June 6, 1939. F. GETTELMAN 2,161,155

METAL BARREL

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Fig. 1.

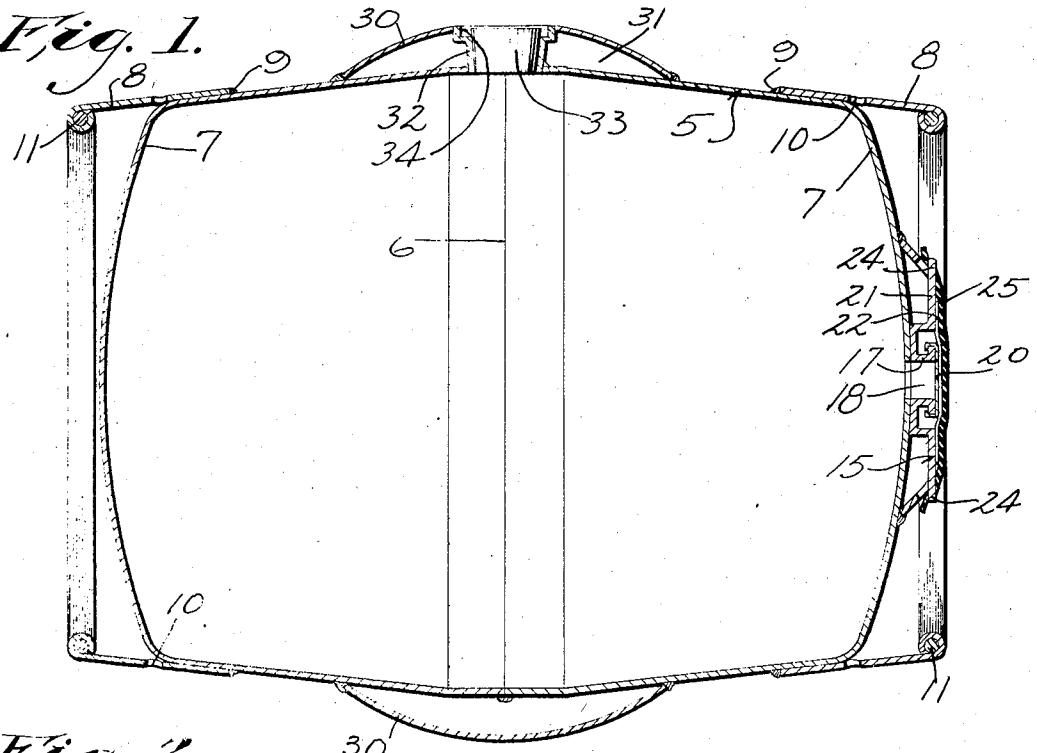


Fig. 2.

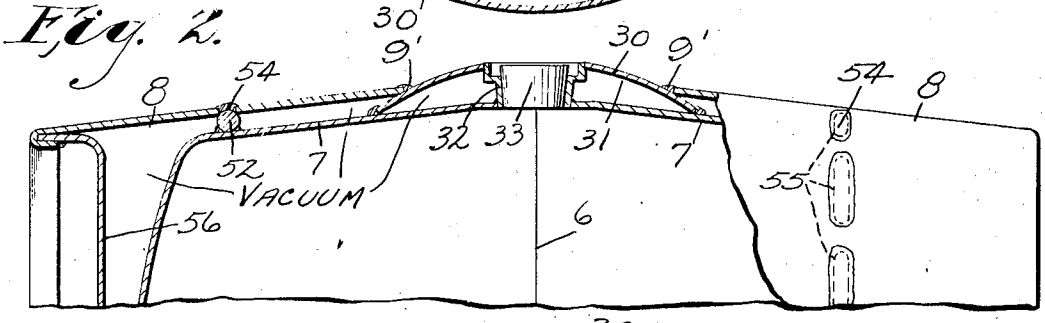


Fig. 3.

