C. F. TERNEY.

BUNG BUSHING AND CLOSURE FOR BARRELS.

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1,085,571. Patented Jan. 27, 1914.

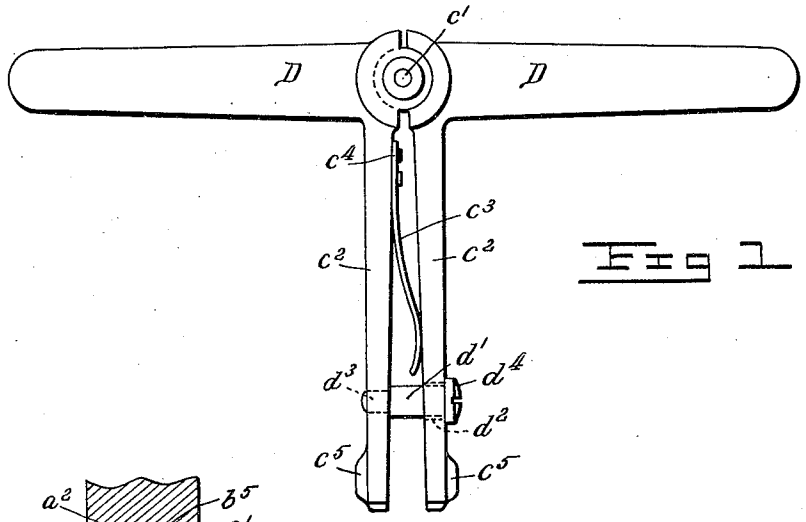


Fig 1

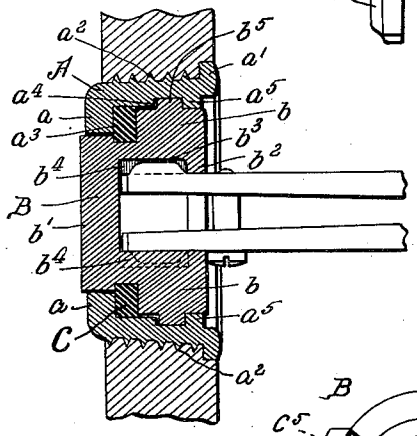


Fig 2

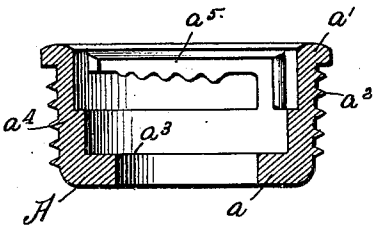


Fig 4

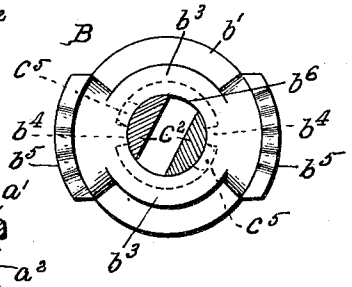


Fig 3

Witnesses

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BUNG BUSHING AND CLOSURE FOR BARRELS.

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To all whom it may concern:

Be it known that I, CHARLES F. TERNEY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Bung-Bushings and Closures for Barrels, of which the following is a specification.

My invention relates to improvements in bung-bushing and closure for barrels or casks and like receptacles.

The object of my invention is to provide a bung-bushing in keeping with the present requirements for the filling, storage, transportation and distribution of all kinds of liquids and oils, also distilled and fermented beverages, especially such as beer and ale and the return of the empty kegs or barrels in transit. In the usual practice at the present time it is customary to provide kegs and barrels for the distribution of such malt beverages with suitable openings which are fitted with tap-valves or closures, through which the packages can be quickly and conveniently tapped and emptied of their contents. In all such cases it is necessary in addition to provide on the side or bilge of same a larger opening, commonly called bung-hole, to be closed or opened by means of a suitable device in order that the packages may be conveniently cleaned, washed, drained and refilled after being coated on the inside so as to keep them in a proper and sanitary condition.

A closure for such bilge opening or bung-hole is the subject matter of the present invention.

With this general object in view my invention consists of a bung-bushing closure which will be positively locked against accidental opening, and which while readily opened with the proper key, cannot be opened surreptitiously with nails, wires or the like.

My invention will be more fully described in connection with the accompanying drawings and then particularly pointed out in the claims.

In the drawings, Figure 1 is a detail side view of the key; Fig. 2 is a sectional view of the bushing and plug showing a part of the key in elevation; Fig. 3 is a plan view of my bung-bushing and closure, the key being in section, and Fig. 4 a section of the bushing.

