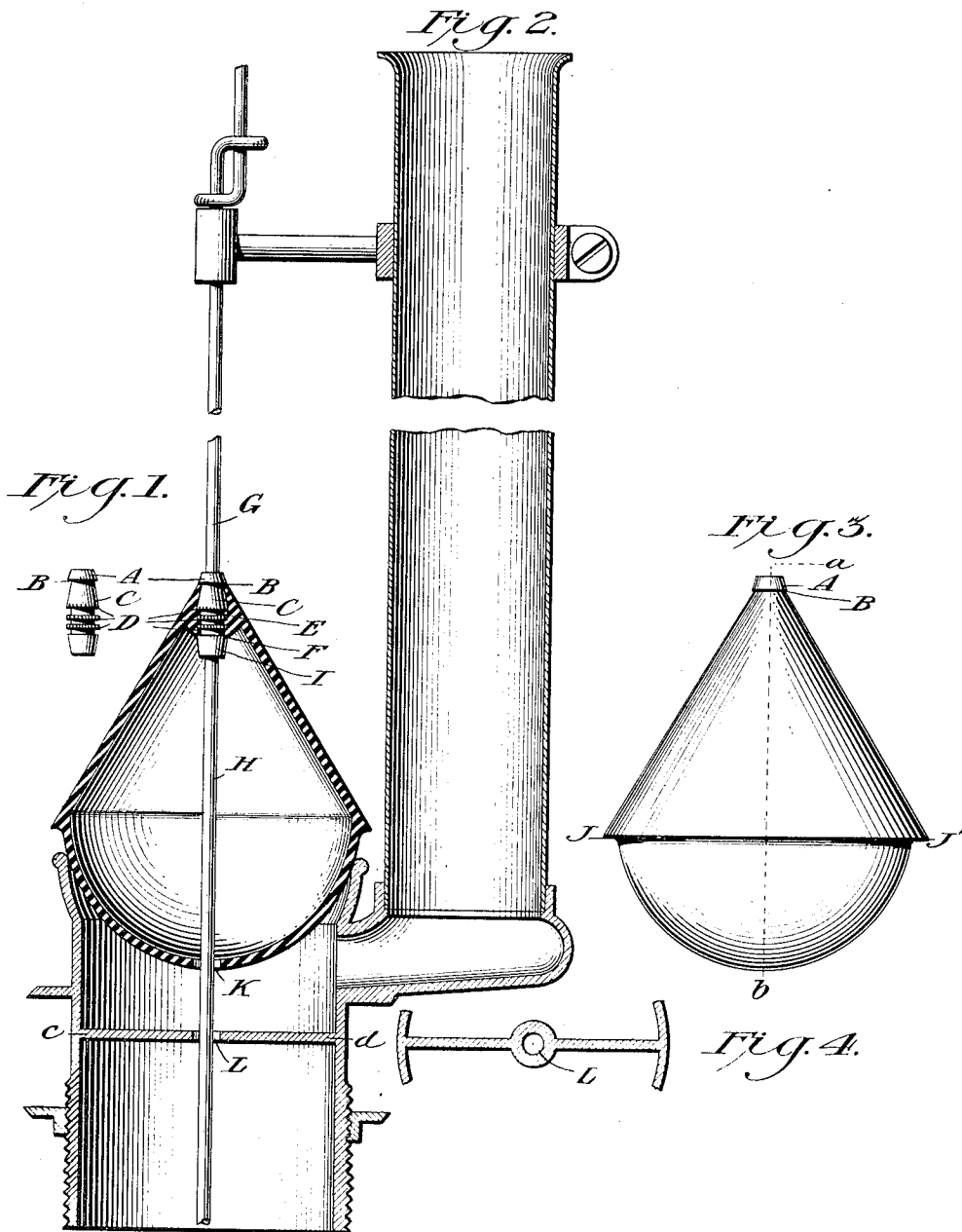


M. B. MAHURIN.
 FLUSHING VALVE.
 APPLICATION FILED DEC. 28, 1907.

944,098.