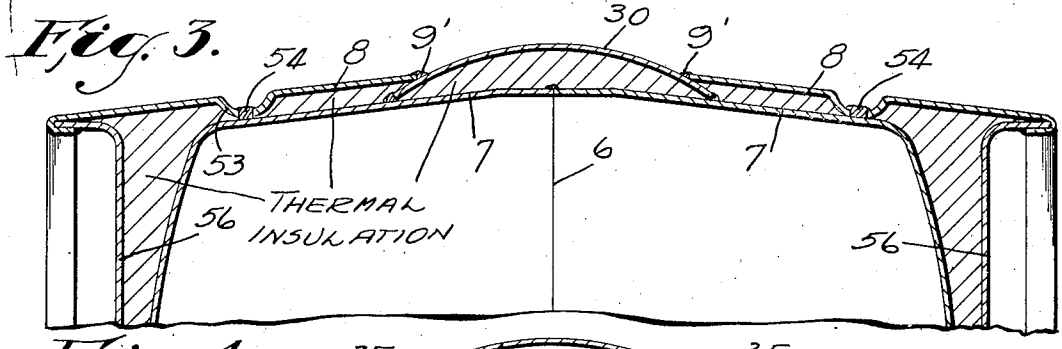
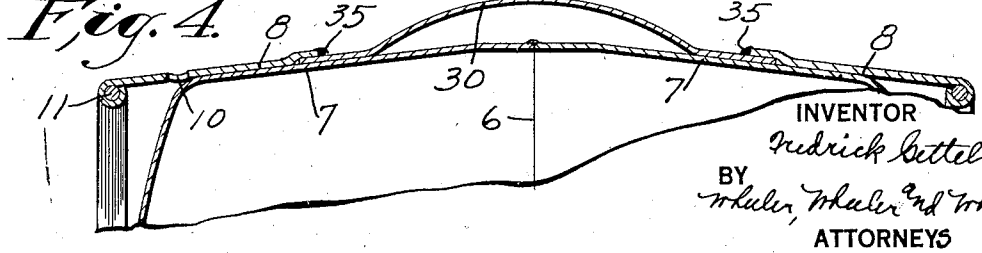


Fig. 4.



INVENTOR
Fredrick Gettelman
BY
Wheeler, Wheeler and Wheeler
ATTORNEYS

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Fig. 5.

