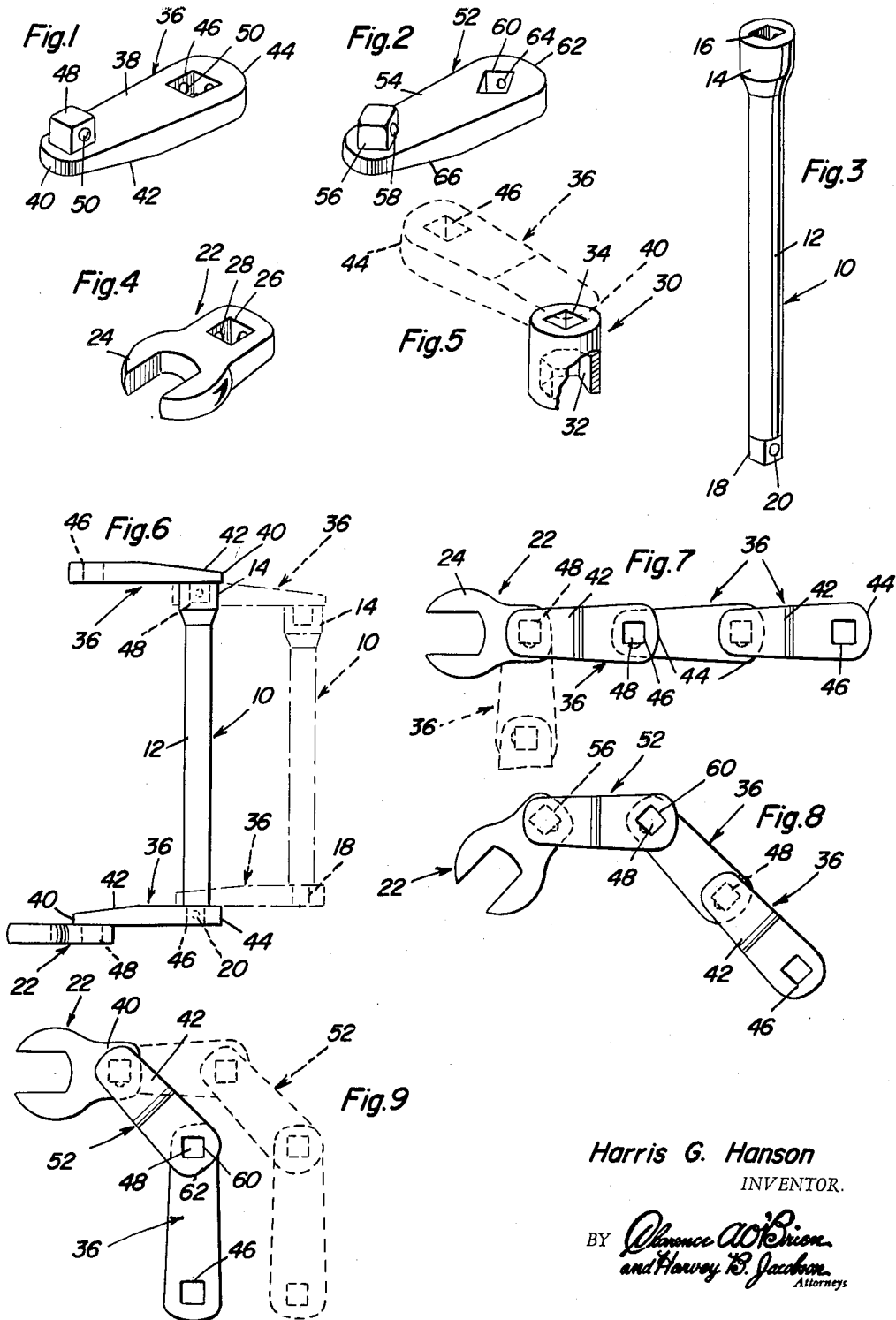


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HANDLE WITH SELECTIVELY USABLE WRENCH
HEADS ATTACHING UNITS
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HANDLE WITH SELECTIVELY USABLE WRENCH HEADS ATTACHING UNITS

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This invention relates to hand tools, generally speaking, but has reference in particular to a handle having novel attachments or units which are detachably mounted on the ends of the handle, said attachments being expressly designed and adapted to accommodatngly and securely mount wrench heads on the handle.

The expression "wrench heads" will be used herein in a general or generic sense to comprehend, let us say, conventional-type sockets of the many and various sizes in use, box end wrenches, and open end or so-called crowfoot wrenches, each of which has a suitable work-gripping head at an outer end and a hole or socket at the inner end and provided, as is usually the case, with a plurality of spring-loaded ball retainers or detents. As is known, machine elements and companion parts are assembled and held together by nuts, bolts, cap screws and similar fasteners of more or less standard sizes and shapes. End wrenches and sockets are obviously of countless sizes and shapes. Special purpose tools too numerous to touch upon here are also in vogue inasmuch as, through the years, the work areas have become increasingly inaccessible to repairmen and mechanics. This ever changing picture, so to speak, constitutes the problem which has given rise to the instant endeavor to solve it satisfactorily.

