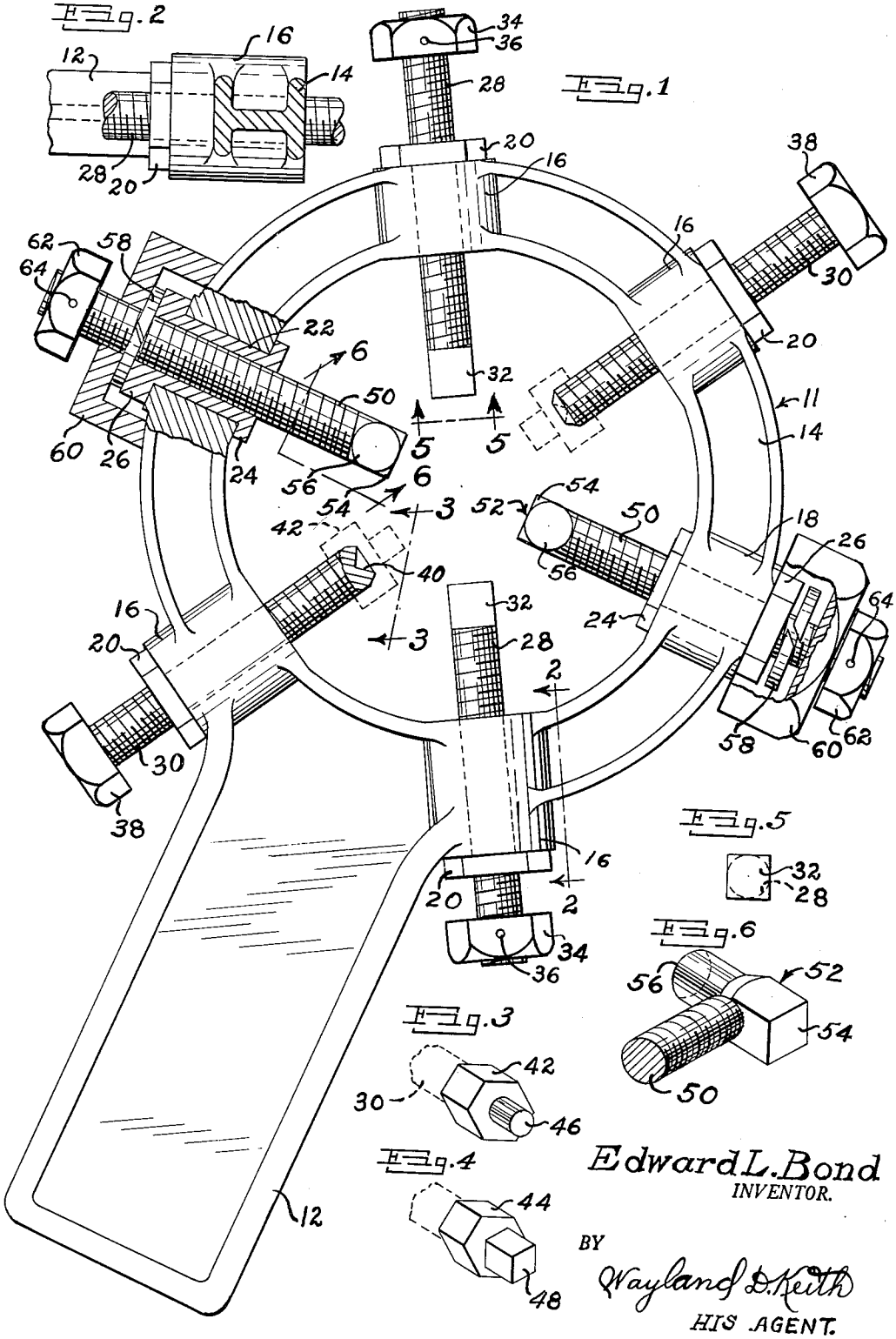
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ADJUSTABLE SPANNER WRENCH

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Edward L. Bond
INVENTOR.

BY Wayland D. Keith
HIS AGENT.

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ADJUSTABLE SPANNER WRENCH

Edward L. Bond, 422 Ohio Ave., Wichita Falls, Tex.

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This invention relates to improvements in wrenches and more particularly to a multi-purpose wrench for operating on devices which would normally require a special spanner wrench for each part. The present wrench is so designed as to make it possible for one tool to be used instead of a number of spanner wrenches, as has heretofore been necessary, and where the device being operated upon is accessible to put the wrench on the device or to remove it therefrom.

