Aug. 12, 1958 C. T. BROWN 2,846,910

WRENCH INCLUDING INTERNALLY THREADED SPLIT RING

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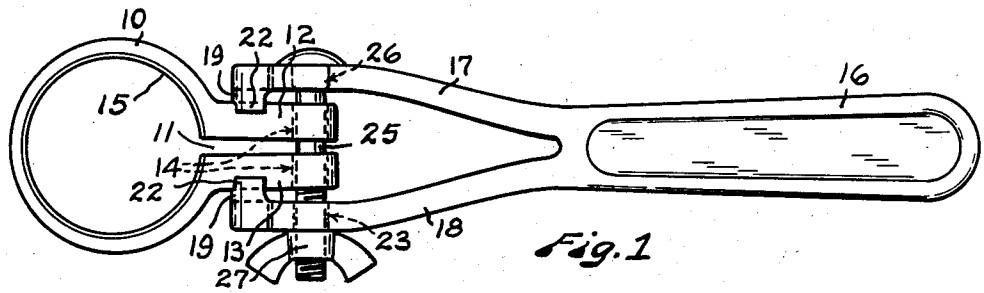


Fig. 1

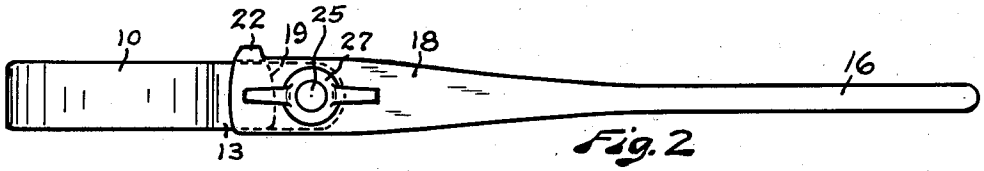


Fig. 2

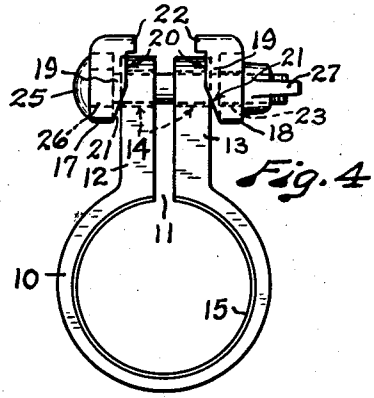


Fig. 4

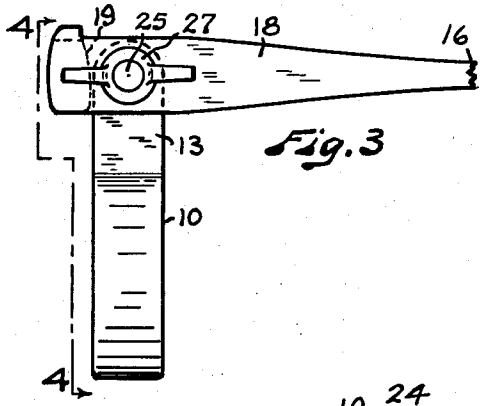


Fig. 3

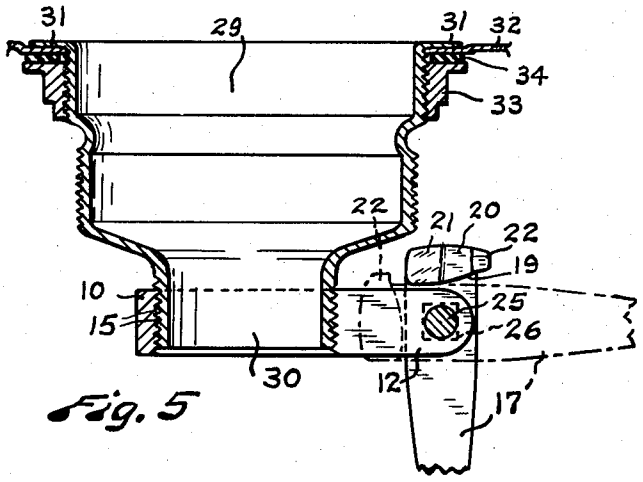


Fig. 5

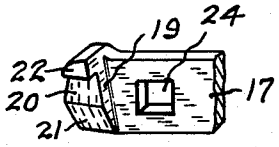


Fig. 6

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WRENCH INCLUDING INTERNALLY THREADED SPLIT RING

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1 Claim. (Cl. 81—64)

This invention relates to a clamp type wrench for cylindrical objects and an object of this invention is to provide a clamp type wrench which is particularly well adapted for gripping and holding cylindrical parts of sink strainers and like fittings used in connection with plumbing.