Patented Dec. 21, 1909.



Witnesses:

Wm. J. Scham.
 Frederick S. Harmer.

Inventor:

Melville B. Mahurin

UNITED STATES PATENT OFFICE.

MELVILLE B. MAHURIN, OF MUSKINGUM TOWNSHIP, WASHINGTON COUNTY, OHIO.

FLUSHING-VALVE.

944,098

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed December 28, 1907. Serial No. 408,366.

To all whom it may concern:

Be it known that I, MELVILLE B. MAHURIN, a citizen of the United States, residing in Muskingum township, in the county of Washington and State of Ohio, have invented a new and useful Flushing-Valve, of which the following is a specification.

My invention relates to improvements in flushing valves, intended to float to the surface when relieved from the pressure of the liquid, being of a buoyant nature, used in closet tanks or reservoirs for flushing closet bowls and other similar uses.

The objects of my improvements are as follows. First, to provide a valve of suitable material, preferably of rubber, with a metal spud, threaded at one or both ends, one thread for the lift wire and the other, when necessary, for the guide wire, the spud being of such construction and shape that it cannot be removed from the valve under the ordinary conditions of use, by the ordinary strain of the lift wire or by the pressure of the liquid in which it is being used. Second, to provide a valve of suitable material, preferably of rubber, of such form and construction that it will not become changed in form when in use, to such an extent that it will not perform the work for which it was intended. Third, to provide facilities in a valve of suitable material, preferably of rubber, for the insertion or application of a guide wire to work in conjunction with a guide bar in the passage way of the seat, necessary under certain conditions. Fourth, to provide a valve of suitable material, preferably of rubber, of minimum size with maximum flushing capacity, with minimum leverage required to lift it off the valve seat, when the operation of flushing is performed. I attain these objects by the improvement illustrated in the accompanying drawing, in which—

Figure 1 is an elevation of the spud to which the lift and guide wires are attached. Fig. 2, a vertical cross section of the valve resting on the valve seat, showing the passage way closed, this cross section being on the line *a, b*, in Fig. 3. Fig. 3, a side view of the valve, the upper portion cone shaped. Fig. 4, a top view of the guide bar on the line *c, d*, Fig. 2.

Similar letters refer to similar parts throughout the several views.

The outwardly extending and exposed end

of the spud, to which the lift wire is attached, is shown at A, Figs. 1, 2 and 3.

The material of which the valve is made, instead of extending to the top or end of the spud, is forced under the outwardly extending end as shown at B, thus making a better, stronger and more durable union between the two parts, the overhanging part of the spud serving as a cap and protection to the union of the two parts. The concealed portion of the spud is grooved, the outer edges and surface of the parts between the grooves, and the part indicated by the letter C being milled similar to the edges of U. S. silver coins. The object of these milled edges is to provide a suitable surface to which the material can firmly adhere so as to prevent the spud from turning or becoming loosened.

In the grooves D Figs. 1 and 2, is wrapped or laid a light strong thread or wire the one saturated, the other coated respectively with a cement, rubber preferred, and while still moist, the material E, Fig. 2, in a plastic state or suitable condition, is pressed around the spud, firmly uniting with the cement coated thread or wire, thus forming a solid and non-elastic fastening for the spud. The material in which the spud is embedded extends from the point B to the point F, Fig. 2 forming such a fastening for the spud that it cannot be removed except by special effort for that purpose.

The upper and lower ends of the spud A are bored and threaded. The upper end to receive the end of the lift wire G. The lower end to receive the end of the guide wire H. The lower end of the spud extends below the material of which the valve is made, from the point F, this end being on the inside of the valve.

