July 14, 1942. C. C. GROTNES 2,289,422

BARREL COVER CLAMP

Filed Oct. 9, 1939

Fig. 1

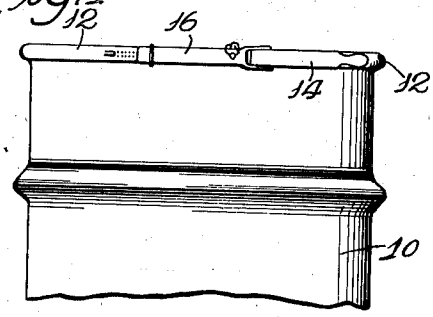


Fig. 2

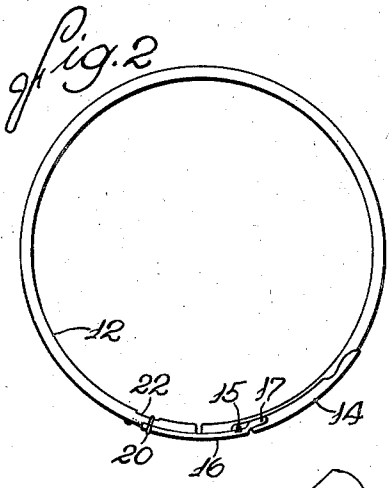


Fig. 3

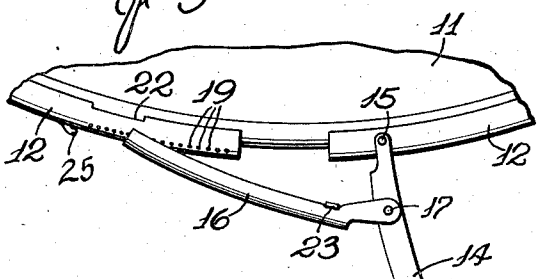


Fig. 5

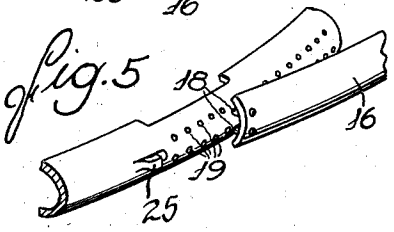


Fig. 4

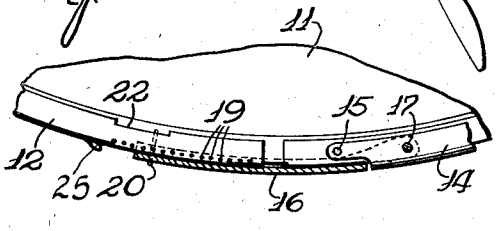
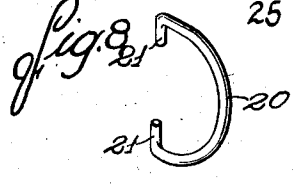


Fig. 6

Fig. 7

Fig. 8



INVENTOR

Carl C. Grotnes

By Parker, Carlton, Pitzner & Hubbard

ATTORNEYS

Patented July 14, 1942 2,289,422

UNITED STATES PATENT OFFICE

2,289,422

BARREL COVER CLAMP

Carl C. Grotnes, Park Ridge, Ill., assignor of one-half to George G. Cuttner, Chicago, Ill.

Application October 9, 1939, Serial No. 298,556

3 Claims. (Cl. 220—61)

The invention relates to a novel form of sealing and clamping device for steel drums or barrels of the type in which the usual removable head or cover is provided with a marginal flange overlying a bead on the end edge of the barrel. To hold such a cover in place, a split ring or hoop of channel-shaped cross section is applied so as to encircle the barrel bead and the overlying cover flange. The present invention contemplates the provision of a novel form of mechanism for contracting the hoop or ring so as to insure a tight seal about the entire perimeter of the barrel head.

One object of the invention is to provide such a device with the parts constructed and arranged so as to present a minimum lateral protrusion from the side of the barrel, while also leaving the head entirely free of obstruction, so that it will not interfere in any way with stacking or handling of barrels provided with such devices.

Still another object is to provide a device of the character indicated incorporating a novel construction and arrangement of parts by virtue of which strength and ruggedness of construction, as well as highly advantageous leverage ratios for operation are combined with extreme economy of manufacture.

Further objects and advantages of the invention will become apparent as the following description proceeds, taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevation of the upper portion of a barrel provided with a clamping device embodying the invention.

Fig. 2 is a plan view of the clamping device.

Fig. 3 is an enlarged fragmentary plan view of the clamping device applied to the barrel of Fig. 1, illustrating the mode of tensioning the clamping ring.

Fig. 4 is a view similar to Fig. 3 but with the ring tensioning parts in retracted position and shown partially in section.

Fig. 5 is a detail perspective view of the nose portion of the pawl and cooperating abutment structure on the clamping ring.

