July 12, 1938. C. A. F. KELLY 2,123,782

DISCHARGE CISTERN FOR WATER CLOSETS AND THE LIKE

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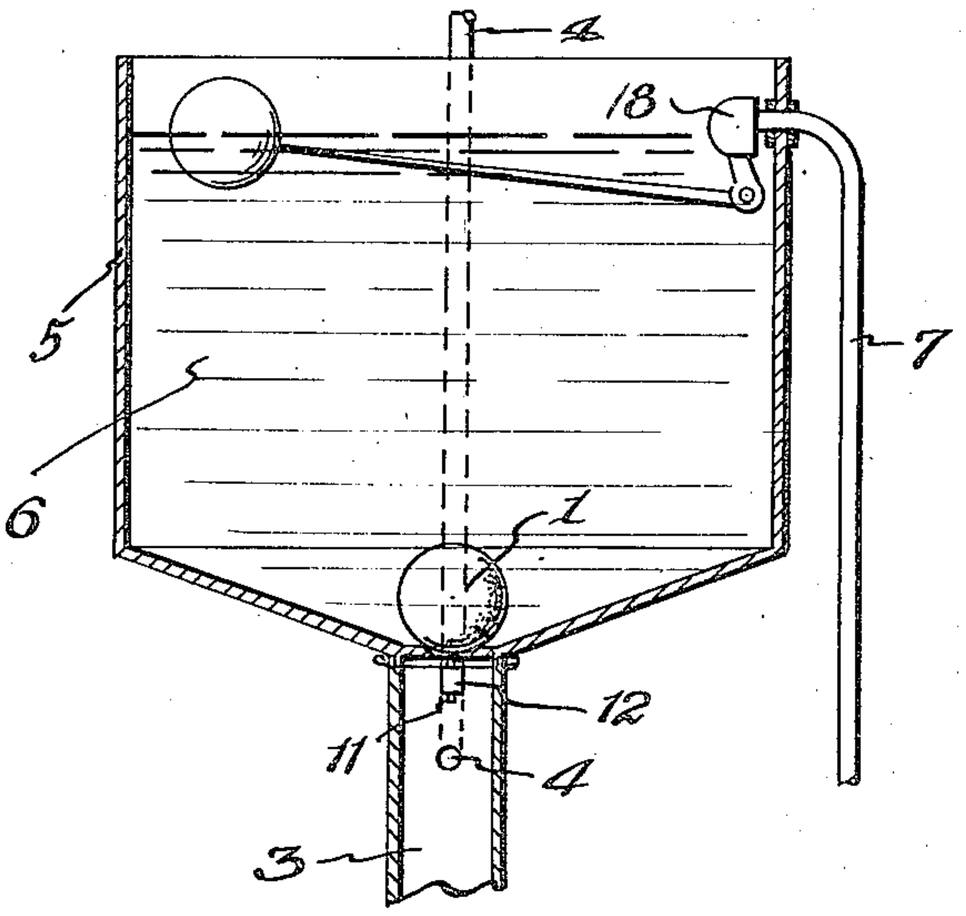


Fig. 1.