I make the upper portion of the valve in the form of a circular cone, the base of the cone in combination with the lower half of what is known as the Douglas rubber ball valve, being the valve proper. The apex of the cone being the spud into which the lift wire is screwed or otherwise fastened. It will be observed that the strain exerted upon the valve in lifting it from the seat by means of the lift wire, in order to open the passageway, is direct and is distributed through imaginary straight lines extending from the spud A to the base of the cone J. J'; that the strain thus exerted does not

tend to distort or change the conical form, but rather tends to preserve it so that the tendency through continual use, to change the form of the valve, making it necessary to replace it with a new and perfect one is entirely overcome. The continual pressure of the liquid on the valve when closed, augmented by the suction tending to draw it into the passage-way, is another fruitful source of injury to the valves now in prevalent use. By means of the cone shape provided, this tendency is entirely overcome, and makes the life and use of the valve practically unlimited.

It will be observed that I have retained in my improved valve the form of the lower part of the well known "John Douglas valve". This valve was in the form of a rubber ball, hollow inside to give it buoyancy. The upper half of my valve is a circular cone and the lower half a hemisphere. I retain the hollow feature for the same purpose. The additional advantage of my improvement is apparent when it is known that it overcomes the tendency of the old style valves to stick in the seat, often, to such an extent that in the attempt to lift it from its seat, the spud A is pulled out of its fastening. At times the valve, when the closet bowl is being flushed, fails to reseat itself, caused by the in-rush of the water, (which is to replace that which has just been used in the operation of flushing,) striking the side of the valve and pressing it against the edge of the valve seat. When this occurs, the water continues to flow out of the closet tank or reservoir as fast as it enters and continues to do so until the valve is again lifted and drops back on its seat. To prevent this, I provide a guide wire H, Fig. 2, which screws into the lower end of the spud at I, Fig. 2, the end of the guide wire having been passed through the small round opening in the lower part of the valve at K, Fig. 2, the lower end of this guide wire passing through the guide bar at L, Figs. 2 and 4. With this arrangement it is an impossibility for the valve to fail to close the passage way at the proper moment.

I do not limit the form of the spud A to the exact shape as shown. This may be any suitable shape adapted to the method of fastening as specified.

I do not limit the spud A to the specification of the upper and lower ends being bored and threaded. The improved method of securely fastening it to the valve is what I also claim.

Figs. 1, 2, 3 and 4 are full sized drawings of my improved valve.

I am aware that flushing valves have been

made with the guide wire and guide bar substantially as shown in my drawings. I claim these only in combination with my improved method of securing the spud in the valve and the spud threaded at the lower end for the guide wire, when necessary. The improved valve is intended to be used either with or without the guide wire, as emergency may require. There is no such valve, as far as I have been able to ascertain, in use to-day.

I am aware that others have heretofore made valves somewhat similar in form to mine, notably Ira P. Clarke, Patent No. 658,139 and British patent to James White No. 20,651 Oct. 12th, 1905. I claim a valve having its lower part of hemispherical form and its upper part a circular cone, having a base of larger diameter, and that such construction has superior advantages to the valves described in the above patents.

Having fully described my invention, I desire to secure by Letters Patent the following claims:

1. In a flushing valve, the combination of a grooved metal spud embedded in a portion of the valve and non-elastic material encircling said spud and united with said portion of the valve, substantially as and for the purpose described.

2. A rubber flushing valve of the floating type consisting of a hemispherical portion and a conical portion, the diameter of the conical portion being greater than that of the hemispherical portion.

3. In a flushing valve, the combination of a hemispherical part and a circular cone having a base of larger diameter than the hemispherical part, a metal spud embedded in a portion of the valve, and non-elastic material encircling said spud and united with said portion of the valve, substantially as and for the purpose described.

4. In a flushing valve, the combination of a grooved metal double spud embedded in a portion of the valve, and non-elastic material encircling said spud and united with said portion of the valve, substantially as and for the purpose described.

5. In a flushing valve, the combination of a hemispherical part and a circular cone having a base of larger diameter than the hemispherical part, a grooved metal double spud embedded in a portion of the valve and non-elastic material encircling said spud and united with the valve, substantially as and for the purpose described.

MELVILLE B. MAHURIN.

In presence of—

ALLEN E. KILE,

FRANK R. MAHURIN.