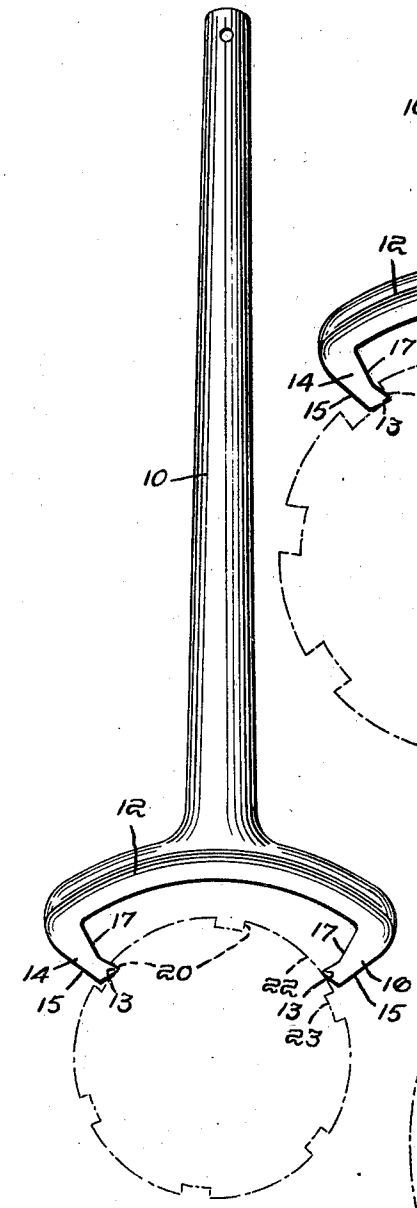
May 13, 1947. C. H. BARKER 2,420,458

SPANNER WRENCH

Filed Jan. 14, 1944

Fig. 1.



1¼ INCH HOSE SIZE
NAVY SPECIFICATIONS 34 F 3(INT)

Fig. 2.

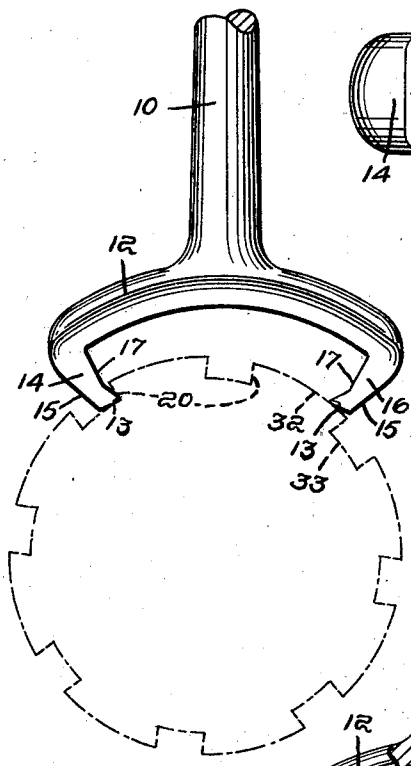


Fig. 4.

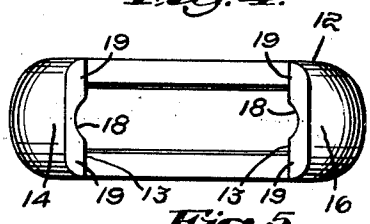


Fig. 5.

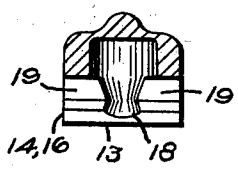
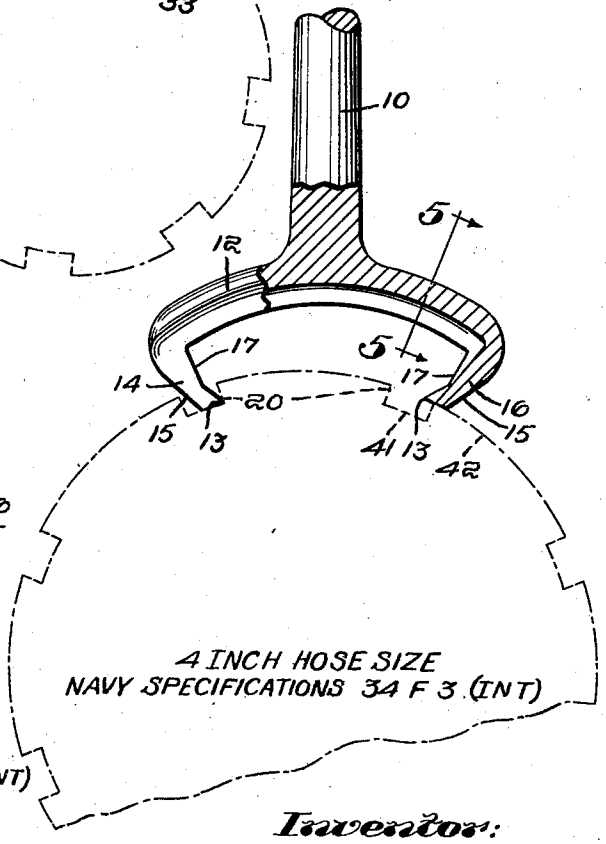


Fig. 3.