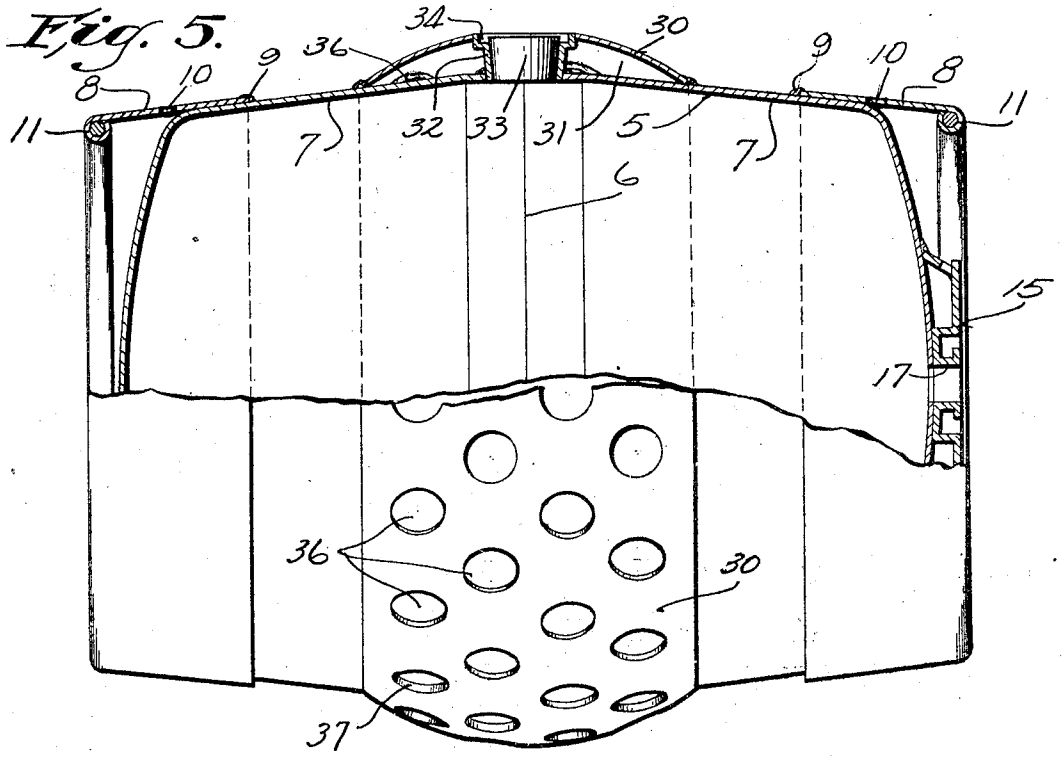


Fig. 6.

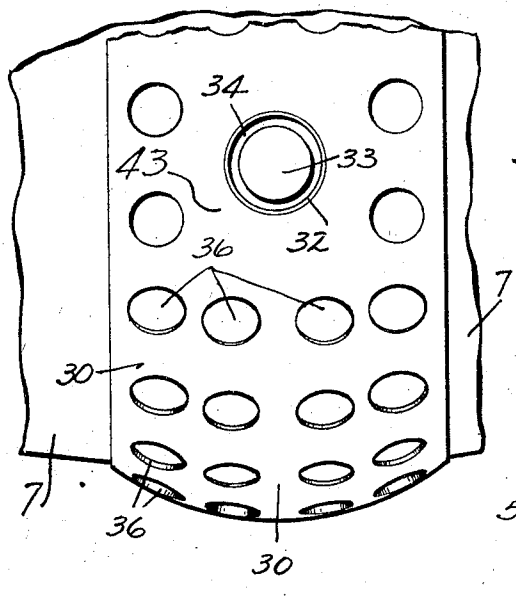


Fig. 7.

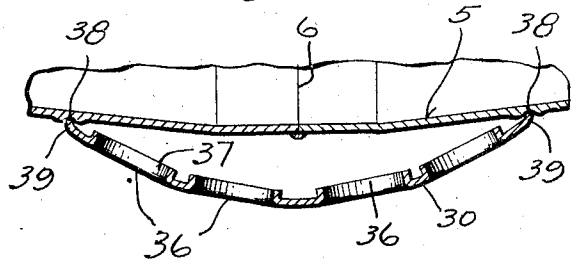
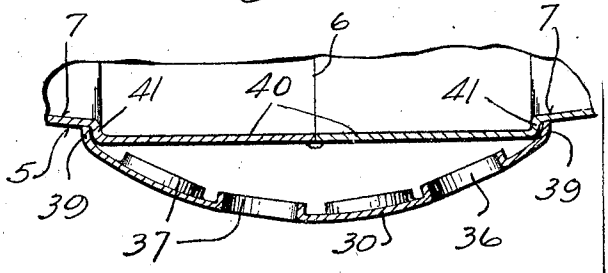


Fig. 8.



INVENTOR
Fredrick Gettelman
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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METAL BARREL

Fredrick Gettelman, Milwaukee, Wis.

Application September 15, 1933, Serial No. 689,592

7 Claims. (Cl. 220—71)

This invention relates to improvements in metal barrels.

It is the primary object of the present invention to provide a novel and improved metal barrel which will be at least as light, and preferably lighter, in weight than a wooden barrel, which will be so formed and shaped that it may be washed, filled and handled in all respects as well as a wooden barrel, which will provide an interior chamber having a perfectly smooth interior surface of such contour as to drain freely to the bung fitting, and which will have a bilge or girth band of such design and dimensions and proportions with respect to said chamber as to support the bung fitting and to sustain the entire weight of the barrel with a minimum of possibility of injury either to the band or the chamber or vessel in which the contents of the barrel are confined.

