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2,628,811

TOOL FOR CLOSING AND OPENING CONTAINERS OF THE
METAL DRUM OR BARREL TYPE

Filed Sept. 2, 1948

2 SHEETS—SHEET 1

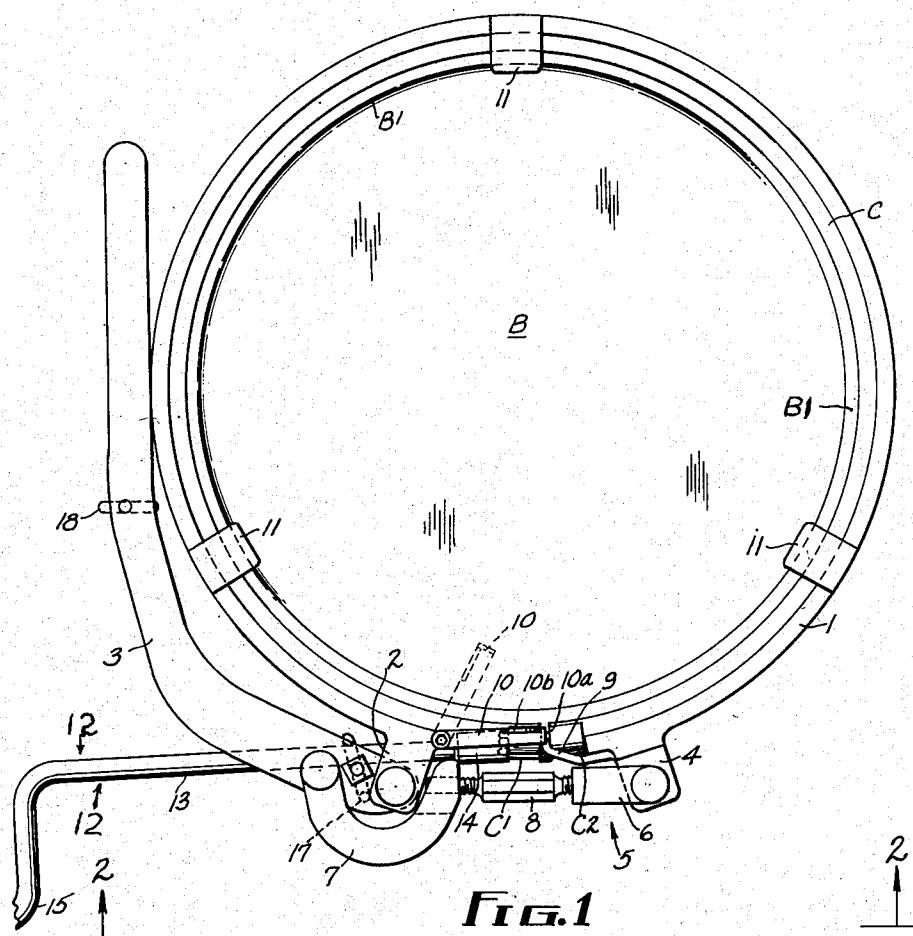


FIG. 1

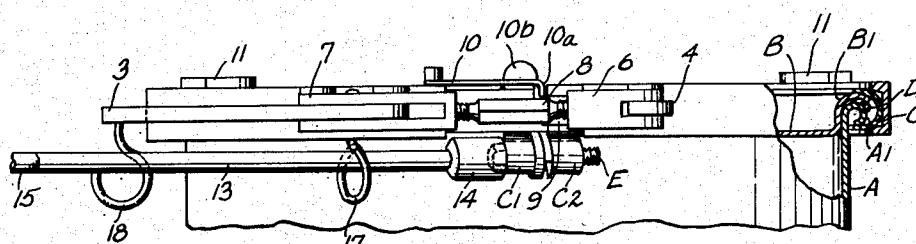


FIG. 2

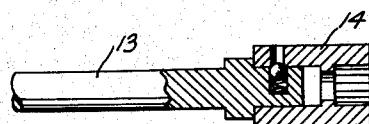


FIG. 3

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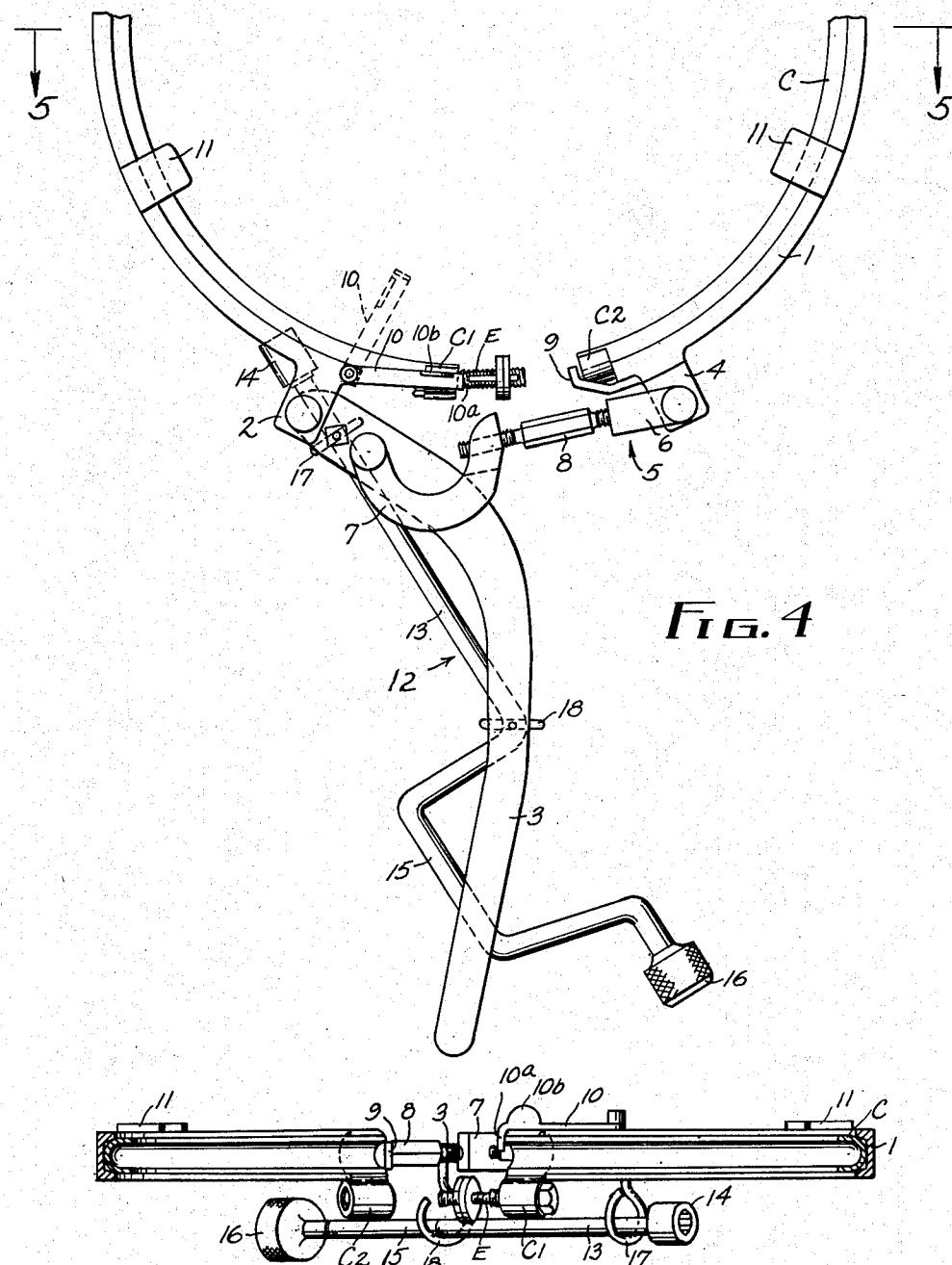


FIG. 5

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UNITED STATES PATENT OFFICE

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TOOL FOR CLOSING AND OPENING CONTAINERS OF THE METAL DRUM OR BARREL TYPE

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Application September 2, 1948, Serial No. 47,497

5 Claims. (Cl. 254—79)

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The invention relates to appliances or tools for manipulating the closure securing means of metal drums or barrels.

The body part of such metal containers commonly has an end opening defined by an outwardly extending bead at the top edge of the container side wall and is fitted with a flanged closure for the opening. The closure usually is secured to the body by a transversely split clamping ring formed of a metal strip of channel cross section and fitted with a threaded tightening bolt that engages apertured projections or lugs that depend from the adjacent ends of the split ring, the bolt fitting loosely in one of the projections and having its threaded stem operatively engaging internal threads in the other projection. In applying the clamping ring to a container it is necessary first to force the ends of the ring apart to expand it so that it will pass over the bead of the container and the flange of the closure and then to draw the ends of the ring together so that it tightly clamps the flange of the closure to the bead of the container, usually with a sealing gasket of rubber or the like interposed between the flange and bead.

It is an object of the present invention to provide a tool adapted both to expand the clamping ring of a container to facilitate its application to the container (or its removal therefrom) and to compress the ring and facilitate locking thereof by its threaded bolt or other tightening means.

A further object of the invention is to provide a tool for the performance of the above noted functions which is of simple construction and susceptible in use of easy and rapid manual operation so as to reduce the labor cost of closing and opening containers.

For the attainment of the above stated and other incidental or auxiliary objects, the invention consists in certain forms, arrangements, and combinations of parts hereinafter described in connection with the accompanying drawings and particularly pointed out in the appended claims.