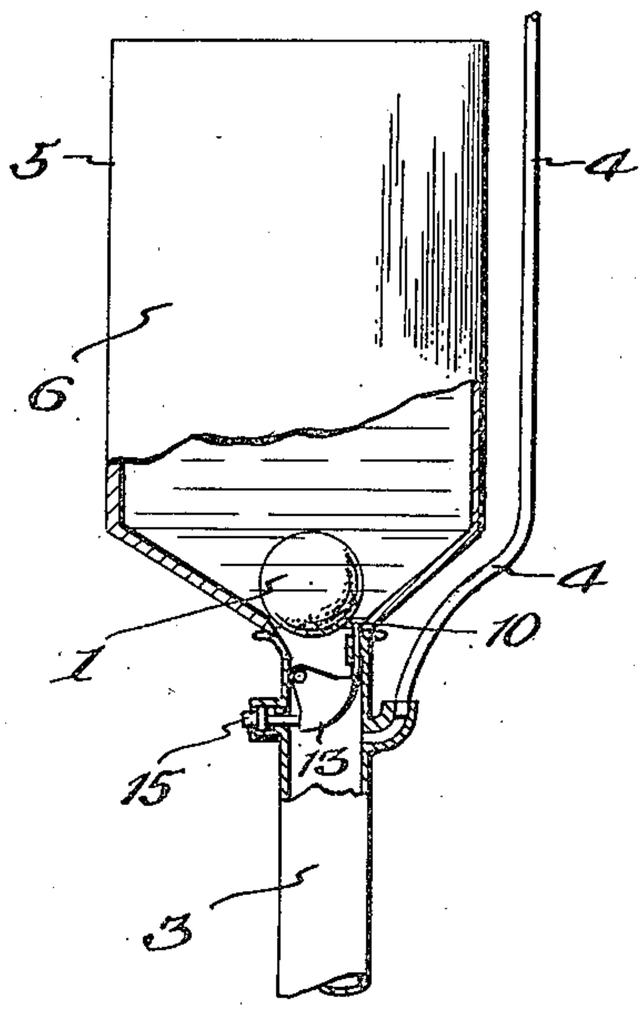


Fig. 2.

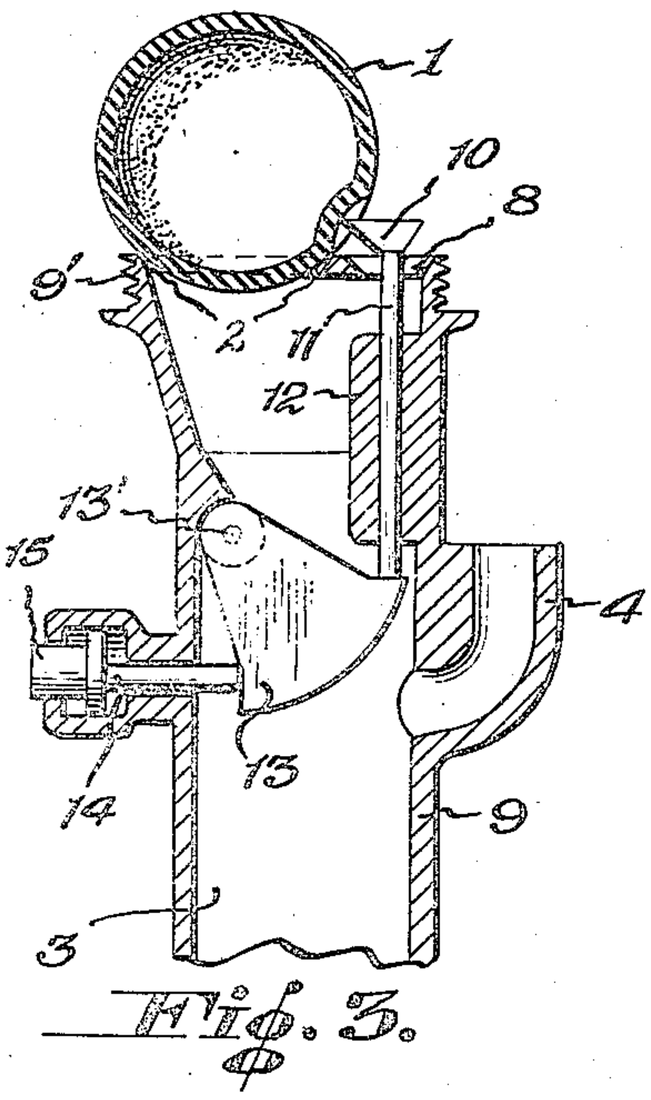
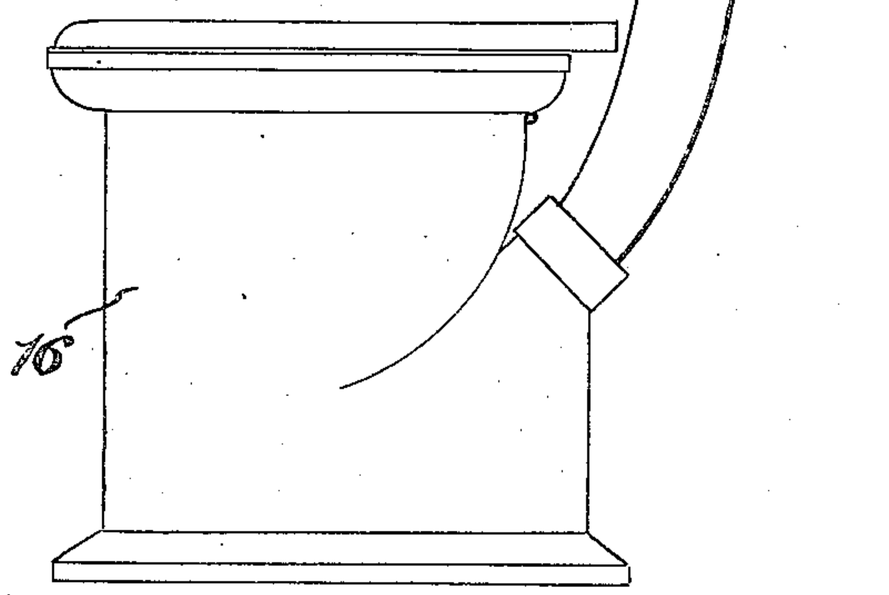