The proper formation and proportionate dimensions of the band, and its application to the container, is a matter of great importance, and a great many factors require consideration. The barrel must be so designed as to be adapted for use in conventional filling and washing and handling equipment. The bung fitting must preferably be designed to receive a conventional wooden bung, which is by far the simplest and quickest means of closing the bung opening. Such a bung is applied with a heavy hammer blow, the impact of which must be taken into account in the construction of the barrel.

When the barrel is filled and closed it is a heavy object which the workmen do not have time to handle as carefully and slowly as they would ordinarily handle other objects of like weight. Consequently the filled barrels are frequently dropped and otherwise abused in handling, and the construction of the barrel must be such as to minimize the injury both to the inner chamber and to the encircling band, which is one of the features of the present invention. If the inner chamber is badly dented, the interior coating may be broken or damaged, and also the change in form may interfere with the proper drainage and cleaning of the barrel. If the outer band is unduly indented the barrel will not be adapted for proper guidance when the barrel is being rolled.

I have found that all of the foregoing considerations make it extremely important that the barrel be designed in accordance with the present invention to provide a girth band of such convexity that its central peripheral portion will engage and support the bung fitting and its marginal portions will engage the storage chamber at points intermediate the bung fitting and the ends of said chamber.

The fact that the girth band engages the bung fitting at its end, and marginally engages the central chamber or cask at points spaced from the bung fitting provides a semi-rigid brace for the bung fitting which permits it to yield but slightly under the hammer blow which drives the bung, and rather positively anchors the bung fitting against such displacement as might tend to break its connection with the inner chamber or cask.

If the span of the convex girth band longitudinally of the barrel is unduly short, the weight of the barrel and its contents will be unduly concentrated upon the intermediate portion of the inner chamber or cask, thereby tending to make the inner chamber dent readily when the barrel is dropped under full load. If, on the other hand, the girth band is unduly elongated so that its margins are engaged with the inner chamber or cask only at the ends thereof, then the convexity of the band will be so slight that unless its weight is increased beyond practical limits, the band itself will be subject to excessive denting.

In order to provide the best possible support for the barrel and its contents with a minimum weight of material both in the band and in the inner chamber or cask, it is quite desirable that the construction be such that the pressure of the band shall be transmitted to the inner chamber or cask as nearly as possible directly midway of the distance between the center or bilge and the ends of the chamber or cask. Therefore, the margins of the girth band preferably engage the inner chamber or cask along these particular midway lines, or some equivalent means is provided for distributing the load over the general area adjacent either side of said lines, whereby to secure equivalent support.

It is a further object in some of the constructions hereinafter to be disclosed, to utilize the space between the walls of a double walled barrel for the thermal insulation of the barrel contents.

It is a further object of other embodiments of the invention to provide for the use of light and comparatively soft materials in barrel construction, and to reinforce such materials in a way to facilitate the assembly and to minimize the weight of the completed barrel.

In the drawings:

Figure 1 is a view in axial section, of a barrel embodying the invention.

Figure 2 is a fragmentary detail in like section through a barrel representing a modified embodiment of the invention.

Figure 3 is a view in like section showing a portion of a further modified embodiment of the invention.

Figure 4 is a view in like section showing a further modified embodiment of the invention.

Figure 5 shows partially in side elevation and partially in axial section, a further modification of the invention.

Figure 6 is a fragmentary detail showing in plan the bung fitting of a barrel similar to that shown in Figure 5 but slightly modified.

Figure 7 is a fragmentary detail in cross section through a portion of a modified embodiment of the invention.

Figure 8 is a fragmentary detail in cross section through a further modified embodiment of the invention.

Like parts are identified by the same reference characters throughout the several views.

The container proper comprises a shell 5 which may be made up of two separate end portions welded together about a central line 6, which preferably represents a larger diameter than the diameter of the shell adjacent its heads 7.