In the drawings,

Fig. 1 is a plan view showing the tool of the present invention applied to a metal drum.

Fig. 2 is a side elevation of the tool shown in Fig. 1 and of the upper portion of the metal drum, a part of the tool and drum at the right side of the figure, being broken away to disclose some of the structure in section.

Fig. 3 is an enlarged fragmentary view in section of the wrench device preferably combined with the tool and designed to rotate the screw bolt of the clamping ring of the metal container.

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Fig. 4 is a plan view of the improved tool applied to the clamping ring of the metal drum and showing both the tool and the clamping ring in expanded form preliminary to applying the clamping ring to the metal container of which it constitutes a part.

Fig. 5 is a section taken on the line 5—5 of Fig. 4, and showing parts of the tool and container clamping ring in elevation.

As shown in Fig. 2 of the drawing, the reference character A designates the open topped body part of a sheet metal drum while the character B designates the closure thereof. Body A has its upper edge turned outward to form a bead A₁ and closure B has its periphery formed with a flange B₁ shaped to engage the inner surface of body A and the top of bead A₁. A transversely split clamping ring C of channel cross section engages the bead A₁ and the flange B₁ to secure them together with an interposed sealing gasket D of rubber or the like. The clamp-ring C is fitted at its two ends with depending apertured lugs C₁ and C₂ which are engaged by the threaded clamping bolt E to contract and secure the clamping ring in known manner, the clamping bolt E having loose engagement with lug C₁ and threaded engagement with the lug C₂. The clamping bolt may be of suitable known construction but that shown in the drawing is of the improved form claimed in my copending application, Serial No. 47,498, filed September 2, 1948.

From an inspection of Figs. 1 and 2, it will be apparent that in applying the clamping ring C to the container to secure the closure thereof, it is desirable to spread the ends of the ring so as to expand it and permit it to pass over the flange B₁ of the closure and the bead A₁ of the drum. This operation is readily effected by means of the improved tool.

The tool comprises a transversely split band 1, preferably of channel cross section as shown in Fig. 2. Adjacent one of its ends band 1 is provided with a rigid lug 2 to which is pivotally connected a manual lever 3. The other end of band 1 is similarly fitted with a lug 4 which is connected to lever 3 by a link structure generally designated by the numeral 5. This link 5 comprises a part 6 pivotally connected to lug 4, a part 7 which is pivotally connected to lever 3, and an elongated part 8 having its middle section of angular cross section and its two ends formed respectively with right hand and left hand screw threads which operatively engage threaded holes in the parts 6 and 7 so that the part 8 serves as a turn buckle to adjust the length

of link 5. The purpose of this adjustment will presently appear.

One end of band 1 is fitted with an inturned expander lug 9 adapted to engage one end of the clamping ring C in the manner indicated in Fig. 1. The other end of band 1 is fitted with a finger 10 which is pivotally connected to the band to swing on an axis parallel to the axis of the band so that it can be swung inward, as indicated by dotted lines in Fig. 1. Finger 10 is formed with a downwardly extending expander lug 10a which is adapted to engage the adjacent end of clamping ring C. Finger 10 also has an upstanding lug 10b to facilitate its manual adjustment. Band 1 is further provided with a plurality of inwardly extending lugs 11, 11 which are designed to engage clamping ring C and position the band in relation to the ring when the band is made to embrace the ring in the manner indicated in Figs. 1 and 2.

The tool is preferably fitted with a socket wrench generally designated by the numeral 12. The wrench comprises a stem 13 and detachable socket 14. The stem is bent to form an actuating crank 15, and is fitted with a rotatably mounted hand grip 16. The wrench 12 is suspended from the manual lever 3 of the tool by a ring 17 and hook 18, the ring 17 having its stem swiveled in lever 3, while hook 18 is rigidly secured thereto.

Understanding of the operation of the tool will be facilitated by comparison of Figs. 1 and 4 of the drawing. In Fig. 1, with the manual lever 3 in one of its two extreme positions generally parallel to band 1, the three pivotal connections of the lever and the link 5 are nearly on the same straight line but the pivotal connection of the lever 3 to lug 2 is disposed slightly outside of the line through the two other pivotal connections so that the elastic expansive force of both band 1 and the clamping ring C serve to lock the lever in the position shown. In this position the lugs 9 and 10a carried by band 1 engage the adjacent ends of clamping ring C. Consequently, when lever 3 is moved from the position shown in Fig. 1 toward the position shown in Fig. 4, the ends of band 1 are forced apart and with them the ends of clamping ring C. In the extreme open position shown in Fig. 4 the three pivotal points of lever 3 and link 5 are again nearly in line so that very little pressure on lever 3 suffices to hold the band 1 and ring C in their expanded form.

