

Aug. 10, 1937.

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2,089,624

NONCREEP METALLIC BARREL

Filed Sept. 26, 1934

2 Sheets-Sheet 1

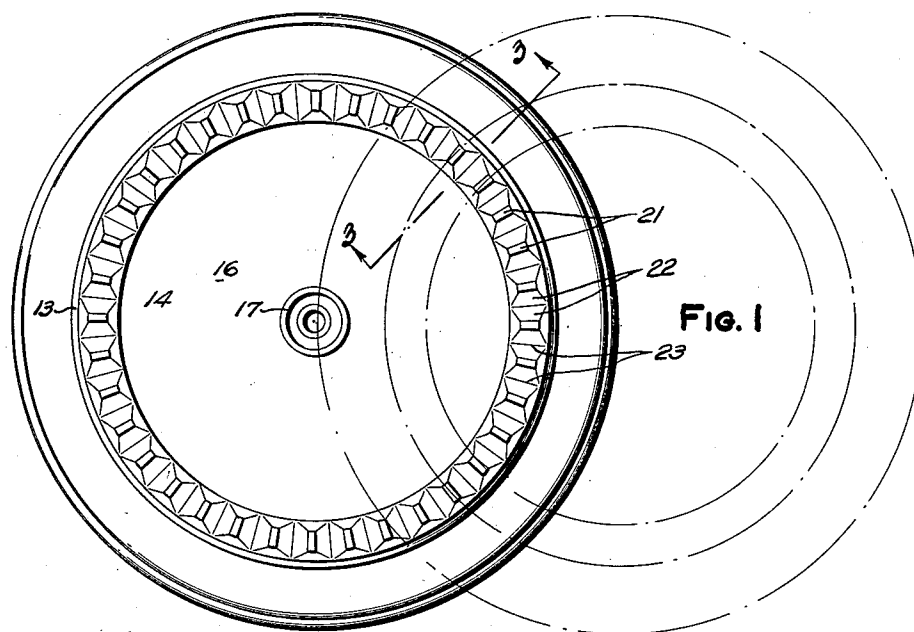


Fig. 1

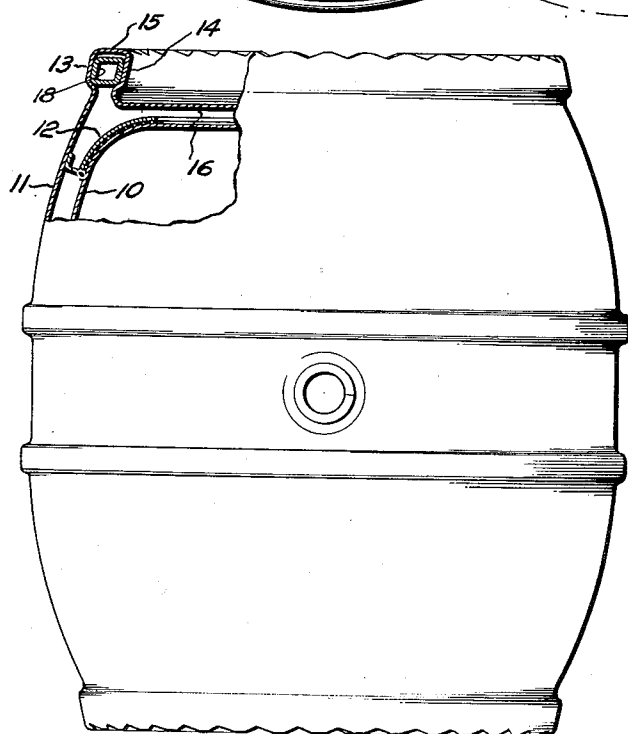


Fig. 2

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FIG. 3

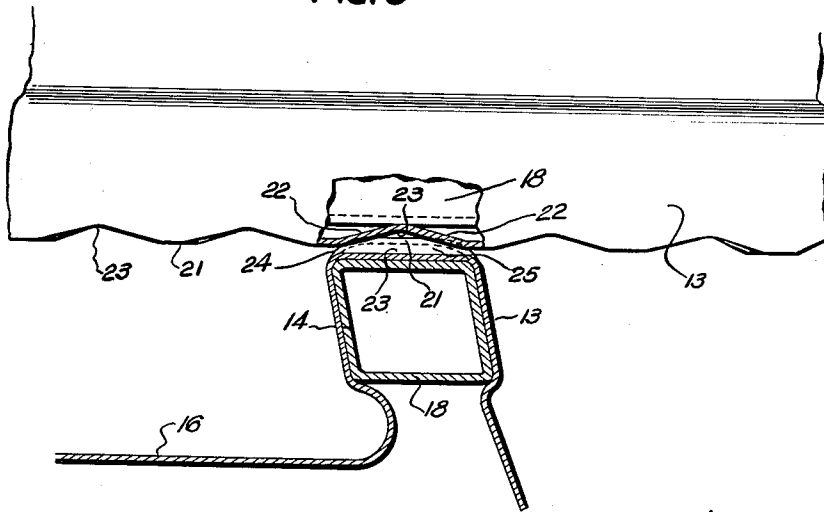


FIG. 5

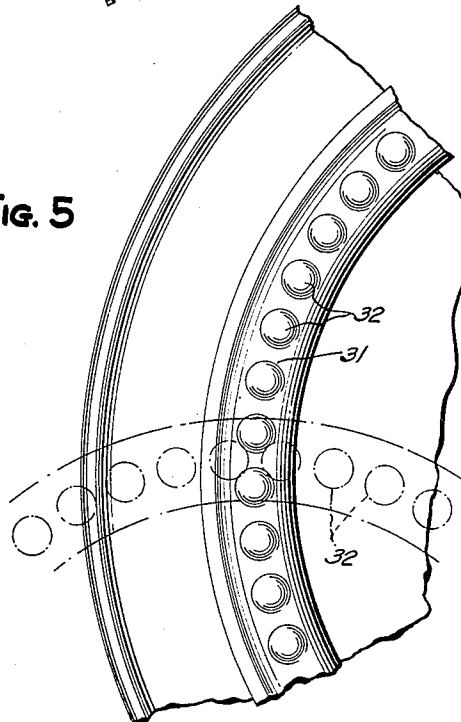
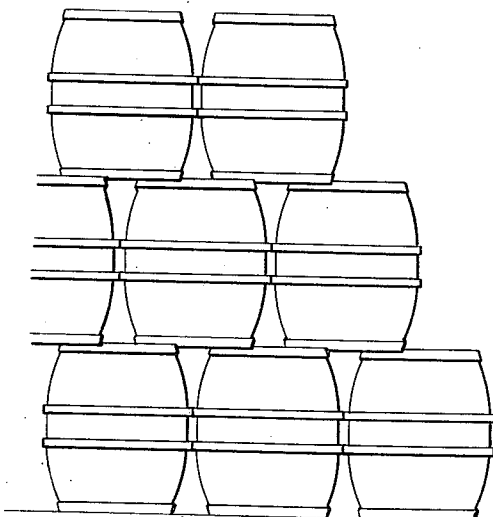


FIG. 4



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UNITED STATES PATENT OFFICE

2,089,624

NONCREEP METALLIC BARREL

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Application September 26, 1934, Serial No. 745,492

7 Claims. (Cl. 220—97)

This invention relates to barrels, and it has particular reference to a metallic barrel having an end or chime portion so formed as to restrain creeping or undesired movement of the barrel under the influence of vibratory or other adventitious forces.

With the resumption of large scale activity by breweries in this country, there has been a demand for metallic barrels suitable for use in storing or transporting the beverages made and sold by such establishments. Connected with this demand, however, has been the condition that such barrels could be handled at all times in substantially the same fashion as wood barrels, previously utilized for the same purposes. One detail of such condition has been that the metallic barrels could be stacked on each other in pyramid fashion, in accordance with the usual brewers' practices, so that space in the warehouse, or on the loading platform, could be conserved.

Accordingly, it has heretofore been proposed, by myself with others, to make a metal barrel with spaced inner and outer walls, and with a chime portion having a relatively wide and flat end or rim,—the theory being that such broad end surface would provide adequate contact area to permit the barrels to be stacked in a satisfactory manner. Experience has shown, however, that this idea, while providing a strong and durable barrel, has not provided a barrel which may be stacked with complete safety. It has been found that a stack of barrels, in a warehouse, or on a loading platform, or in a truck, for example, both when full and when empty, will fall down, due to the creeping of the upper barrels over the ends of the supporting barrels. Such effect cannot, of course, be tolerated, as a loaded barrel, falling from such height, constitutes a serious menace to workmen, and also subjects the barrel to severe strains.

The result of creeping and tumbling may be attributed to the presence of adventitious vibratory forces, such as are caused by the passage of a train, or a heavy truck, or the vibrations set up by heavy stationary machinery, and which forces are, of course, practically uncontrollable. Expedients for overcoming the effects of these vibrations, such as tying the barrels to each other by ropes, or interposing mats between the barrels, are unacceptable.