The heads 7 are preferably convex, so that all portions of the shell 5 will drain toward any point thereof which happens to be lowermost. This feature is of great advantage not only in emptying the barrel, but particularly in washing.

Projecting beyond each head of the barrel at the ends thereof, is an annulus 8 conforming to the taper of the barrel and welded thereto at 9 to comprise a chine. Each annulus is preferably provided with a series of ports 10 so that when the barrel is standing on end any liquids tending to accumulate within the annulus 8 will be drained therefrom to protect the metal from corrosion.

The chines 8 are preferably made of relatively heavy metal as compared with the container 5. They are heavily beaded at 11 to withstand the hard usage encountered during the manipulation of the barrel in practice.

Fully protected by one of the chines 8 is a tap fitting 15 which includes a sleeve 17 adapted to receive a stopper 18 and flanged over at 19 to provide anchorage for a detachable cap 20. In the respect just described the fitting 15 may be of any conventional type.

In order to receive the government stamp, the fitting 15 is preferably provided with a rather extensive planiform surface at 21 to which a stamp or seal 22 may be applied over the cap 20 and the stopper 18. To protect the stamp while the barrel is in transit it is preferred that the fitting 15 be formed to provide tongues at 24 over which the apertured ends of an elastic protector 25 may be engaged. The protector may conveniently be made of rubber or elastic fabric.

One of the very important features of the invention consists in the provision of a convex girth band 30 applied about the central, maximum diameter portions of the shell 5. The convexity of this band 30 is much greater than that of the shell itself, so that a comparatively wide space is formed at 31 which is sufficient to receive the inwardly tapered bung fitting 32. This bung fitting is of sufficient dimensions to receive and properly to hold a tapered bung plug 33 of adequate size, without any projection of said bung beyond the girth band 30. The fitting is preferably shouldered outwardly at 34 to expose the end of the bung.

Together the band 30 and the chines 8 comprise means for rigidly reinforcing and strengthening the shell 5 which may consequently be made of relatively light material. If desired, the chines 8 and the girth band 30 may be so extended as to contact each other and permit of a weld uniting these elements as shown at 35 in Fig. 4. Either construction permits the shell or container proper to be made of relatively thin and light weight material, since the girth band 30 and the chines 8 at the ends of the barrel are, in either case, so positioned as to take all shocks during the rolling and upending of the barrels. The girth band 30 not only protects the barrel but greatly facilitates the rolling and the upending thereof.

It will be obvious from an inspection of any one of the sectional views Figs. 1 to 5, that when the central cask or shell is filled and the barrel is thrown upon or is resting upon the band 30, the load will, under all circumstances, be properly distributed. Roughly, the length of the barrel may be considered as being divided into quarters, the bung fitting being located midway between the ends and the margins of the bilge band being so connected to the central cask or shell as to receive and transmit load from and to the portions of the shell midway between the bung fitting and the respective ends. Thus it may be considered that one half of the contents of the barrel will rest approximately centered upon one margin of the girth band, while the other half of the contents of the barrel will be roughly centered above the other margin of such band. It is demonstratable that not only is the weight better distributed through this particular construction, but also the convexity of the band in this form is better adapted to protect both the band and the shell from damage than would be the case if the band were either materially wider or materially narrower.

In Figs. 2 and 3 I have shown a thermally insulated container which, in addition to the advantages of the constructions heretofore described, has the further advantage of protecting the contents of receptacle 5 from heat and cold. The construction is very similar to that above described except that the annuli 8 are made slightly larger in diameter than the annuli shown in Figs. 1 and 4, and are therefore spaced from receptacle 5. The inner margins of annuli 8 are welded at 9' to the girth band 30 and are spaced from the ends of receptacle 5 either by means of rings 52, as in Fig. 2, or by integral internally formed ribs 53, as in Fig. 3.

In either case the final weld 54 may, as a matter of convenience, be made by forming the annulus 8 with peripherally spaced slots 55 through which the welding material 54 extends to join the annulus 8 with the underlying surface.