Various wrenches have been proposed heretofore which would perform specific operations on a limited number of applications. However many screw elements, particularly packing glands such as used on hydraulic jacks, require a separate and independent wrench for each side jack made by one manufacturer. Likewise, the wrench that will fit the glands of the jacks produced by one manufacturer will not fit the comparable glands of jacks made by another manufacturer. The present tool is designed to fit all such glands, as well as being applicable to various other utility operations, such as fitting cylindrical devices, heaxagonal devices or elements with irregular shaped heads, merely by making the necessary adjustments to the various threaded elements which are provided to engage the device to be acted upon.

The present tool has been designed so that it can be operated by the use of a minimum number of wrenches to make the required adjustments of the various screw elements, and provision is made to lock the screw elements in place, once the proper adjustment has been made.

While the body of the present tool is shown to be of a single unit construction, which adapts itself to low cost construction, and for use on all packing glands and other spanner nut elements over which the tool can be passed, as over the end of a shaft or ram to fit on a spanner wrench nut, it is to be understood that it is within the inventive concept of the device to sever the body of the tool diametrically at any point between the spaced apart screw elements, and to couple the severed portions together by means of pins, such as shown in the patent to Meyer, No. 2,386,254. This feature is considered old, however, and no claim is made to this feature per se.

An object of this invention is to provide a multi-purpose tool which will operate on any type screw element on which it may be fitted.

Another object of the invention is to provide a multi-purpose tool which will act upon circumferentially disposed spanner nut elements, either slotted or having holes therein, and upon radially disposed slots formed in an end of a member, and also upon axially aligned holes either round or rectangular, and upon smooth cylindrical surfaces without holes therein. The tool is also designed to be used on elements with heads of any shape, such as square, pentagonal, hexagonal, or other polygonal shape.

Still another object of the invention is to provide a tool which is simple in construction, which may be readily assembled and disassembled, and whereon smaller or larger spanner nut engaging elements may be substituted for the elements therein, and which elements may be securely locked in place when in adjusted position.

Yet another object of the invention is to provide a tool which is low in the cost of manufacture, which is sturdy in construction, and which is adaptable to many uses.

With these objects in mind and others which will become manifest as the description proceeds, reference is to be had to the accompanying drawings, in which like

reference characters designate like parts in the several views thereof, in which:

FIG. 1 is a top plan view of the tool with parts broken away and other parts being shown in section to show the details of construction, and with other parts being shown in dashed outline to represent the positioning of certain accessory elements;

FIG. 2 is a fragmentary cross-sectional view taken on the line 2—2 of FIG. 1, looking in the direction indicated by the arrows;

FIG. 3 is a perspective view taken on the line 3—3 of FIG. 1, looking in the direction indicated by the arrows, and showing an accessory attachment with a cylindrical end, with the screw element to which it is attached being shown in dashed outline, the cylindrical end of the accessory attachment being coaxial with the screw;

FIG. 4 is a perspective view similar to FIG. 3 but showing an accessory attachment the end configuration of which is a rectangular solid with the axis thereof coaxial with the screw;

FIG. 5 is a view taken on the line 5—5 of FIG. 1, looking in the direction indicated by the arrows and showing a spanner nut engaging element which is preferably square and which is made integral with the screw, the spanner nut engaging element being coaxial with the screw; and

FIG. 6 is a perspective view taken on the line 6—6 of FIG. 1, looking in the direction indicated by the arrows, and showing a still further modification of a dual spanner nut engaging element.

With more detailed reference to the drawing, the numeral 11 designates generally the body of the spanner tool, which is preferably of ribbed, I-beam construction, so as to give the maximum strength with the minimum of weight, and which tool is shown to have a handle 12 extending radially outward from a circular body portion 14, which handle is also of the I-beam type construction, the opposite sides of which are flat surfaces on which an impact blow may be delivered, as by a hammer. The circular body portion 14 has circumferentially spaced bosses 16 and 18 thereon, the axes of which bosses are perpendicular to the axis of the circular body portion 14. The bosses 16 each preferably has at least the outer end thereof faced to receive the respective lock nuts 20 thereagainst. The bosses 18, which are diametrically disposed in body 14 each preferably has a larger bore therein to receive the respective threaded bushings 22, which bushings 22 preferably have up-set, polygonal heads 24—26 on each end thereof so as to enable the turning of the respective bushings 22 by means of a wrench.