To overcome the effect of the vibrations, in a manner suitable to those who must use the barrels, and withal provide a metal barrel which can be handled in the known and customary

fashion, the present invention contemplates the forming or construction of the end of the barrel in such manner as to provide a static interlock with the end of a similar barrel, adequate to maintain the barrels in stacked relation in the presence of the vibrations. As hereinafter more particularly illustrated and described, the invention takes the form of a metallic barrel having an end provided with a plurality of spaced protuberances having more or less sloping faces, so that the barrels may interlock with each other when stacked, but may also be slid over each other with comparative ease when it is desired to dislodge them, due to the camming effect between the surfaces of the protuberances.

Two forms of the invention are illustrated in the accompanying drawings, wherein:

Fig. 1 is a top view of one form of barrel;

Fig. 2 is a side elevation hereof, with portions broken away to show the chime structure;

Fig. 3 is an enlarged fragmentary section on the line 3—3 of Fig. 1, also showing the nature of the contact between two stacked barrels;

Fig. 4 is an elevation, on a reduced scale, showing how the barrels are stacked; and,

Fig. 5 is a fragmentary plan view showing another form which the invention may take.

Referring first to Fig. 2, the barrel therein shown is composed of an inner shell 10 and an outer shell 11, suitably spaced by such means as the annular saddles 12, to provide a double-walled structure having heat insulating properties. The ends of the outer wall 11 are formed with an outer portion 13 and a somewhat reentrant inner portion 14, connected to each other by a relatively flat end 15, constituting a bearing surface, which portions and end may be generally called the chime. The barrel end is closed (except for the bung-hole 17, Fig. 1) by the metal portion 16, which, as will be noted, is depressed a material distance below the plane of the chime end 15. The chime is also shown as being reinforced by an annular ring 18, disposed within the outer shell 11, which may be omitted if desired, due to the enhanced strength imparted by the protuberances themselves.

Generally speaking, the form of the barrel, as thus far described, is not of the essence of the present invention, but is illustrative of metallic barrels having broad chime ends, and which have been observed to creep. It will therefore be understood that the present invention is not to be restricted to the details of the barrel structure shown in Fig. 2, but that such invention

may be applied to barrels having different structures or contours.

In order to practice the present invention to the greatest advantage, however, it is desirable that the chime end 15 should have an appreciable width. This is due to the fact that such end is deformed or is so constructed as to present a plurality of spaced protuberances, the details of which are more clearly shown in Figs. 1 and 3. Such protuberances, as herein shown, take the form of truncated pyramids having substantially plane crests 21 and sloping side walls 22, which meet like side walls of adjacent truncations at the troughs 23. These elements are shown both in radial and circumferential section in Fig. 3, in which, as it will be understood, two similar barrels are shown in superimposed relation. From this view, it will be seen that the dimensions of the crests and the angularity of the sloping walls 22 is such that two adjacent sloping faces 22 may overlie the flat portion of the contacting crest 21, and contact with the generously rounded or sloping walls 24 and 25, which connect the crests 21 with the inner and outer portions 14 and 13 of the chime. Accordingly, when the barrels are stacked on each other, as illustrated in Fig. 4, the protuberances on the chimes overlie the recessed portions between the protuberances of a contacting barrel, at the two points of intersection of the chime ends, as shown in Fig. 1. There is thus provided an interlock between the barrels, so that vagrant forces cannot move one barrel over the surface of the other.

When it is desired to remove a barrel from the stack, however, the interlock is quickly and easily broken, without the necessity for a straight upward lifting of the barrel. Thus, it will be apparent that no motion can be had between the barrels, unless the upper barrel is lifted to a height sufficient to permit sliding movement, and, at the same time, a horizontal pull is exerted to cause such sliding movement. The vibratory forces experienced in warehouses are not sufficient to cause this motion between barrels embodying the present invention, but if a force is intentionally applied to the barrel, in a horizontal direction, then that force resolves itself into both normal and tangential components, due to the angularity between the contacting cam faces. An intentionally imposed adequate horizontal force will therefore cause the barrels to be released, and so permit the movement of one barrel over another, without resorting to an arduous and separate lifting operation.

The effect just stated has been measured experimentally, by providing a stack of barrels and applying a purely horizontal load to the top barrel of the stack. It was found that jarring forces or vibrations, which would cause a full barrel, weighing some two hundred pounds, and having a smooth end 15, to creep and fall, had no effect on a barrel of equal weight, provided with the present invention. It was also found that a greater force was required to institute sliding movement of a barrel constructed according to the present invention, as compared with a barrel having a smooth end, but that, once the intended horizontal movement was obtained, the barrel under test could be removed from the stack with as much ease as a smooth barrel. It will thus be seen that the present invention provides a static interlock, resisting relative movement under vibratory forces, but an interlock which does not interfere with the intentional removal or stacking of the barrels.