Referring to the drawing, A is a bung-bushing, whose inner end is rounded at the corner and flanged toward the axis of the bung, said flange being indicated at a. The outer face of the bushing is provided with an annular flange a'. The body of the bushing is in the form of a short truncated cone, and is provided on the periphery with coarse screw-threads, as indicated at a^2. The interior of the bushing is stepped as shown in Fig. 2, to form two interior shoulders a^3, a^4, the former serving as a seat for the closure. The bushing is provided with cam projections a^5, in the present case formed integral with the bushing and projecting inwardly from the inner walls of said bushing, between the shoulder a^4 and the outer face of the bushing. These cam projections, a^5, (in the present case two) extend through an arc of slightly more than 90° and face each other, leaving spaces between their respective ends, for a purpose hereinafter explained. In the present example the outer surfaces of the cam projections lie in planes which are parallel to the plane of the outer face of the bushing, while the under surfaces of the cam projections are inclined, so that the cam projections are each thicker at one end than at the other. The under surfaces of each cam projection may be considered as comprising three portions, namely a smooth portion at the thin end of the cam projection, an intermediate portion having corrugations which extend radially of the bushing and, at the thick end, a smooth portion.

The bung-closure, indicated generally at B, consists of a hollow plug having circular walls, b, a closed bottom b', and a flanged top b^2, which overhangs the inner faces of the walls indicated at b^3. The overhanging top b^2 is arranged to form a central circular opening, whose margin is entire, as shown by b^6, Fig. 3. The inside of said plug B, is provided with radial stops or projections on its interior wall as indicated at b^4. The plug is also provided at opposite sides with overhanging outward extending cam projections, b^5, whose upper or outer faces are inclined to correspond with the inclined faces of the cam projections in the bushing, these inclined surfaces each having a smooth portion near the thin end and a plurality of radial wavy teeth or corrugations between the said thin portion and the thick end of the respective cam projection, these corrugations

being arranged to match and interact with those on the corresponding cam projections of the bushing. In the embodiment of the invention here illustrated, the plug is unitary.

The exterior diameter of the plug at its inner end is such that it will enter the opening of smallest diameter at the inner end of the bushing, while the outer diameter of the flanged top is slightly less than the diametrical distance between the two cam projections of the bushing. In order to make a tight closure, the plug is provided with a heavy rubber ring or packing C which surrounds the plug and rests in contact with the flange of the top. The parts are so proportioned that when the plug is inserted into the bushing, by means of a key, as hereinafter described, the projections, b^5, of the plug will enter the spaces between the ends of the cam projections, a^5, of the bushing, whereby the plug may be pushed down into the bushing, its packing ring C coming into contact with the seat a^3 of the bushing. By a slight revolution of the plug the smooth ends of the cam projections b^5, can move freely beneath the thin ends of the cam projections a^5, whereupon, by further rotation, the cam projections b^5, will ride down the cam projections a^5, until the first matching teeth or corrugations contact. Then, by the application of sufficient force the plug may be further rotated, the corrugations of the plug riding over the tops of the corrugations of the bushing and gradually compressing the rubber packing or ring C, until the plug has been rotated to its extreme closed or locked position, the resiliency of the ring or packing C holding the corrugations of the plug in engagement with the corresponding corrugations of the bushing. In this condition the rubber ring is compressed and makes a liquid or gas tight joint, while the engaging teeth prevent any accidental backward rotation of the plug, such as would result in leakage of the closure.

It has been common in the art heretofore to provide various forms of bung-bushings, but in all those heretofore known to me, the margin of the circular opening in the top of the plug was not entire, but was provided with notches or the like, in order to permit the insertion and removal of the key. Such a construction has been found to be disadvantageous, since such a plug could more readily be unscrewed by pounding a nail or other simple and readily obtainable article against the edges of one of the notches. That is to say the edges of the notches served as convenient abutments to which impact could be applied to drive the inclined cam surfaces in the unlocking direction. But by making the margin of the circular opening entire the above-mentioned difficulty is avoided.