The bosses 16, when taken with bosses 18, are preferably of such spacing as to allow the boring of holes therethrough on 60 degree spacings. The axes of which holes are radial with respect to the body 14. The bosses 16 are each screw threaded to receive the respective pair of screw threaded elements 28 and 30, with the screw threaded elements 28 being located diametrically of the body 14 and the screw threaded elements 30 also being located diametrically of the body 14. A lock nut 20 is provided on each of the screw threaded elements 28 and 30 so as to hold these elements in the desired adjusted position.

Each screw threaded element 28 has an end 32 thereof squared, as indicated in FIGS. 1 and 5. The squared end 32 is shown to be the same diameter across the "flats" as the diameter of the screw threaded element 28, therefore, to threadably engage the screw threaded element 28 with the screw threaded bosses 16, the screw threaded end of the screw threaded element 28 may threadably engage the respective bosses 16 from the inside, and be screwed outward until the squared end portions 32 are spaced apart

the desired distance. If screw threaded elements 28 are used in bosses 16, the diagonal distance across the respective squared ends is less than the root diameter of the respective threaded elements 28, the screw threaded elements 28 may threadably engage the bosses 16 from the exterior thereof. A nut 34 is secured to the outer end of each screw threaded element 28 by means of a pin 36. When a screw threaded element 28 is inserted into the screw threaded hole of a boss 16 from the inside, the screw threaded element is shorter than the inside diameter of the body 44. However, if the greatest dimension across the points of the squared end 32 is less than the root diameter of the threads of the screw threaded element, the screw threaded element may be inserted from the outside through the screw threaded holes in certain of the bosses 16.

The screw threaded elements 30 are perferably of the cupped, "set screw" type. However, for the sake of uniformity, it is preferable to have the hexed heads 38 thereof of the same hexagonal dimension, to enable the use of a wrench of the same size to be used on all such members of the tool. The inner end of each screw threaded element 30 has a cupped point 40, which is preferably hardened to bite into metal to prevent slippage when used on rounded elements and for engaging non-uniform, polygonal shapes. The inner end of each screw threaded element 30 is adapted to threadably receive the respective special screw threaded attachments 42 or 44, with the screw threaded attachment 42 having a round projection 46 extending outward therefrom and being coaxial with the screw threaded element 30. A rectangular solid 48 extends outward from screw threaded attachment 44. The provision of these screw threaded attachments, provides various size points which may be either square or round, which will readily lend to the performance of spanner wrench operations on a variety of sizes of screw threaded spanner nuts.

Screw threaded elements 50 are provided to threadably engage screw threaded bushings 22, which screw threaded elements 50 are of a length less than the unobstructed diameter of the body 14. The inner end of each screw threaded element 50 has transversely disposed member 52 secured thereto or made integral therewith. One end of each member 52 has a squared end portion and the other end portion thereof is a rounded projection 56. Each screw threaded member 50 has a lock washer 58 thereon, which lock washer is fitted within the respective cupped lock nuts 60. The cupped locks 60 are of a depth to bindingly engage the lock washer 58 between the inner end thereof and the hexagonal end 26 of the respective bushings 22, so as to secure the bushings against rotation with respect to the respective lock nuts 60.

Each lock nut 60 has a concave face to engage the outer cylindrical portion of the body 14, as the lock washer 58 engages the hexagonal end portion 26 of each bushing 22, and since the lock nut 60 will frictionally engage the body 14 and the screw threaded elements 50, the screw threaded element 50 and bushing 22 will be held against rotation, so as to lock the ends 54 and 56 in the desired relation with respect to the axis of the body 14. It is usually preferable that the axis of the transversely arranged member 52 to be parallel with the axis of the body 14. However, the transverse member 52 may be arranged so the axis thereof will be at a right angle to the axis of the body 14 and the end surface used to engage a regular polygon, such as a square, hexagon or the like, to enable the removal thereof.

The outer end of each screw threaded element 50 carries a nut 62 thereon, which nut is secured in fixed relation with respect to the respective screw threaded elements 50 by means of a pin 64, which pin passes transversely through the nut 62 and the respective screw threaded element.