4 INCH HOSE SIZE
NAVY SPECIFICATIONS 34 F 3 (INT)

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SPANNER WRENCH

Clifford H. Barker, Boston, Mass.

Application January 14, 1944, Serial No. 518,264

1 Claim. (Cl. 81—90)

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This invention relates to improvements in spanner wrenches.

More particularly it relates to wrenches for hose couplings of the type known as Navy slotted couplings, used on fire hose, deck hose and suction hose, also on linen and rubber-lined hose, on ships and for municipal and industrial protection against fire, the object of the invention being to provide a single spanner wrench that will operatively fit any and every coupling of the sizes in which these couplings are commonly made, viz, in the range from "1½ inch hose" to "4 inch hose," inclusive. Navy slotted couplings are screw couplings each member of which has a cylindrical exterior in which there are shallow slots at regular intervals around the cylinder. The side walls of these slots, approximately radial and extending parallel to the axis, act as sunken lugs, to be engaged by a spanner for turning the coupling member.

In the smallest size of the said range of sizes the coupling member is a cylinder of about three inches diameter, and these slots are one-eighth inch deep and one-quarter inch wide and are 60° apart. In the largest size in the said range the coupling member is a cylinder over six inches in diameter, and the slots in it are one-half inch wide and three-sixteenth inch deep, at 45° intervals. The standard spanner wrench for each such Navy coupling has an arcuate body curved on a radius to fit and rest against the periphery of the coupling member. One end of this arc curve has a lug to engage in any one of the slots; and the other end of the body curve is continued in a straight handle which is approximately on the line of what would be a prolongation of the chord of that arc; the profile of the whole spanner resembling a longitudinal section through a table spoon. Thus a separate size of spanner is necessary for each size of coupling of Navy slot type. Navy ships and other vessels have numerous outlets for fire hose and hose of other sorts, of various sizes; and safety requires that a spanner of proper size and type be provided for, and be kept beside, each outlet. The absence of a workable spanner at time of need may be an inconvenience, very costly in the case of fire.

Four other styles of couplings also exist, in older ships; in ships having equipment obtained casually while away from home port; and in municipal fire departments—viz, those called, "Pin-lug," "Roll-pin lug," "Slidewell lug" and "Rocker lug," in each of which the lug is an eminence, of a nature indicated by its name, rising from the cylindrical surface of a screw coupling member.

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Although spanners are known which are called "universal" for use with these exterior eminence types of lugs, these are not satisfactory with the Navy slotted couplings. For turning the coupling member in reverse direction, each of these types, as also every spanner of the standard Navy type, has to be reversed so that the spanner's handle sticks out in the opposite direction, which may require the operator to move to the other side of the hose.

The present invention is a discovery that one single individual wrench can be made so as to operate any and all of these types and sizes of coupling—thus providing for both economy and safety. The new spanner has the form of a T with reversed head ticks. That is, at the ends of the T-head—which may be straight but preferably is curved concavely upward from the T-leg—are opposed identical prongs extending upward and inward toward where the axis of the coupling will be, high enough so that they constitute short legs that keep that part of the body of the spanner which is between them bridged from contact with the periphery of any coupling member of the smallest size in said range to which they may be applied. Preferably they may extend further than that, to a length of about half or three-quarters of an inch so as to exceed the height of any coupling lug of the eminence type. These prongs have tips thin enough to enter the smallest of Navy coupling slots, with acute angled toes pointing oppositely inward, constituting claw-lugs. The lug surfaces that make the angular toe have clearance, except at the vertex edge of the toe, both from the bottom of the slot and from that side wall of the slot which constitutes its sunken lug; and the back side of each prong converges with its inward face side and is scarfed if necessary to make its tip thin enough to enter the coupling slot of smallest size. Either lug can then constitute a claw and be a work lug, while the other can be a fulcrum, and the leg of the T be a power arm of a lever, to rotate the coupling member about its axis. Whichever lug may happen to be chosen can be set into a coupling slot, to be the claw and work lug, and the other lug will lodge on the periphery of the coupling member to act as a fulcrum. The moment resulting from applying power to the lever first locks the claw under the overhanging part of the sunken lug on the coupling, and then tends to turn the coupling member about its axis.