Fig. 6 is an enlarged fragmentary perspective view of the clamping mechanism in its retracted or clamped position.

Fig. 7 is a transverse sectional view along the line 7—7 of Fig. 6.

Fig. 8 is a detail perspective view of a spring clip included in the device.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail, the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In the exemplary construction, a clamping device embodying the invention has been shown as applied to a steel barrel 10 of conventional form (Fig. 1) having the usual cover 11 (Fig. 3) fashioned at its marginal edge to overlie a bead at the upper edge of the barrel. The clamping device includes a hoop or split ring 12, which is of semicircular or channel-shaped cross section (Fig. 7) in order to embrace the barrel head and overlie the edge of the cover to clamp them together when the hoop is contracted. The hoop may be of substantially non-resilient sheet metal, such, for example, as hot rolled steel.

To draw the hoop 12 tight about the barrel head, a novel form of hoop-tensioning mechanism has been provided. It includes a hand lever 14 (Fig. 3) pivoted by pins 15 fixed in opposite side walls of the hoop adjacent one end of the latter to swing in the plane of the hoop. This lever is also fashioned of sheet metal and is shaped and dimensioned to fit snugly about the hoop when in its retracted or depressed position (Fig. 2). At its inner end the center or crown portion of the lever 14 is cut away (Fig. 3) to form a yoke-shaped end with the legs of the yoke connected to the ring by pivot pins 15 so that full and free swinging movement of the lever is permitted.

Intermediate the ends of the lever 14 and closely adjacent its pivots 15 is pivoted a pawl 16 by pins 17 in the side walls of the lever. Like the lever 14, this pawl is fashioned of sheet metal and is of suitable cross section and longitudinal curvature to conform to the periphery of the hoop 12 and fit snugly about it when in its retracted position (Fig. 4). Also like the lever 14, the pivoted end of the pawl is cut away at its central or crown portion to form a yoke-shaped end, the legs of which are attached by the pins 17 to the lever 14. This yoke cut-out on the pawl is deep, however, not only to permit freedom of swing for the pawl, but also, and more important, so that when the pawl and lever are retracted they can lie snugly along the ring periphery with their central or crown portions in longitudinal alinement and without any overlapping of the same.

Operative engagement between the pawl 16 and the hoop 12 is effected by means of teeth prefer-

ably in the form of a pair of hardened steel pins 18 (Fig. 7) fixed in the outer end of the pawl and projecting inwardly toward the hoop. These pins are positioned to engage a complemental series of abutments spaced circumferentially of the hoop and located on the end portion thereof opposite that to which the lever 14 is pivoted. In the present instance these abutments are formed by the walls of holes 19 fashioned in the hoop and dimensioned to receive the pins 18. By using a plurality of closely spaced abutments the take-up can be effected in small incremental steps so as to insure a tight fit of the hoop despite discrepancies of barrel or hoop diameters from standard sizes. Additional tightening as may be required is also made possible by this small step take-up.

To prevent skewing or twisting of the hoop 12 when it is placed under tension, the holes 19 are located in two rows lying on opposite sides of the median plane of the hoop. In this way the tensioning force applied to the hoop, by engagement of the pawl 16 with the holes 19, is equally distributed on opposite sides of the hoop's median plane so that there is no tendency to distort it. Also, this arrangement of a plurality of transversely alined holes, as compared to a single wide slot, gives maximum hoop strength, particularly in view of the uninterrupted central portion of the hoop through which tension is transmitted.

In the operation of the device the hoop 12 is slipped into position on the barrel 10 and the lever 14 is swung outward into a position like that of Fig. 3 in which the pawl teeth 18 can engage one of the pairs of holes 19. The lever 14 is then swung back toward its retracted position (Fig. 4), thereby drawing together the ends of the hoop. This operation may, if necessary, be repeated a number of times with an advance of the pawl teeth 18 to successive sets of holes 19 at each actuation of the lever. Since the hoop 12 is substantially non-resilient, it will not spring out when released by the pawl in the interval between successive actuations. The frictional grip or binding of the loop on the barrel also aids in holding it in place during this interval.

Of particular importance in the construction of the device is the fact that the pivotal connection 17, between the pawl 16 and lever 14, is located closely adjacent the lever pivots 15. This relation is, first of all, possible because of the close spacing of the holes 19 circumferentially of the hoop. In other words, the close spacing of the holes makes possible short strokes of the hand lever in effecting the short take-up steps in tightening the hoop. Such a short stroke or throw for the hand lever and pawl makes it possible to place the pawl and lever pivots close together. On the other hand this relation of the pivots makes it possible to accomplish several important improvements in operation so that a close correlation exists between the structural features noted. First, the tensioning force applied to the hoop 12, through the pawl 16, is along a line lying very close to the periphery of the hoop so that there is no tendency to pull the end of the hoop which is engaged by the pawl, away from the barrel. In this way a firm and effectual clamping of the hoop against the barrel is effected throughout the length of the hoop. Second, the operator is afforded a very good lever advantage since the portion of the lever 14 beyond the pivot 17 is much greater than that lying between the pivots 17 and 15. Third, this close proximity of the pivots 17 and 15 makes it possible, with reasonably short yokes on the ends of the pawl and lever, to locate the pawl and lever in longitudinal alinement along the hoop periphery when they are retracted (Fig. 4), while at the same time retaining the advantages of strength and ruggedness of construction resulting from the use of a channel-shaped pawl 16 as distinguished from say a pair of separate pawl links pivoted in spaced relation on opposite sides of the lever 14.