From a consideration of Fig. 3, it will be understood that the desired results may be obtained to best advantage when the truncations 21 are circumferentially spaced a distance greater than the width of the crests, as measured on a radial line. With this relation, the troughs of one barrel will readily straddle the crests of an underlying barrel, without the necessity of adjusting movement.

In the form of the invention shown in Fig. 5, the chime face 31 is formed with circumferentially spaced spherical protuberances or beads 32, of such height that the beads on one barrel meet tangentially a pair of adjacent beads on the contacting barrel, the points of tangency being advantageously on angularly disposed radii. With this arrangement, the horizontal component of a vibratory force will not dislodge the barrels, since the beads cannot pass between adjacent beads in the absence of a definite lifting force. However, when the horizontal force is made sufficiently great, as is the case when it is intended to move the barrel, the camming effect between the curved surfaces of the beads permits the release and removal of the barrel, in the manner previously described.

From the foregoing description, it will be apparent that the present invention provides a barrel structure wherein there is provided an actual interlock, effective to overcome vibratory or adventitious forces tending to cause creeping in a stack of barrels, but which may be readily disengaged, to permit intentional movement of the barrels, by the application of a sufficient manually applied force.

It will also be apparent that the structures herein shown and described do not exhaust the specific ways in which the principle of the invention may be applied in practice. Thus, the chime of the barrel may be initially formed as a separate piece, and may have a narrower or wider end portion, on which may be formed or constructed protuberances of specifically different appearance. Such modifications, however, need not be illustrated further, as they will be apparent to those skilled in the art, and it is intended that they should be regarded as within the scope of the invention, as set forth in the following claims.

I claim:

1. A barrel having metallic chimes extending beyond the ends of said barrel and forming annular bearing surfaces for the barrel when disposed in upright position, and a plurality of protuberances disposed on said surfaces and spaced around said annular portion, the height and spacing of said protuberances being such as to cause an interlocking between the bearing surfaces of two similar barrels when stacked one upon the other.

2. A barrel having metallic chimes extending beyond the ends of said barrel and forming annular bearing surfaces for the barrel when disposed in upright position, said bearing surfaces being formed with a plurality of circumferentially spaced protuberances, sloping walls connecting said protuberances, the distance between the crests of such protuberances with respect to the height thereof being such that the bearing surfaces of two such barrels will interlock when the barrels are stacked on each other, and will move over each other with a lifting effect when subjected to a positive horizontal force.

3. A barrel having a metallic chime extending beyond the end of said barrel and forming an an-

nular bearing surface therefor, said bearing surface having formed thereon a plurality of circumferentially spaced truncated pyramids whose sides slope toward adjacent truncations and toward said end and the outer surface of the barrel, the radial length of said truncations being less than the circumferential distance between them, whereby, when said barrel is stacked on a like barrel, the truncations will interlock to restrain the barrel from movement by vagrant forces, and the sloping surfaces will cooperate with a camming effect to lift the barrel when subjected to a positive horizontal force.

4. A barrel having a metallic chime provided with an annular bearing surface, and a plurality of spherical protuberances projecting from said surface, the relation of the height and circumferential spacing of said protuberances being such that when the barrel is stacked on a like barrel, said protuberances contact tangentially on angularly disposed radii with a pair of adjacent protuberances on the like barrel.

5. A barrel having ends and chime portions extending beyond said ends, each of said chime portions being of metal and defined by an annular bearing portion, a plurality of protuberances formed on said annular bearing portion and being regularly spaced circumferentially thereon, said protuberances having sloping sides, the height of said protuberances and the maximum width thereof being such with respect to the distance between said protuberances that the

sides of adjacent protuberances on said barrel contact with the sides of like protuberances formed on a similar barrel when said barrel is disposed in stacked relation on a similar barrel.

6. A barrel having ends and chime portions extending beyond said ends, each of said chime portions being of metal and defined by an annular bearing portion of appreciable width, a plurality of protuberances formed on said annular bearing portion and being regularly spaced circumferentially thereon, said protuberances having sloping sides, the protuberances having a base width greater than the distance between adjacent protuberances measured at their bases, whereby, when a plurality of such barrels are disposed in stacked relation, the sides of the protuberances of one will contact and interlock with the sides of the protuberances of the other.

7. A barrel having ends and chime portions extending beyond said ends, each of said chime portions being of metal and defined by an annular bearing portion, a plurality of protuberances formed on said bearing portion and being regularly spaced circumferentially thereon, said protuberances having sides which are sloping to the vertical axis of the barrel in both circumferential and radial directions, the distances between said protuberances measured at the lowermost point of said sloping sides being less than the maximum diameter of said protuberances.

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