socket member 42 is formed with a recess 45 therein, within which the nut or other work piece is adapted to be engaged.

In the use and operation of the adapter 15, the shank of the handle 16, not shown in the drawings is adapted to be seated in the adapter plug 31 which is frictionally engaged in the recess 24 of the sleeve 22. The socket 42 is frictionally engaged on the lower end of the sleeve 34 and is then placed in engagement with the nut or other article of work to be rotated. Upon rotation of the handle 16, the gear 25, meshing with the gear 36, will rotate the sleeve section 34 about the shaft section 18, thereby effecting the rotation of a work piece engaged within the recess 45 of the socket member 42.

In Figures 6 to 9, inclusive, there is shown a modified form of wrench adapter 50 which is formed substantially in the same manner as the wrench adapter 15 described above. The wrench

adapter 50 is formed with a pair of shaft sections 17 and 18 engaged on an elbow 19. The shaft sections 17 and 18 are formed with shoulders 20 and 21 in exactly the same manner as the shoulders on the wrench adapter 15. The wrench adapter 50 is formed with a rotating sleeve element 22 exactly the same as the sleeve element 22 of the wrench adapter 15. A cylindrical sleeve 34a is carried by the other shaft section 18 and is formed with a polygonal recess 37a on the lower open end thereof. The rotatable sleeve sections 22 and 34a are connected at their adjacent ends by the interengagement of the gear sections 25 carried by the sleeve element 22 and the gear 36a carried by the sleeve 34a. The recess 37a in the sleeve 34a is substantially deeper than the recess 37 of the sleeve 34, and an adapter 51 is adapted to be seated within the recess 37a. The adapter or member 51 is formed with a polygonal opening 52 through the center thereof within which the shank 54 carried by the socket member 55 is adapted to be engaged. The wrench adapter 15 is provided for that type of socket 42 having an opening on the upper side thereof within which the wrench is adapted to be engaged, whereas the wrench adapter 50 is formed for engagement of a socket member 55 having a shank 54 extending upwardly from the top side thereof. The socket member 55 is formed with a polygonal recess 56 on the lower side thereof within which the nut to be engaged may be seated. The sleeve sections 22 and 34a are secured on the shaft sections 17 and 18 in the same manner as the sleeve sections of the adapter 15.

In Figures 10, 11 and 12, there is shown a second modified form of this invention, designated generally by the numeral 60. The wrench adapter 60 is formed of a pair of shaft sections 17b and 18b which are secured together by an elbow 19b having outwardly-extending shoulders 20b and 21b which are disposed at an angle greater than 90°. A cylindrical sleeve 22b is rotatably supported on the shaft section 17b in substantially the same manner as the sleeve sections 22 described above. The sleeve section 34b rotatably supported on the shaft section 18b is rectangular in outside configuration, in substantially the same manner as the sleeve section 34, of the wrench adapter 15. A socket 42b is carried by the lower free end of the rectangular sleeve member 34b in the same manner as the socket member 42 of the adapter 15. The wrench 60 is adapted to be engaged in the central opening 32b of the adapter socket carried in the outwardly-opening recess 24b formed in the upper outer end of the sleeve element 22b.

I do not mean to confine myself to the exact details of construction herein disclosed, but claim all variations falling within the purview of the appended claim.

I claim:

A universal wrench adapter comprising a first shaft, a second shaft positioned at an angle with respect to said first shaft and having one end secured to one end of said first shaft, a first hollow sleeve circumposed upon said first shaft inwardly of said one end of the latter and connected to said first shaft for rotation therearound, a second hollow sleeve circumposed about said second shaft inwardly of said one end of the latter and connected to said second shaft for rotation therearound, a beveled gear on said one end of each of said sleeves, said beveled gears being in meshing engagement with each other, a first

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socket adapter fixedly positioned within said first sleeve adjacent the other end of the latter and having one end in engagement with the other end of said first shaft and having the other end flush with the other end of said first sleeve for receiving an end of a driving element, and a second socket adapter arranged in end to end abutting relation with respect to the other end of said second sleeve for receiving the head of an element to be driven, a hollow locking member provided with a polygonal shaped bore fixedly positioned within said second sleeve adjacent the other end thereof, and a shank secured to and projecting from the abutting end of said second adapter and slidably engageable with said polygonal bore.

LESTER L. C. WICKE.

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