If the spread between the tips of these spanner lugs does not much exceed 2¼ inches the spanner can be applied to even the smallest size (1½ inch

hose) without danger of the two claws becoming cramped in two slots, for the fulcrum will lodge at a place which is not beyond the land which is second from the slot in which the claw is. A spread of 2⅛ inches between claw tips is preferred, in which case the fulcrum, when applied to the largest coupling (4 inch hose), will lodge in the midst of the first coupling slot. The spread between tips may be shorter if desired. In each case the toe of the fulcrum lug provides a definite location of fulcrum, however rough or inaccurate the surface of the coupling member may be, in a position where it presses approximately perpendicularly on a near-by circumferential part of the periphery, such that the path in which the work lug claw tends to travel is obstructed by the approximately radial wall of the slot, which is the sunken lug of the coupling, thus locking the spanner firmly in position, so long as power continues to be applied, and converting its power arm, the leg of the T, into a capstan bar for turning the coupling member.

These principles may be embodied in various forms, that which is herein illustratively shown being at present preferred as being economical of metal in providing requisite strength, and being most convenient and effective for practical use. In this the lugs are symmetrical, having faces that are combinations of surfaces suited for engaging and holding the several types of coupling lugs above mentioned, and the bridging is provided by concaving the bar head of the T on that side on which the lugs are.

This wrench can be applied to a coupling, with approach in radial direction, for turning it either way, the handle outstanding substantially on a radius of the coupling. Power is thus applied more favorably than if a handle of equal length were a continuation of a chord, without requiring that the lug on the coupling be undercut to avoid danger that a misdirection of the operator's power may dislocate the spanner.

Embodiments of the invention are not limited to precise details here portrayed, but may be varied within the scope of the appended claim.

It is intended that the patent shall cover, by suitable expression, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawing:

Figure 1 is a side elevation of a spanner wrench embodying a preferred form of the invention applied to a dot and dash representation of the exterior periphery profile of a 1½ inch Navy slotted hose coupling; these being represented in true proportion relative to each other;

Figures 2 and 3 show the same embodiment of the invention applied to larger sizes of couplings, that in Figure 3 being the "4 inch hose" size, and the spanner being partly in medial section;

Figure 4 is an end face view of the spanner wrench of Figures 1–3; and

Figure 5 is a section on the line 5—5 of Figure 3.

In the preferred form which is here illustrated the wrench of the invention has a straight bar handle 10, preferably about 8 or more inches long, carrying at its head a cross bar 12 which is curved away from the handle, as if the top of a T were curved upward into about a quadrant; and this has the two prong lugs 14, 16 of the spanner, these being upward projections at the ends of the quadrant bar 12. These lugs 14, 16 are preferably alike, so that the wrench can operate in either direction without being turned around; but that prong which is illustrated in position to be the work lug is marked 14, and that prong which is illustrated in position to be the fulcrum lug is marked 16. These prongs extend somewhat radially toward the axis of the quadrant bar which is the general region where the axis of any coupling will be, to which the wrench may be applied; and as seen in profile in Figures 1–3, each is shaped with an acute angled toe 13 constituting a claw-lug pointing toward the other lug. This shape is formed by providing the end surface with clearance, like the back of a cutting tool, so that this end surface does not contact the bottom of the coupling slot in any way that prevents the toe edge 13 of this surface from reaching the bottom of any slot 20, when inserted, by scarfing the outward side 15 of the lug if necessary for the top of the lug to enter the slot with comfortable play room; and by under cutting the inward side of the shank of the spanner lug to a plane as at 17, converging in a taper with the outward side to the base of the salient toe, so that, when the toe 13 is engaged against the bottom of that slot-wall, all of this side except its edge at the toe 13 has clearance from that side wall of the slot which constitutes the sunken lug 20. The sides of these lugs 14, 16, which face each other are oblong in the direction parallel to the axes of the couplings they are to serve, as seen in Figure 5. If the head bar 12 is made in the concave form illustrated, the lugs 14, 16 do not necessarily project nearly so far as is illustrated, but only enough for the bridging of the head bar between them to avoid contact with the coupling in the smallest size of coupling. The greater clearance provided by the ⅝ inch height which is illustrated may be preferred by some persons because it enables the inner face of the lug, seen in Figure 5, to have a radial recess 18 long enough to receive the whole height of a half inch pin, when the spanner is used on a coupling of Pin-lug type (not shown).