False heads 56 are welded to annuli 8 and serve to complete an enclosure about the inner receptacle 5. The space within girth band 30 and annuli 8 in this form of construction is insulated either through the use of a suitable insulating material or by withdrawal of the air to produce such degree of vacuum as is practicable.

The construction shown in Figs. 2 and 3 retains all the advantages of the above described constructions so far as concerns clearance in which the bung hole and tap fittings may be located. Additionally, constructions shown in Figs. 2 and 3

have a relatively high degree of thermal insulation value.

These constructions are disclosed and claimed in my divisional Patent No. 2,071,621 of Feb. 23, 1937.

The construction shown in Figs. 5 to 8 inclusive, are directed to further reductions in weight. I have discovered that notwithstanding the requirements in the matter of dimensions and weight of stock, the weight of the girth band may be reduced and at the same time its strength may even be increased by providing it with a series of apertures not only to eliminate a large proportion of the metal, but also to form flanges about the margins of such apertures, which act as reinforcing ribs for the band.

The general convexity and proportions of the girth band **30** correspond identically to those previously described. The band is, however, preferably punched throughout its extent with holes such as those shown at **36**, the metal girth band adjacent each hole being formed inwardly, as clearly shown in Figs. 7 and 8, to make a narrow reinforcing flange **37**.

Since a substantial amount of material is removed the weight of the girth band is appreciably lightened, and experience demonstrates that even without the formation of flanges **37** the girth band will not be materially weakened. When the flanges are used the band may actually be increased in strength to permit the use either of a lighter weight of metal, where the metal is inherently rigid, or the use of a greater thickness of metal for a given weight where the metal is more flexible, as in the case of aluminum.

While the girth band will ordinarily be welded to the shell, it is possible to fasten it by another means, without using rivets. Rivets may be used without leakage, due to the fact that the interior of such a barrel is ordinarily pitched in any event. The application of rivets to such a barrel with closed heads may, however, be a difficult operation.

In the construction shown in Fig. 7 the material comprising the shell **5** has been grooved at **38** and the marginal portions **39** of the girth band **30** have been shrunk into the grooves **38** to establish a permanent connection between the girth band and the barrel. The engagement between the parts may be effected in either of two ways. The band may be heated preliminary to placing it over the barrel and then shrunk into place, or, preferably, the marginal portions of the band are rolled or otherwise compressed to force them into the grooves **38**, whereby they are fixed against axial displacement.

In the Fig. 8 construction the component portions **7** of the shell **5** have enlarged central portions **40**, the formation of such portions resulting in the provision of shoulders at **41**. When the marginal portions **39** of the girth band are shrunk into engagement with shoulders **41**, the girth band is anchored against axial movement upon the shell just as in the Fig. 7 construction.

No particular arrangment of the holes **36** is required. In the disclosure in Figs. 5 and 8 the holes are staggered, whereas in the disclosure of Figs. 6 and 7 they are arranged in a series of rows. In the Fig. 6 construction there is a central ring portion **43** which is substantially unbroken except for the bung fitting **32**, and which thereby provides a perfectly smooth path for the rolling of the barrel. The holes, however, will in any event be sufficiently small with reference to the total diameter of the barrel so that they will not interfere to any perceptible degree with the rolling of the barrel even when the holes are staggered across the inner surface of the girth band as shown in Fig. 5.

I claim:

1. In a barrel, the combination with an inner shell adapted to contain a liquid, of a bung fitting applied to a central portion of the side of said shell and connected at its inner end to the shell, a girth band encircling the central portions of the shell and convexly contoured axially of the shell to provide a central rolling portion, said band being connected to said bung fitting adjacent the end thereof, extending symmetrically and free of convolutions to said shell and being marginally connected with said shell along peripheral lines so located intermediate said bung fitting and the ends of the shell as to equalize the load between said shell and girth band.