Fig. 3.



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DISCHARGE CISTERN FOR WATER CLOSETS AND THE LIKE

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1 Claim. (Cl. 4—56)

This invention relates to a new system of cisterns provided with a free sphere or ball closure, intended preferably for washing water closets and upright urinals, to clean same by means of a water discharge whenever required.

It is known that the apparatus used heretofore for the same purpose have serious disadvantages, such as a complicated mechanism which renders them easy to damage, the fact that they are very noisy, waste too much water each time they discharge, and are expensive.

To overcome these drawbacks, as well as others found in practice, I have devised an apparatus which advantageously replaces those known up to the present, due to the fact that same has been provided with a sphere or ball closure 1, entirely free, which closes the mouth 2 of the discharge conduit 3 by dragging and also by the suction caused by said conduit 3 upon the descension of the discharge water column and the narrowing of the feed air passage supplied for the normal operation through an external branch-pipe 4 communicating with said discharge conduit 3.

It is known that for similar purposes it has been attempted to use a discharge cistern provided with a closure having a sphere or ball suspended from a chain, in order to raise the same and separate it from the mouth of the discharge conduit, to cause the emptying of the cistern. Such closure offers the difficulty that upon the sphere or ball floating within the receptacle attached to a chain, the latter becomes entangled with the arm of the float of the admission valve and ceases to operate normally.

A further drawback is that due to the continued use of the same sphere or ball, the lower hemisphere wears out and provides a deficient closure, causing losses of water by the discharge conduit.

For this reason, with the use of an entirely free sphere or ball it is not possible for the same to fit in the arm of the admission valve or to wear out in a determined hemisphere, as the sphere or ball remains completely free it will seat on any side on the closing mouth 2, due to the fact that said sphere or ball is not held by chains or other similar means.

In order that the invention may be more clearly understood and easily carried into practice, the same has been illustrated by way of example and in a preferred embodiment in the accompanying sheet of drawings, wherein the same reference characters indicate like or corresponding parts throughout the same.

Figure 1 shows said cistern with the free sphere or ball, in a sectional vertical view taken through the axis of the discharge conduit 3 and the feeding pipe 7.