The peripheries of the Navy couplings in sizes ranging between those called 1½ inch and those called 4 inch, have actual dimension ranging between 3 inches and 6⅜ inches, according to standard Navy specifications, 34F3 (INT); the slots are 60° apart in the smallest and 45° apart in the larger sizes; and the peripheral curvatures of the couplings differ correspondingly. A peculiar utility of the invention is that a single wrench having a spread of 2¼ inches between lugs 14 and 16 can have its claw lug 14 engaged against a sunken lug 20 of the smallest coupling in said range, or of the largest coupling, or of any size in between, and in all cases its other lug 16 will rest operatively as a fulcrum with approximately perpendicular pressure on a near-by part of the periphery. On the largest size this will fall freely into the first slot 41. On all others it will lodge on that land 22, 32, or 42 which is second from the engaged sunken lug 20, and will avoid becoming cramped in the slot 23, 33, which is just beyond this land, the slots here being 60° or 45° apart. A spread of 2⅛ inches is preferred, because slight casual variations may occur in the construction and locations of the coupling slots; and wrenches of smaller spread between lugs will be found useful if such are desired.

The said radial recess 18 in the face of each lug 14, 16 enables either lug to engage couplings of the Roll-pin lug type; the oblong made by the abutments 19 of the plane inward faces, each side of that hollow, adapt each lug for engaging broad coupling-lugs of the Slidewell lug type; and the terminal acute angular toes left by the lug undercuts 17 adapt each lug for hooking into the undercut part of the broad lugs of the Rocker-

lug type. By making the bridge between lugs 14 and 16 on a curvature, material is saved and strength is gained. In the specimen which is being illustrated this curve is on a radius of about 2½ inches. The back side of each lug 14, 16 is shown scarfed at 15 to make the tip of each be thin enough to go into any of the Navy-prescribed sizes of slots. By making the spanner lugs 14, 16 alike, and mutually opposed, the wrench can be applied in whichever way it may happen to come to hand; and can be operated by push or by pull as may be convenient, to turn any coupling in either direction from substantially a single position of the wrench.

When the illustrated spanner is applied with either lug entering any slot in a Navy coupling, to be the working lug, for example, as 14 in Figures 1, 2 and 3, and the other lug 16 is rested on the peripheral surface as a fulcrum wherever it may happen to fall, application of power to the handle will primarily secure the wrench on the coupling by pressing its fulcrum lug 16 so directly toward the center of the coupling that it cannot slip; and thereby the claw work lug 14 becomes locked down at the base of the sunken lug 20 of the coupling. The handle then constitutes a capstan bar, with most favorable leverage effect so that so long as the power continues that tends to turn the coupling about the axis of the coupling. A slight backward movement of the handle frees the wrench from the coupling.

Thus the invention provides a single tool, of fixed size, which will fit and operate any sunken lug hose coupling within the said range of sizes; and also will operate any couplings having lugs of the other types named, in their commercial range of sizes, in which the coupling lug is an exterior projection.

I claim as my invention:

A spanner wrench for turning any hose coupling in a range of varying types and sizes, these being hose couplings each of which has a smoothly circular peripheral surface, but with sunken lugs of Navy slot type in the range of one and a half inches to four inches nominal sizes or with exterior eminence lugs of pin, roll pin, rocker or Slidewell type, said sunken lugs being radial side walls of superficial slots that are spaced regularly around said peripheral smooth surface separated by lands of arcuate length exceeding the slot-width; said wrench being the combination of a handle, a quadrant bar and two prong-lugs which extend from the ends of the quadrant approximately radially toward the axis of the quadrant—characterized by this, that each prong has a radial length exceeding the height of every eminence lug of the couplings which are in the said range; each prong embodying in the said radial length a claw-lug, being an acute-angled-edged terminal toe of the prong, salient toward the other prong for engaging a sunken lug of a hose coupling, a plane-surfaced shank facing said other prong, and a radial recess in said plane and salient surfaces having breadth adapted to engage an eminence lug of a hose coupling; the back side of the prong having a surface converging with said plane of the face side and extending behind the claw-lug; the end surface of the prong, being the outer side of said salient, comprising a straight sequence of two parallel-sided oblongs, separated by the said radial recess, these oblongs being thin enough to enter the smallest size of slot in Navy slotted couplings in said range; combined with this, that the length of the span between the two toes is such as exceeds the total arcuate dimension of one land plus one groove, in every sunken lug coupling in said range of sizes, except the largest size of those couplings, and is less than the total arcuate dimension of two lands plus their intervening groove in the smallest of those couplings; whereby, when the wrench is applied to any coupling in said range, either of the said claw-lugs can operatively engage any lug of that coupling, and the other prong, to act as a fulcrum, can engage on a peripheral surface thereof and will always avoid becoming cramped in any slot thereof.

CLIFFORD H. BARKER.

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