2. A barrel comprising in combination a pair of cup shaped members with convex heads marginally united to comprise a closed shell for the retention of liquids, a bung fitting communicating with the interior of said shell and connected therewith substantially upon the center line upon which said members are united, a girth band of convex cross section having its central portion connected to the outer end of said bung fitting and marginally contacting portions of said shell intermediate said center line and the respective ends of said members, whereby to enclose and relieve of load the line of union between said members and to provide substantially uniformly distributed load bearing support for said shell and its contents.

3. In a barrel, the combination with a metallic shell having a lateral aperture, of a bung fitting applied to said shell in such a manner that all portions of said shell may be drained therethrough, and an annular girth band completely encircling said shell and laterally secured thereto along lines spaced from said bung fitting toward the ends of said shell but remote from such ends, and intermediate portions of said band being convexly bowed from an intermediate portion of greatest radius smoothly to said shell to provide a spacing from said shell sufficiently deep to receive wholly said bung fitting, whereby said fitting and a bung therein are protected during the manipulation of the barrel and whereby a load upon said band subjects the band to compression without substantial bending strains and said load is distributed to portions of said shell intermediate its center and its respective ends.

4. In a barrel, the combination with a pair of cup-shaped sections joined upon a median line to constitute a liquid containing shell and provided adjacent said line with an aperture, of a bung fitting applied to said shell at said aperture for full drainage of the contents of the shell through said bung fitting, said bung fitting projecting radially from the shell, of a girth band encircling the central portion of the shell and spaced therefrom for a distance substantially equal to the radial projection of the bung fitting, said girth band being apertured in registry with the bung fitting and secured marginally thereto, and the margins of the girth band being secured to the shell intermediate said median line and the ends of the shell, said shell including means providing spaced shoulders witnin the girth band and about which the margins of the girth band extend to their connection with the shell.

5. In a barrel, the combination with an inner shell comprising a pair of cup-shaped elements

providing ends for the shell and joined to each other upon a median line, said shell being apertured adjacent said line, of a bung fitting connected with the shell about the aperture and projecting radially therefrom, and a girth band having an aperture registering with the end of the bung fitting and secured to the bung fitting at such end and convexly contoured axially of the shell to provide a central rolling portion from which said band extends convexly and free of convolutions under compression to the shell, the margins of said band being connected with the shell substantially midway between said median line and the ends of the shell, and said shell having an enlarged central portion providing shoulders within and immediately adjacent the margins of said band and about which said band extends.

6. In a barrel, the combination with a metallic shell having a lateral aperture, of a bung fitting applied to said shell in such a manner that all portions of said shell may be drained therethrough, said shell being provided with peripheral shoulders spaced between said bung fitting and its respective ends and an annular girth band completely encircling said shell and laterally secured thereto about said shoulders along lines spaced from said bung fitting toward the ends of said shell but remote from such ends, and intermediate portions of said band being convexly bowed from an intermediate portion of greatest radius smoothly to said shell to provide a spacing from said shell sufficiently deep to receive wholly said bung fitting, whereby said fitting and a bung therein are protected during the manipulation of the barrel, and whereby a load upon said band subjects the band to compression without substantial bending strains and said load is distributed to portions of said shell intermediate its center and its respective ends.

7. In a barrel, the combination with a metallic shell having a lateral aperture in a central portion and provided intermediate the aperture and the ends of said shell with peripherally shouldered portions spaced from said aperture and from said ends, of a bung fitting applied to said shell in such a manner that all portions of said shell may be drained therethrough, and a girth band of convex cross section centrally connected with said bung fitting in spaced relation to the shell at a distance sufficient to receive wholly said bung fitting and marginally engaging the shouldered portions of the shell, whereby to be positioned by said shouldered portions and to brace said bung fitting from the shell and protect it from injury while providing a peripheral rolling surface for the barrel, and adapted to distribute a load under compression without substantial bending strains to said shell intermediate its center and its respective ends.

FREDRICK GETTELMAN.