Operation

To perform an operation on a spanner nut or other element with the tool described above, the tool is secured in fixed relation to the spanner nut or the like. The size of the holes or slots in the spanner nut are noted, and also the position in which they lie with respect to the axis of the spanner nut, then the particular screw threaded element which will complementally fit these particular slots or holes is adjusted until the end or tip thereof properly engages the spanner nut or the like. It is then advisable, when possible, to adjust two or more of the other screw threaded elements inward until the spanner nut is engaged so as to aid in centering the tool with respect to the spanner nut. Pressure is then applied to the handle 12, either by manual pull thereon or by an impact from a hammer or the like, until the desired turning action is accomplished. In certain instances it may be desirable to unscrew round or cylindrical elements, whereupon screw threaded elements 30 are moved inward until the cupped points 50 firmly engage the element to be acted upon, and with the other screw threaded elements firmly engaged, pressure is applied to the handle 12 by impact or pressure to perform the desired turning action thereon.

In certain spanner nuts holes or slots are formed, in which pointed ends 46 or 48 of corresponding size will engage. When this condition exists, screw threaded accessory elements 42 or 44 may be threaded onto the screw threaded element 30 to perform the desired turning action, or which points may supplement squared ends 32, as desired.

In performing a turning action on polygonal elements, the various screw elements may be moved inward until the greatest pressure exists on the polygonal element and the particular cupped points 40 engaged so as to give the maximum bite to enable the polygonal element to be turned.

It will be readily seen that the present tool may be utilized to perform an operation on any type of spanner nut or other screw element, so long as the tool may be passed over the end thereof, and that by dividing the tool into two semi-annular elements, as shown by the above mentioned patent, one of the pins may be removed so as to enable the passing of the tool around a shaft, such as a piston rod, to enable the tightening of the glands on pumps or the like, having any shape of spanner nut thereon on which the elements may engage.

Having thus clearly shown and described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An adjustable spanner wrench for engaging spanner nuts and the like; comprising an annular body, a handle on said body which extends outward therefrom, a plurality of transversely disposed, circumferentially spaced bosses on said annular body, said bosses being apertured radially with respect to said body, certain of said bosses having a smooth cylindrical bore formed therein, a complementary cylindrical sleeve fitted within the respective smooth cylindrical bores, a spanner nut-engaging means fitted within said respective sleeves, and means holding said spanner nut-engaging means in fixed relation with respect to said sleeve and with respect to said annular body, screw threads formed in certain of said apertures of said bosses, screw threaded elements complementally engaging said screw threaded apertures of said bosses, an element on the outer end of the respective screw threaded elements which is adapted to complementally receive a wrench thereon, the inner end of certain of said screw threaded elements having a spanner nut-engaging element thereon, and lock nut means to selectively lock the respective screw threaded elements in fixed relation with respect to said body.

2. An adjustable spanner wrench for engaging spanner nuts and the like; comprising an annular body, a handle on said body which extends outward therefrom, a plurality of transversely disposed, circumferentially spaced bosses on said annular body, said bosses being apertured radially with respect to said body, screw threads formed in certain of said apertures of said bosses, screw threaded elements complementally engaging said screw threaded

apertures of said bosses, an element on the outer end of the respective screw threaded elements which is adapted to complementally receive a wrench thereon, the inner end of certain of said screw threaded elements having a spanner nut-engaging element thereon, lock nut means to selectively lock the respective screw threaded elements in fixed relation with respect to said body, at least two of said apertures being axially aligned, an internally screw threaded sleeve fitted in each of said axially aligned apertures, a further screw threaded element complementally engaging each of said screw threaded sleeves, and lock nut means screw threaded onto the respective last mentioned screw threaded elements and complementally engaging said annular body to lock said last mentioned screw threaded elements in adjusted, fixed relation with respect to said body.

3. An adjustable spanner wrench as defined in claim 2; wherein said spanner nut-engaging elements on the inner end of the respective last mentioned screw threaded elements is transversely disposed with respect thereto.

4. An adjustable spanner wrench as defined in claim 2;

wherein said spanner nut-engaging element on the inner end of the respective last mentioned screw threaded elements is transversely disposed with respect thereto, one end of which transversely disposed spanner nut-engaging element has a rounded portion thereon and the other end of said transversely disposed spanner nut engaging element being polygonal in shape.

5. An adjustable spanner wrench as defined in claim 2; wherein each of said sleeves is independently rotatable in its respective apertured boss independent of the rotation of said screw threaded element, and locking means to simultaneously lock said last mentioned screw threaded elements and said sleeves with respect to said annular body.

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