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BARREL CLAMPING RING AND LUG ELEMENT

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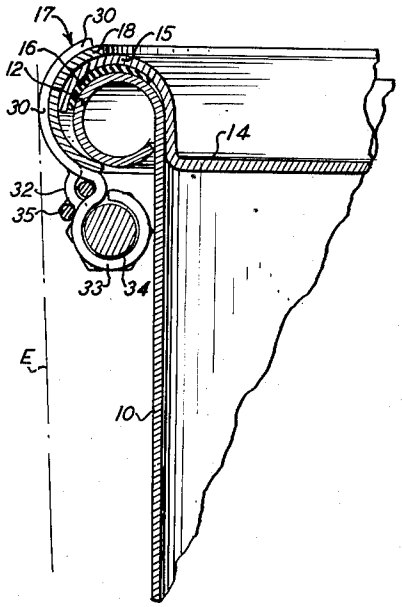


Fig. 1

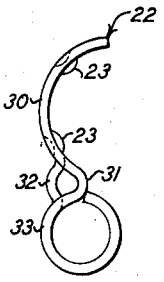


Fig. 3

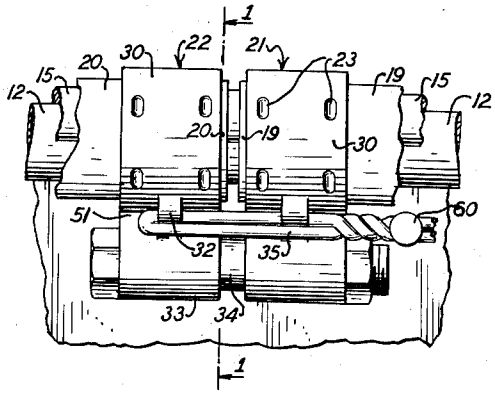


Fig. 2

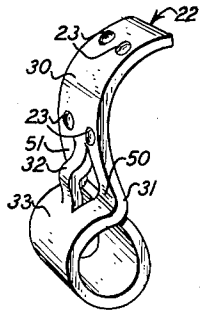


Fig. 4

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BARREL CLAMPING RING AND LUG ELEMENT

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Our invention relates to a fully removable drum head clamping member for providing a fluid tight seal between an open-ended drum and its associated closure member. More specifically, our invention is directed to a clamping member having depending lugs provided with lower bolt receiving holes or sockets and intermediate sealing or locking wire loops, the bolt receiving sockets and the locking wire loops being positioned inwardly of the outer peripheral surface of the clamping member to enable handling of the drum without damage to the mechanism.

A locking wire is used with barrel or drum closure rings to seal the barrels in a closed condition. A broken seal indicates tampering and possible pilferage during shipment and storage. The prior art discloses locking wire designs wherein the wire is exposed to damage during normal handling of the drum. In some devices, the loop for receiving the wire is formed by stretching a cut-out portion of the ring or attached lug into an arc outwardly of the base member thereby reducing the cross-sectional dimension between outer and inner loop surfaces. The resultant loop is a greatly weakened structure located in an exposed position. In other designs, special bolts with locking wire receiving holes drilled therethrough are provided; this extra machining adds greatly to the cost and requires bolts of added length.

Our invention provides a clamping member comprised of a radially slit ring having depending lugs near the end portions of the ring. The curved tips of the lugs are connected to the ring in a fixed manner. The intermediate portion of each lug includes an inwardly disposed lock crotch and an opposed outwardly disposed lock strap, the crotch and strap defining a lock receiving loop. The strip material from which the lug is manufactured is vertically cut at the crotch area for a distance along its length to form a center panel which can be outwardly bent to form a strap, the crotch being formed by inwardly bending the two remaining outer panels to form two inwardly disposed V-sections. The bottom of the lug is bent in a manner to form a bolt receiving socket. The thickness of the material of the lock strap between its outer and inner surfaces is not changed from its original thickness prior to bending as no stretching or extension of length is required. The lugs are mounted close to each other on the ring so that the bolt and lock wire can be of minimum length. The lock receiving loops and the bolt receiving portions are designed for positioning inwardly of the outer periphery of the clamping ring so that the barrel may be rolled and placed adjacent other barrels without injury to the mechanism.

Other important objects and advantageous features of our invention will be apparent from the following description and accompanying drawing wherein for purposes of illustration herein a specific embodiment of our invention is set forth in detail and wherein:

Figure 1 is a cross-sectional side view of a portion of a drum with a drum head clamped in sealing condition; this view is taken on line 1—1 of Figure 2;

Figure 2 is a front view of the clamping ring shown in Figure 1 showing the mechanism in assembled condition; and

Figure 3 is a side view of a lug; and

Figure 4 is a perspective side view of a lug.

Referring now to Figures 1 and 2, it will be seen that the barrel or drum 10 has an upper bead 12 formed thereon. Suitable beads of equivalent or greater peripheral dimension are often formed intermediate the ends of the drum. A drum head 14 is received in the open end of the drum and includes a drum head flange 15 which covers and surrounds a substantial portion of the top bead 12, a suitable sealing gasket material 16 being provided between the drum head flange 15 and bead 12 to prevent leakage where necessary. The drum head 14 is of the type known as a fully removable drum head and is held in engagement with the drum by a clamping means 17 which upon peripheral compression squeezes or cams the flange 15 into tight engagement with the sealing gasket material 16 and the bead 12.