Another object of this invention is to provide a simple and efficient clamp type wrench in which angular movement of a handle relative to a one piece resilient self expanding split clamping ring will contract said clamping ring onto a cylindrical object which is to be held against rotation.

Another object of this invention is to provide a clamp type wrench comprising a one piece resilient self expanding split clamping ring adapted to be applied to a cylindrical object and having a handle pivotally connected therewith, said handle being movable into a position substantially parallel to the axis of the clamping ring to facilitate quick and convenient application of the ring to the object and being movable into an efficient holding position substantially in the plane of the clamping ring and at right angles to the axis of the object after the clamping ring has been applied to the object.

Another object of this invention is to provide a wrench comprising a one piece resilient self expanding internally threaded split ring clamping member applicable to an externally threaded cylindrical object without damaging the threads of the object and having a handle pivotally connected therewith, said handle having stop means preventing pivotal movement of the handle in one direction beyond a position substantially coincident with the plane of the clamping ring.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings.

Fig. 1 is a top plan view of a clamp type wrench constructed in accordance with this invention.

Fig. 2 is an edge view of the same.

Fig. 3 is an edge view of this clamp type wrench with the handle positioned substantially at right angles to the plane of the clamping ring and with part of the handle broken away.

Fig. 4 is an elevational view looking in the direction of broken line 4—4 of Fig. 3.

Fig. 5 is a sectional view showing this tool applied to a sink strainer, one position of the handle being shown by full lines and another position being shown by dot and dash lines.

Fig. 6 is a detached fragmentary perspective view showing cam and stop means on the end portion of one of the resilient arms of a forked handle.

Like reference numerals indicate like parts throughout the several views.

This clamp wrench comprises a one piece resilient self expanding split clamping ring 10 having a single slot 11 extending from the inside to the outside thereof and having two similar integral lugs 12 and 13 of substantial length extending outwardly therefrom on opposite sides

of the slot 11. Preferably the outer ends of the lugs 12 and 13 are rounded and suitable transverse aligned perforations 14 are provided in said lugs near the outer ends thereof. The split clamping ring 10 is made of resilient metal and the wall of said ring is thinner at a location substantially opposite to the slot 11 and is of uniformly increasing thickness toward the lugs 12 and 13. The split ring 10 is provided with internal threads 15.

A handle 16 is forked at one end to provide two divergent resilient arms 17 and 18. The arms 17 and 18 fit over and receive therebetween the two lugs 12 and 13. The tip portion of each handle arm 17 and 18 is provided on its inner side with a cam 19 having a flat surface 20 and an inclined surface 21. Also the tip portion of each handle arm 17 and 18 is provided with an overhanging stop member 22. The two handle arms 18 and 17 are further respectively provided with aligned perforations 23 and 24 which receive a clamp bolt 25. Preferably one of the perforations, such as the perforation 24, is square or non-circular in shape and receives a correspondingly shaped part of the bolt and prevents the bolt from turning in the holes 23 and 24. The non-circular or square part of the bolt 25 is indicated by 26. A thumb nut 27 which is adjustable manually is provided on the threaded end part of the bolt 25.

As illustrative of one use for which this clamp wrench is well adapted Fig. 5 shows this wrench applied to a sink strainer of conventional form. The sink strainer comprises an upper bowl part 29 of fairly large diameter and an externally threaded lower part 30 of smaller diameter which receives this wrench. The bowl part 29 has an outwardly extending annular top flange 31 which rests within a sink 32. A fragment of the bottom of this sink is shown in Fig. 5. The bowl 29 is clamped to the sink by a nut 33 which screws onto an externally threaded part of the bowl and tightens against a gasket 34 to provide a leak tight joint. It is necessary to hold the strainer 29, 30 against rotation while the nut 33 is being tightened in assembly or installation and also while said nut is being loosened in dis-assembly.

The externally threaded lower discharge parts 30 of sink strainers of this type are of fairly uniform size and after the thumb nut 27 of the wrench has been adjusted properly for one of these parts 30 it usually will not need more adjustment for like parts of other sink strainers. Thus the wrench can usually be applied with the handle 16 in the position shown by full lines in Fig. 5 and the clamp ring 10 tightened sufficiently to hold the strainer by merely moving the handle upwardly into the position shown by dot and dash lines in said Fig. 5.