Figure 2 is a partial vertical section of the same device taken through the axis of the discharge conduit 3 and suction pipe 4, as well as of the cistern 5. This figure shows a further important detail, which consists in arranging the discharge conduit 3 in a straight and substantially vertical position, thus eliminating the curves which are characteristic of the discharge conduit used up to the present and which causes a great loss in the speed of the water column during its discharge fall through the conduit 3 of pipe 9; and

Figure 3 shows a detail of the mechanism of the discharge valve with its corresponding button 15 to actuate the thrower or plunger 10 the conical head of which eccentrically pushes the ball 1 to cause the same to leave the seat 2 of the discharge valve. This figure shows the manner in which the thrower plunger 10, before pushing the ball 1, opens the valve seat 8, in order that the excess pressure on the water contained in the cistern 5 may, in case a cistern of the hermetically closed type is used instead of an open one, may be released before causing the displacement of said ball 1 which closes the mouth 2.

This apparatus is constituted by the following main parts and elements:

A free, hollow sphere or ball 1 preferably made of rubber and made lighter than the water. This sphere is intended to close the orifice 2 or mouth of the discharge conduit 3, communicating with the tubular discharge extension 9.

4 is a branch pipe which extends with its end towards the upper part of cistern 5 while its lower end communicates with the discharge conduit 3. Upon the sphere or ball 1 seated in the orifice 2 to close the latter and being maintained therein by suction, said pipe 4 serves to avoid the interruption of the air feed in the conduit 3, thus allowing the column of water to descend normally, without causing troublesome noises, as the liquid forming the column suffers no interruption during the discharge process.

5 is a cistern with or without cover, the chamber 6 of which stores the water supplied through a piping 7 with the respective inlet and valve 18 governed by a float of any suitable kind.

This cistern may be of any suitable shape, but the bottom thereof is provided with an inclination converging towards the mouth 2 communicating with the conduit 3 of the tubular extension 9. The conduit 3 is preferably straight or following a slight curve from cistern 5 until it joins at 9''

with the water closet 16 or the like, thus avoiding the loss of speed of the discharge water column.

Said cistern 5 is preferably made of cast iron, forming a single piece with the conduit extension 9, or provided at the bottom thereof with a threaded pipe to apply the tubular extension 9 with the discharge valve mechanism, by means of a thread as at 9', Fig. 3.

Said cistern may be of the open or of the hermetical type, and to make the use of both these types possible, a discharge orifice 8 has been combined with the plunger or thrower 10, to release the excess pressure from the chamber 6 of the cistern 5, when the button 15 is pushed to cause the discharge and thus facilitate the displacement of the ball 1 when the same closes the mouth 2 and an excessive pressure acts on said ball.

A suitable plunger or thrower 10 of any type is arranged inside the conduit 3 of the extension 9, which may operate directly towards the centre of the ball 1 or eccentrically, to push the sphere or ball 1 to leave the mouth 2 at the moment of causing the discharge of the water contained in chamber 6 of the cistern.

Preferably, the thrower or plunger 10 is of the rod type with a shank 11 having axial displacement, and slidable in a guide 12 and actuated by an eccentric 13 oscillating on an axle 13' on being actuated by a stem 14 with a push button 15, but as already stated, any suitable thrower may be used.

16 is the water closet or any other appliance to which the water discharge of said cistern is applied.

It is evident that in carrying the invention into practice, several modifications in construction and detail may be introduced without departing from the scope of the invention as clearly set forth in the appended claim.

What is claimed is:—

A discharge cistern for water closets and the like, comprising a container having a bottom outlet, a conduit connecting said outlet with the closet, a free resilient ball adapted to yieldably engage the edge of said outlet and close the opening leading to said conduit, a plunger movably mounted at one side of said conduit and having one end thereof positioned adjacent to the side of the center of said ball, manually operable means adapted to move said plunger whereby said ball is rolled from the opening leading to said conduit to cause the discharge of said cistern into the closet.

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