For the purpose of inserting and removing the plug, a special key as shown in Fig. 1, is provided, this key, in the present example, consisting of two members D, pivotally connected as shown at c', and carrying the arms c^2 which extend laterally from the members D. These arms are held in an extended position by spring c^3, fastened to the inner side of one of the arms by rivets c^4. The arms c^2 carry at their free ends, lateral, oppositely arranged outwardly extending wings c^5 which are arranged to engage with the interior projections b^4 of plug B, as shown in Fig. 2, said wings having rounded upper and lower surfaces. The shape and size of the wings and of the lower end of the key is such that it may be inserted into the hollow plug through the circular opening in the top of said plug, by bringing the arms c^2 together, by means of the members D, or by merely pushing inward on the key. When the wings c^5 have cleared the overhanging top b^2, the members D, upon being released will allow the arms c^2 to be again spread apart, acted on by the spring, and the key will be locked in the said hollow plug, being retained by the overhanging top b^2, which acts against the wings c^5. By turning the key to the right or left, the said wings contact with the interior projections b^4 of said plug and said plug may then be rotated so as to close or open the bung, as the case may be. In order to limit the outward movement of the arms c^2 of the key, a rivet or screw d' is provided which passes freely through an opening d^2 in one of the arms c^2 and is fastened to the other arm at d^3, the head d^4 of the screw keeping the two arms c^2 pressed upon by spring c^3, from spreading apart beyond a certain point. The key may be removed merely by pulling outwardly on it, or by moving the members D to close the arms c^2 together.

Owing to the central circular opening, whose margin is entire, in the top of the plug through which the key is to be inserted, and the difficulty of acting on the radial projections by any instrument other than the proper key, the closure is safe against ordinary tampering in attempts to open it. Furthermore, the difficulty of such unauthorized opening is increased because of the locking teeth, since it is necessary to apply considerable rotary force in order to compress the rubber packing ring and thus partly free the teeth before attempting to rotate the plug to open the closure. The bushing is intended to be screw-threaded into the bilge portion of any barrel, cask or other receptacle and in such case the outer flange is bedded in a recess or counterbore formed in the said barrel or like receptacle.

It is to be particularly noted that in the preferred form of my invention the corrugations on the upper surface of the plug cam

projections vary in size, increasing from the thin or leading portion toward the thick or trailing portion, as shown in Fig. 4, while the corrugations on the bottom of the cam projections of the bushing are arranged to match them. This makes it possible for the desired locking action to take place while at the same time allowing the packing to be compressed gradually during the turning operation in locking. It is to be noted furthermore that the radial edges of the cam projections of the plug are rounded off so that they will not serve as abutments for the application of impact to drive the plug open, thus preventing unwarranted tampering with the closure.

Having thus fully described my invention, what I claim is:

1. In a bung-bushing closure, a bushing having an interior seat, a cam inside said bushing and having inner inclined surfaces, a hollow plug arranged to enter said bushing, said plug having cam projections arranged to engage the cam projections of the bushing, projections in its interior, and a top overhanging said projections and having a central circular opening whose margin is entire, and an elastic packing ring carried by the plug and arranged to bear against the seat to close the bung.

2. In a bung-bushing closure, a bushing having an interior seat, and cam projections inside said bushing, and having inner inclined surfaces provided with corrugations, a hollow plug arranged to enter said bushing, said plug having cam projections arranged to engage the cam projections of the bushing and provided with corrugations mating with the corrugations of the bushing, projections in the interior of said hollow plug, and a top overhanging said projections and having a central circular opening whose margin is entire, and an elastic packing ring carried by the plug and arranged to bear against the seat to close the bung.

3. In a bung-bushing closure, a key, consisting of two members having two lateral, extending arms, said arms having lateral oppositely arranged wings in its free ends, yieldable means for holding said arms in an extended position, and means for limiting the outward movement of said arms, in combination with a hollow plug having interior projections for engaging with the wings on said key, and an overhanging top for retaining the key and plug in a locked position, said plug carrying an elastic packing ring, and arranged to be entered and locked in a bushing, to close the bung.

4. In a bung-bushing closure, the combination with a bushing and a hollow plug fitting within said bushing, said bushing and plug being formed to interlock upon rotation of the plug relative to the bushing, of stops or projections within the plug adapted to be engaged by suitable means for rotating the plug, and a top overhanging said projections and having a central circular opening whose margin is entire.

5. In a bung-bushing closure, the combination with a bushing having interior cam locking surfaces, and a unitary hollow plug fitting within said bushing and having cam surfaces arranged to interlock with the cam surfaces of the bushing upon suitable rotation of the plug, of stops or projections on the interior walls of said plug, and a top overhanging said projections and having a central circular opening whose margin is entire.

In witness whereof I have hereunto affixed my hand this 2nd day of July, 1912.

CHARLES F. TERNEY.

Witnesses:
M. C. MASSIE,
JOHN H. SIGGERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."