This wrench is applied to an externally threaded strainer part 30 by positioning the wrench handle 17 approximately at right angles to the plane of the ring 10, this being the position in which it is shown in Figs. 3 and 4 and by full lines in Fig. 5. Positioning the handle 16 at right angles to the plane of the clamp ring 10 disengages the cams 19 from the lugs 12 and 13 and allows the resilient, self expanding clamp ring 10 to expand enough so that it can easily be screwed onto the strainer part 30. After the clamp ring 10 has been screwed onto the strainer part 30 into a position approximately as shown in Fig. 5 the handle 16 is angularly moved upwardly into the dot and dash line position in which it is substantially in the plane of the clamp ring 10. This upward pivotal movement of the handle causes the inclined portions 21 of the cams to press against the lugs 12 and 13 and move these lugs toward each other thus contracting the clamp ring 10 on the strainer part 30. When the handle 16 is positioned substantially in the plane of the clamp ring 10 the flat portions 20 of the cams will be in engagement with the lugs 12 and 13 and will hold the clamping ring 10 in a contracted or clamp-

ing position on the strainer part **30**. With the clamp ring **10** thus clamped on the part **30** the sink strainer **29**, **30** is easily held against rotation while the nut **33** is tightened or loosened, as desired. The threads **15** in the clamp ring **10** interfit the external threads on the strainer part **30** and avoid damage to the threads on part **30**.

The provision of the cams **19**, **20**, **21** saves much time in applying and disengaging the wrench as it is not ordinarily necessary to adjust the nut **27** in order to obtain the desired clamping. Mounting the handle **16** so that it can be positioned substantially parallel to the axis of the sink strainer **29**, **30** and close to this axis makes it possible to apply this wrench in many instances where there are obstructions, such as walls, near the strainer and which obstructions could be in the way of the handle **16** and make it impossible to screw the clamp ring **10** onto the strainer part **30** if the handle could not be thus folded. The part of the clamp ring **10** opposite to the lugs **12** and **13**, being of reduced cross sectional area, makes the clamp ring easier to contract. The handle arms **17** and **18** are fairly resilient and can readily be flexed toward and away from each other by manually tightening the nut **27**. The lugs **12** and **13** are of substantial length and the tip portions of the handle arms extend well beyond the bolt **25** and the cams operate between the bolt **25** and the clamp ring **10**. Obviously the cam on one handle arm could be dispensed with and the other cam would still contract the clamping ring. However the use of two cams is preferred as it provides better balance of the contractile forces and smoother operation and more contraction of the clamp ring **10**.

When the clamp ring **10** is on a strainer part **30** the ring is held against tilting movement, usually with its axis substantially vertical. While the ring is being applied to the strainer part **30** the handle **16** is desirably inclined, at least enough to free the cams from the lugs **12** and **13**, and said handle is preferably held in a position approximately at right angles to the plane of the clamping ring while the ring is being screwed onto the part **30**. The stop members **22** prevent the handle from being pivotally moved upwardly substantially beyond the plane of the clamp ring **10** and this has been found to contribute to convenience and smoothness and ease and efficiency of operation of the tool.

The foregoing description and accompanying drawings clearly disclose a preferred embodiment of this invention but it will be understood that changes in this device may be made within the scope of the following claim.

I claim:

In a clamp wrench for application to an externally threaded cylindrical member, an internally threaded self expanding split clamping ring of resilient metal having a slot extending from interior to exterior thereof; two spaced apart lugs rigidly connected with said clamping ring externally of the ring and on opposite sides of the slot adjacent the slot; a forked handle terminating at one end in two spaced apart resilient arms spanning said two lugs and receiving said two lugs therebetween; a clamping bolt extending through said handle arm and said lugs and having an adjustable nut thereon, said bolt pivotally and contractably connecting the handle and the clamping ring, said handle and clamping ring being relatively angularly movable between a position in which they are approximately in a common plane and a position in which they are substantially at right angles to each other; stop means limiting relative angular movement of said handle and clamping ring in one direction beyond a position in which they are substantially in a common plane; and cam means provided between at least one handle arm and the lug adjacent thereto, said cam means including an inclined ring tightening surface extending part way across the face of the handle arm and a flat holding surface extending beyond the inclined ring tightening surface, said cam means releasing said clamping ring expansively when the handle and clamping ring are substantially at right angles to each other and contracting said clamping ring when the handle and clamping ring are substantially in a common plane in prolongation of each other and with the handle extending away from the ring.

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