To the end desired, the present invention pertains to improved handle means which makes it possible for the user to assemble, on the spot, the desired handle shape which he will need for a given or particular job where, for example, the conventional wrench head must necessarily do its job in a place difficult of access. Stated otherwise, the handle means herein disclosed will serve the unique purposes for which it is designed and intended.

Admittedly, it is impractical for the average mechanic or workman to transport, care for, purchase and store all of the special purpose wrenches and tools that may be required for efficient service and repair work. It follows that the instant concept has to do with simple, practical and economical means the use of which will overcome many of the difficulties and problems which currently beset the required users thereof.

It is to be pointed out at the outset that the present invention comprehends not only the aforementioned handle means characterized by selectively usable wrench head attaching units or adapters, but an easy-to-convert manually usable sectional or knockdown tool. Briefly summarized, this improved tool is characterized by an elongated handle, an individual conventional-type wrench head having a work-grip at one end and handle attaching and retaining means at the other end, and adapting and positioning means interposed between the handle and wrench head and separably joined to said other end and also separably joined to one end of said handle, said means being disposed in a plane with its lengthwise axis at a right angle to the lengthwise axis of said handle, said

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means serving to transmit the applied force of the handle to said head and making it possible to effectually utilize the thus coupled head and handle in places otherwise difficult of access.

Reverting to the handle means as distinguished from the aforementioned complete ready-to-use tool, this has to do with a means for the use thereon of the aforementioned wrench heads. This handle means comprises a handle having a lateral arm at at least one end, said arm being optionally variable and adjustable in length to cope with ever-varying work requirements, the outer end of said arm having means whereby any one of the aforementioned wrench heads may be removably but operatively attached thereto.

Novelty is also predicated on the construction mentioned wherein said arm is detachably joined to said handle and also is adjustable in the sense that it may be either straight from end to end or curved at the outer end, whereby the handle and wrench head may be related angularly depending on the requirements of the job at hand.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a view in perspective of one of the attaching units, also referred to as an insertable and removable and selectively usable link;

FIG. 2 is a view in perspective of the same type of link or unit except that the socket-forming hole and keying stud have oblique angle relationship in respect to the lengthwise dimension of the link's body;

FIG. 3 is a perspective view of the handle per se;

FIG. 4 is a perspective view of a conventional open end wrench commonly referred to as a crowfoot wrench and constituting one of the aforementioned "wrench heads";

FIG. 5 is a perspective view showing a socket with a portion broken away and appearing in section;

FIG. 6 is a side elevational view showing the handle with an adapter link keyed on the upper end and a corresponding adapter link on the lower end attached to a crowfoot wrench;

FIG. 7 is a top plan view illustrating the aforementioned adjustable arm made up of a plurality of the adapter links;

FIG. 8 is a plan view similar to FIG. 7 but showing one of the angling links (FIG. 2) in use; and

FIG. 9 is a plan view showing a different arrangement of links in a made-up arm, and with several links in an alternate arrangement in phantom lines.

The handle (FIG. 3) 10 comprises an elongated rod 12 having a head 14 at the top provided with a recess or socket 16 provided interiorly with spring-loaded detents (not detailed). The lower end is provided with a slightly reduced stub-shank 18 with ball detents 20. In practice several, more or less, handles of different lengths will be used.

Two of the aforementioned wrench heads are seen in FIGS. 4 and 5. The one in FIG. 4 denoted at 22 is a crowfoot or open end wrench the head portion being de-

noted at 24 and the socket at 26, the same being provided with ball detents 28. The socket, also conventional, is seen in FIG. 5 and is denoted by the numeral 30 and has a work-gripping head 32 and a socket 34 provided with suitable ball detents.

Any number of adapter and attaching units or links may be employed in making up the angularly adjustable extension arms seen for example in FIGS. 7, 8 and 9. Each link or adapter is basically the same and will vary only in size. The adapter seen in FIG. 1 is denoted by the numeral 36 and comprises a rigid body 38 the left hand end 40 of which is thinned by tapering as at 42. The broader opposite end 44 has a socket or hole 46 therein and both this socket and the square keying stud at the end 40, the latter denoted at 48, have spring-loaded ball detents 50.

As seen in full lines in FIG. 6, a single adapter link or unit is in place at the upper socketed end of the handle. This link takes a position at right angles to the axis of the handle. The keying stud 48 is fitted into the socket and removably retained in place. The socket or hole 46 at the left is available for the accommodation of a readily applicable and removable wrench head (not shown).

At the bottom the adapter link is reversed in relation to the one seen at the top and here the end portion 44 underlies the shouldered end of the handle and the stub-shank 18 is fitted into the socket 46 and held in place by the retaining balls. As seen here the crowfoot wrench is attached to the stud 48 and the adjacent end portions of the wrench head and link are overlapped thus spacing the wrench head from the handle by way of the intervening coupling link 36.