To hold the pawl 16 against accidental lateral displacement after the clamping operation is completed a spring clip 20 is provided (Figs. 6, 7 and 8). This spring clip may be fashioned from resilient wire and its inwardly bent ends 21 are received within slots 22 formed in the inner edges of the hoop 12.

Means is provided for sealing the clamping ring when in place in order to show, by breakage of the seal, any unauthorized opening of the barrel. To this end a lug 23 (Fig. 6) is extended from the side of the pawl 16 and has in it a hole registering with a corresponding hole in the underlying pivot pin 15. A sealing wire 24 is inserted through these registering holes.

In order to remove the clamping hoop or ring 12 from the barrel, the pawl 16 is also utilized. For this purpose a lug 25 (Fig. 6) is struck out from the hoop. To free the hoop, which, being non-resilient, might otherwise stick in place on the barrel, the lever 14 is elevated to shove the nose of the pawl 16 forward against the opposed abutment face presented by the lug 25. The lever 14 is then pressed forward still farther (clockwise as viewed in Fig. 3), thereby positively expanding the hoop to force its ends apart.

That the parts of the mechanism are few in number and simple in shape will be clear from the foregoing. One prime virtue of the shapes used is that the principal parts, including the hoop 12, the lever 14, and pawl 16, can all be formed by simple rolling operations as distinguished from the use of expensive forming dies. The holes 19 is the hoop, and other necessary apertures, can be formed in the material while it is flat. After having thus been preliminarily formed, the parts are shaped through the use of suitable rollers to give them their necessary channel or semicircular cross sectional shape, as well as longitudinal curvature.

The device herein disclosed is characterized by its extreme compactness when in place on a barrel. By virtue of the fact that the lever 14 and pawl 16 are disposed in non-overlapping relation when retracted (Fig. 4), as described above, a maximum of two thicknesses of metal is presented in a lateral direction so that there is very little protrusion from the side of the barrel. Additionally, it will be seen that none of the parts of the device overlie the head of the barrel so that there is no interference whatever with barrel stacking.

I claim as my invention:

1. In a device of the type described for clamping a head on a barrel, the combination of a split ring of channel shaped cross section, a pawl and an actuating lever therefor, both said pawl and lever being of channel shaped form dimensioned to fit snugly along the periphery of said ring, said lever having a yoke on one end thereof with its legs pivotally connected to the ring adjacent one end of the latter, said pawl also having a yoke on one end thereof with its legs pivotally connected to said lever adjacent the

latter's pivotal connection to the ring, the sum of the respective lengths of said lever and pawl yokes being at least slightly greater than the distance between their respective pivotal connections in a direction circumferentially of the ring, thereby permitting said lever and pawl to be retracted snugly against the ring periphery with the central body portions of the pawl and lever in longitudinally alined and non-overlapping relation, the other end of said pawl having two transversely alined projections thereon, and the end portion of said ring opposite said lever having two circumferentially extending rows of holes therein adapted to be engaged by said pawl projections in selected pairs and arranged with said rows of holes lying on opposite sides of the median plane of said ring.

2. In a device of the type described for clamping a head on a barrel, the combination with a split ring of channel shape cross section, of a hand lever pivoted adjacent one end of said ring to swing in the plane of the latter, said ring having two rows of circumferentially spaced holes in its end portion opposite said lever with the holes arranged in two rows lying on opposite sides of the median plane of the ring, and a pawl pivoted on said lever intermediate the latter's ends to span the gap in the split ring, and having a pair of projections on the free end thereof engageable with successive pairs of said holes to draw the ring tight as the lever is swung away from the gap in the split ring.

3. In a device of the type described for clamping a head on a barrel, the combination with a split clamping ring, of a lever, a pivot pin supporting said lever on one end portion of said ring to swing in the ring plane and arranged with said pin projecting laterally from the ring, a pawl pivotally connected at one end to an intermediate portion of said lever, said ring and lever and pawl all being of channel shaped cross section with the pawl and lever dimensioned to fit snugly along the ring exterior when in retracted position and a lug projecting from the side of said pawl to overlie said projected pivot pin when the pawl and lever are retracted, said lug and pin having registering apertures therein to receive a sealing wire.

CARL C. GROTNES.