The fully removable drum head clamping member 17 comprises an outwardly convexed C-shaped ring, 18, the inner surface of which defining an annular chamber for receipt of the flange 15 and bead 12. The ring 18 is radially split to enable relative movement of the ends 19 and 20 thereof; telescoping ends would, of course, be satisfactory under some circumstances. However, the spaced ends shown are preferred as better protection within the space available is afforded the lock wire 35. It will be noted in Figure 1 that the upper concave surface of the ring 18 contacts the outer convex surface of the head flange 15 and that the lower concave surface of ring 18 contacts the lower convex surface of the bead 12.

Preferably, the compressing and locking means of the invention includes similar lugs 21 and 22, which are attached at their tops to the end portions 19 and 20, respectively, of the ring 18, this connection being preferably accomplished by welding. It will be seen in Figures 3 and 4 that dimples 23 are provided to facilitate the formation of a sound welded attachment. If economical and feasible, it is, of course, to be understood that the depending lugs 21 and 22 could be made integral with the clamping ring. Preferably, however, the lugs are produced from coils of strip steel in an automatic fashion by a multi-slide machine wherein a strip of metal is progressively cut and bent to form the desired end product in an economical manner.

Each lug (21 and 22) comprises a convex top 30, an intermediate concave crotch 31, an intermediate oppositely disposed convex strap 32 and a bottom bolt receiving socket 33.

It will be noted that the strip which forms the lug is bent from top to bottom from a continuous length, with the bottom part having an extension which is swung up to close the bolt receiving socket 33. The lock strap 32 is formed by cutting the strip on two parallel lines along its length, the ends of the cuts being substantially equal in distance from the crotch and the cuts being preferably on either side of the longitudinal center line of the strip of material so that the strap provides a central convex portion 32 and the crotch is formed by two concave portions 50 and 51 on either side of the strap. It will be noted in Figure 3 that the lock receiving loop (formed by the crotch 31 and strap 32) and the bolt receiving socket 33 define a figure 8 with the upper portion being smaller in size.

In the preferred embodiment the bolt 34 is short and accessible for adjustment by being located inwardly of the outer periphery of the ring 18. The lock wire 35

is securely and safely housed immediately under and inwardly of the clamping ring **18** and immediately above and inwardly of the outer periphery of the bolt receiving sockets **33**. As seen in Figure 1, therefore, the barrel can be rolled and stored without injury or damage to the sealing wire and bolt. The line E of Figure 1 indicates the line of contact the barrel would assume with a surface if placed in a horizontal position and rolled on the floor. It will be noted that the sealing wire **35** and bolt **34** are safely housed and do not contact the supporting surface.

As previously mentioned, the strap **32** retains its original thickness since no elongation is required in the formation of the strap. The strap **32** acts as a structural brace for the remainder of the lug and greatly aids in preventing twisting of the lugs as the bolts are tightened. The lock receiving loop formed by strap **32** and crotch member **50** and **51** is substantially square in cross section and provides a crotch at one corner thereof which aids in threading the locking wire **35** into place. Also, the square opening inhibits clogging by dirt, paint or the like. The lugs are easy to manufacture from standard material and provide an inexpensive answer to a very difficult problem without sacrifice of structural integrity.

It will be noted in Figure 2, that a lead seal **60** is cast around the ends of the lock wire **35**.

While the invention has been described in terms of certain embodiments and examples, these are to be considered as illustrative rather than limiting and it is desired to cover all modifications and further embodiments that fall within the spirit and scope of the appended claims.

We claim:

1. A fully removable drum head clamping member comprising a radially split ring adapted to embrace a drum head flange and a drum bead, said ring having end members and being peripherally compressible inwardly to cause relative movement of said end members, compressing and locking means including lugs attached at their tops to and depending from the ring at locations near their respective end members, each lug having an intermediate inwardly disposed lock crotch, a bottom bolt receiving socket, and an outwardly disposed curved lock strap formed outwardly of and opposed to said crotch of material cut from the lug at the crotch, said strap and crotch being the same thickness of material between inner and outer surfaces and defining a lock receiving loop, the loop and the bolt receiving socket being positioned inwardly of said ring, the sockets and loops being in close proximity to each other to facilitate peripheral compression of the ring.

2. A fully removable drum head clamping member comprising a radially split outwardly convex ring adapted to clamp an upper drum head flange to a lower drum bead, said ring having end members in proximate but spaced apart relation, said ring being peripherally compressible inwardly to cause movement of said end members toward each other, compressing and locking means including two lugs welded at their tops to and depending from the ring at locations near their respective end members, said tops of said lugs being convex, each lug having an intermediate concave lock crotch, an intermediate convex lock strap formed outwardly of and substantially opposed to said crotch of material cut from the lug at said crotch, and a bottom bolt receiving socket; said strap and crotch being the same thickness of material between their inner and outer surfaces and defining a substantially square lock receiving loop.

3. A lug for attachment to an opposed end of a radially slit clamping ring of a fully removable drum head clamping member including a convex top, an intermediate concave lock crotch, an intermediate convex lock strap formed outwardly of and substantially opposed to said crotch, and a bottom bolt receiving socket; said lug being made of strip metal with said strap being defined by the metal cut from the central portion of said crotch and bent to form a convex member, said bending being accomplished without stretching the metal whereby to maintain the same metal thickness between outer and inner surfaces of said strap.

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