The aforementioned arm, where a reach arm is needed for a particular job, is made up of a plurality of links joined together and with the wrench head or end wrench on the remote end of the arm. Thus one end of the arm is connected to the handle, the wrench head is spaced away, and the links of the arm accommodate this particular assemblage.

In the same manner, an arm may be constructed as shown in FIG. 8 wherein the two links are in line with each other and the other special link 52 (FIG. 2) is brought into play. This permits the wrench head to be angled in the manner shown. The same result is possible by using two or three links to make up the arm as illustrated in FIG. 9. Obviously, all of the various ways in which the links may be assembled to accomplish the different results need not be herein illustrated.

With respect to the link 52, this comprises a body 54, an oblique angled rectangular keying stud 56 with ball detent means 58 at one end and an oblique angled hole or socket 60 at the end 62 and provided with a ball detent 64. The tapered end is designated at 66.

This improved tool, and especially the handle means, will enable persons who require extreme lightness and compactness in a wrench kit, to carry a kit covering all possible anticipated needs for emergency repairs.

This wrench handle consisting of six pieces (to which more may be added at user's option) will, when used with standard crowfoot end wrenches, sockets and extensions found in any mechanic's tool kit, solve the problem of turning nuts and bolts in places difficult of access. It can be assembled almost instantly then reassembled for a different application thereof.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An easy-to-convert manually usable tool comprising, in combination, an elongated handle, a conventional-type

nut and stud-engaging wrench head having a work-grip at one end and attaching and retaining means at the other end, and adapting and positioning means for said wrench head interposed between the handle and wrench head and separably joined to said other end and also separably joined to one end of said handle, said means being disposed in a plane with its lengthwise axis at a right angle to the lengthwise axis of said handle, serving to directly and positively transmit the force applied to the handle to said wrench head and comprising a rigid wrench head supporting, position-extending and offsetting link, said handle comprising a rod having means at either end for accommodating and joining said link separably thereto, said link being linearly straight and having a square socket at one end provided with spring-loaded ball detents, and a lateral rectangular stud at the other end also provided with spring-loaded ball detents, said socket and stud being of corresponding cross-sectional dimension.

2. Handling means for conventional-type wrench heads such as sockets, open end and box end wrenches comprising: a handle having a laterally projecting arm at at least one end of said handle, said arm being adapted to support and operate a selectively usable wrench head and being optionally variable and adjustable in length to cope with ever-varying work requirements, said arm having means on an outer end whereby one of the aforementioned wrench heads may be removably but operatively attached thereby and mounted thereon, said arm being detachably joined at an inner end thereof to said handle and also being variable in plan so that it may be rendered straight from end to end or angled to the left or the right of the straight line defined when said arm is straight in a lengthwise direction whereby the handle and wrench head, when in operative position on said arm, may be related angularly depending on the requirements of the job at hand, said arm embodying a plurality of adapter links adjacent ends of which are separably connected together, said adjacent ends being overlapped, each link being the same in construction and having a square socket at one end provided with spring-loaded ball detents, and a lateral rectangular stud at the other end also provided with spring-loaded ball detents, said socket and stud being of corresponding cross-sectional dimensions.

3. Handling means for conventional-type wrench heads such as sockets, open end and box end wrenches comprising an elongated linearly straight rod providing a handle and having, at one end, an axial keying and retaining socket with internal ball detents, and having, at the other end, an axial keying and retaining stub-shank with accompanying ball detents, at least one rigid adapter link for supporting and offsetting a wrench head, said link being applicably attachable at one end to either end of the handle and having a mating ball-detent-equipped lateral stud at one end to fit into said keying socket, and a socket-forming hole at the other end for removable reception and retention of said stub-shank, said stud and said hole both being square in cross-sectional shape and cocked at an angle so that the marginal surfaces are disposed at oblique angles relative to the lengthwise axial center of the overall link.

4. For use in turning and driving screw-threaded nuts and headed studs, an adjustable hand tool comprising, in combination, a wrench head having means at one end for releasably engaging a nut on the head of a stud and for turning the same and having a keying and stud receiving and retaining square socket at the other end, a rigid elongated handle adapted to assume a position with its longitudinal axis at right angles to the axis of said wrench head when in use, said handle embodying a straight rod having an axially disposed keying and retaining socket and internal ball detents at one end, having an axially projecting keying and retaining stub-shank with accompanying ball detents at the other end, a plurality of straight rigid wrench head supporting and adjusting links, said links being adapted to project to assume a position

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at right angles to the axis of said handle, at least one of said links having a square socket at its handle-attached end provided with spring-loaded ball detents, the other end of said link having a lateral rectangular stud also provided with spring-loaded ball detents, said socket and stud being of corresponding cross-sectional dimensions, the stud on said handle being fitted retentively but releasably in the square socket provided therefor on the cooperating end of said link, the stud on said link fitting into the socket provided therefor in the aforementioned wrench head, the adjacent end portions of said wrench head and link being disposed in overlapping relationship.

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