In the initial use of the improved tool when it is desired to apply a clamping ring to its container, the band of the tool is expanded (by movement of lever 3) as much as may be needed to permit the channel section of the band to pass readily over the ring. The tool band 1 is then contracted by moving lever 3 to the position shown in Fig. 1, whereupon, turn buckle 8 is adjusted, if necessary, so that with lug 9 engaging one end of ring C the other end of the ring is positioned so as to permit the pivoted finger 10 to move into the full line position shown in Fig. 1 where its lug 10a is in alignment with and can engage the other end of ring C. This adjustment of the length of the link 5 is facilitated by having the lug 10a on the pivotal member 10, since the member 10 can be swung to the dotted line position shown in Fig. 1 to avoid interference between lug 10a and clamping ring C and permit the required concentric nesting of the clamping ring and the tool band during the process of adjustment of the length of the link.

The movable mounting of lug 10a may also facilitate disengagement of the tool from the clamping ring, as will later more fully appear. It will be understood that when once the adjustment 5 of link 5 has been made no further adjustment is required for its use on any number of clamping rings of containers of the same size.

The adjustment of the tool having been effected, it will be seen that in closing a container the band 1 of the tool is applied to the container clamping ring by moving lever 3 to somewhat expand band 1 while the band is passed over the clamping ring. Thereupon, with the band circumferentially positioned to permit engagement of its lugs 9 and 10a with the respective ends of the clamping ring, lever 3 is again moved in the expanding direction to expand the clamping ring sufficiently to permit it to readily pass over the closure flange B1 and bead A1 20 of the container. Lever 3 is then moved to the fully closed position shown in Fig. 1 so as to compress the clamping ring C and bring its lugs C1, C2, sufficiently close together to permit engagement of the clamping bolt E with the threaded lug C2. The wrench 12 may then be conveniently used to turn the bolt E and effect complete closure and locking of the clamping ring C. To do this the wrench is disengaged from hook 18 so that the stem 13 of the wrench can 25 be swung about the axis of loop 17 to the tangent position shown in Fig. 1, permitting proper engagement of the wrench socket with the head of bolt E. Said bolt having been tightened, the wrench is swung to engagement with the suspension hook 18. Thus the wrench is always 30 maintained in convenient position for quick and efficient use in the closing of a container. The clamping ring having been tightened in the manner stated, the tool is removed from the container by first swinging finger 10 to its inoperative position shown by dotted lines in Fig. 1 to disengage its lug 10a from the end of ring C, and then moving lever 3 to expand the tool band enough to release it from the clamping ring.

In the use of the tool to open containers, the band of the tool is expanded to pass over the container clamping ring in proper position circumferentially to have its lugs 9 and 10a engage the ends of the ring. At this time the finger 10 of the band may, if necessary, be swung to the dotted line position shown in Fig. 1. Then with the tool band fully contracted (as shown in Fig. 1) the wrench 12 is used to loosen and disengage the clamping screw E, the clamping tool serving meanwhile to reduce the tension on the clamping screw and minimize wear on the screw threads. Of course the tool performs this latter function also during the closing of containers. Next, with the lugs 9 and 10a engaging the ends of ring C, the tool lever 3 is moved to expand the tool band and clamping ring to permit easy removal of the ring from the container.

It will readily be understood that the improved tool can be used successfully with container clamping rings differing in construction more or less from that which has been illustrated herein and also that the tool which has been shown and described may be modified in various respects without departing from the invention as defined in the appended claims.

What is claimed is:

1. In a tool for applying and removing the transversely split closure clamping rings of metal containers, the combination of a transversely

split band constructed to surround circumferentially and separably engage such a closure clamping ring; expander means carried by the end portions of the band constructed to operatively engage transverse surfaces of the end portions of a clamping ring for exerting expanding force on the ring; and manually operable means movably connected to the end portions of the tool band and operable, when the tool is applied to a clamping ring with the expander means operatively engaging transverse surfaces of the end portions of the ring, to positively expand the band and the ring and alternatively operable to contract the tool band and the ring.

2. A tool as claimed in claim 1 in which the means carried by the tool band for engaging the end portions of a clamping ring comprise lugs that extend transversely of the band to engage the transverse end surfaces of the clamping ring.

3. A tool as claimed in claim 2 in which one of the lugs has a movable connection with an end portion of the tool band for movement into and out of alignment with the adjacent end of a clamping ring with which the tool is operatively engaged.

4. A tool as claimed in claim 1 in which the same manually operable means act by one movement thereof to expand the tool band and a

clamping ring with which the band is operatively engaged and by another movement to contract the band and the clamping ring.

5. A tool as claimed in claim 1 in which the manually operable means at the ends of their band-expanding and band-contracting movements have their parts in position in relation to each other to be yieldingly held in such positions by the elastic contractual force and the elastic expansional force, respectively, to which the band is subject.

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