

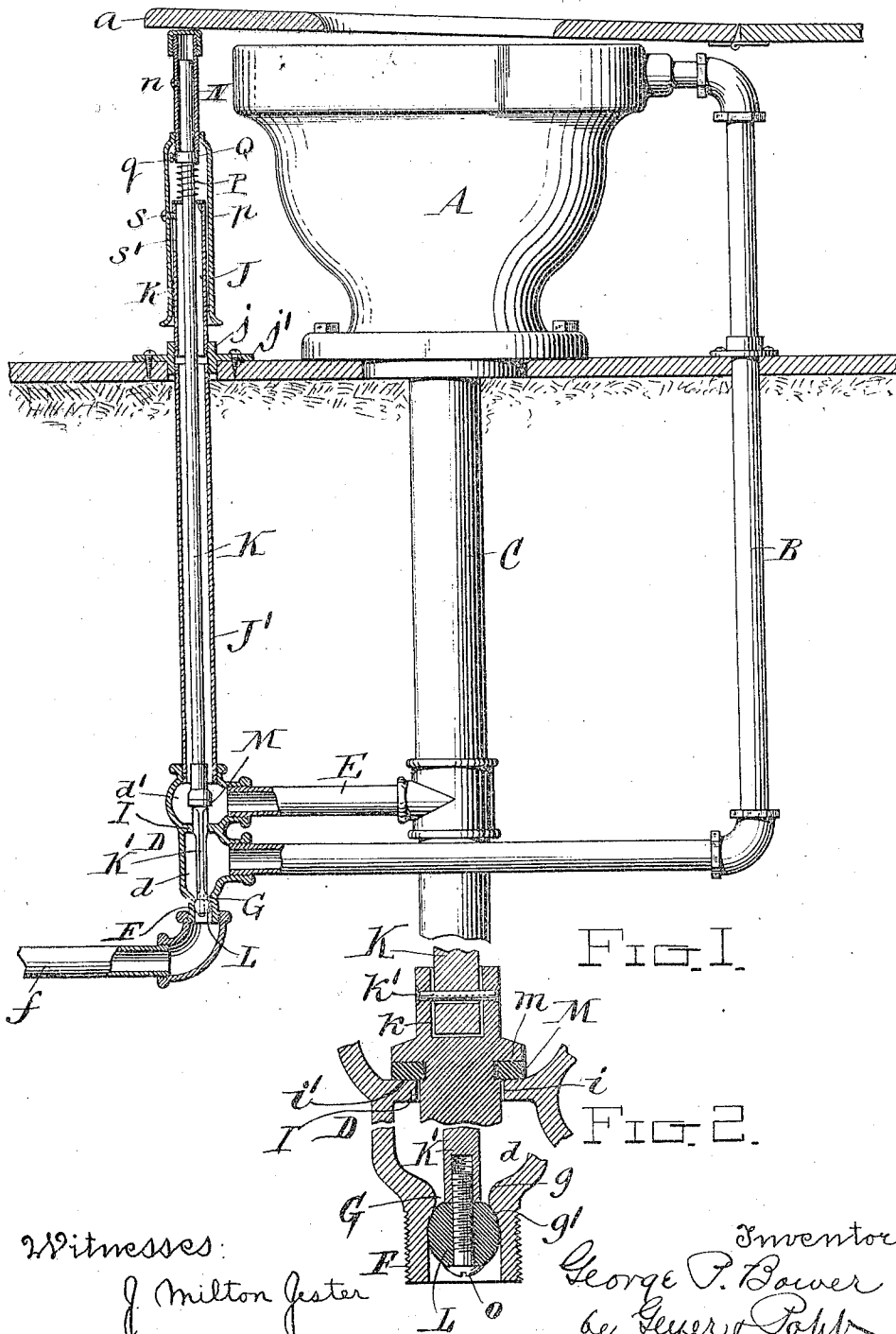
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VALVE.

APPLICATION FILED OCT. 25, 1909.

1,015,132.

Patented Jan. 16, 1912.



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UNITED STATES PATENT OFFICE.

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VALVE.

1,015,132.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed October 25, 1909. Serial No. 524,338.

To all whom it may concern:

Be it known that I, GEORGE P. BOWER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Valves, of which the following is a specification.

This invention relates more particularly to that class of valves which are known as "and freezing valves" and which are intended to be placed in the ground below the freezing line and drain the service pipe of a water closet to the sewer after the latter has been flushed, so as to prevent this pipe from bursting by freezing of water therein.

The object of this invention is to provide a simple, durable and efficient valve for this purpose which can be produced at low cost and which can be readily repaired without necessitating digging the valve casing out of the ground for this purpose.

In the accompanying drawing: Figure 1 is a vertical section of a water closet equipped with my improved valve. Fig. 2 is a fragmentary vertical section, on an enlarged scale showing the upper and lower stoppers of the valve and their seats on the valve casing.

Similar letters of reference refer to like parts in both figures.

A represents the bowl of the water closet which is arranged above the ground, *a* the vertically movable seat above the bowl, B the service pipe whereby water is delivered to the bowl, and C the drain pipe whereby the bowl is connected with the sewer.

D represents the casing of the valve which is arranged in the ground below the freezing line and which has a lower service chamber *d* connected on one side with the service pipe B, and an upper waste chamber *d*¹ connected at its side by a branch waste pipe E with the main waste or drain pipe C. At its lower end the valve casing has a water inlet nipple F which is connected with a main water supply pipe *f* and which contains a supply, service or inlet port G which flares upwardly and downwardly from its central part so as to form an upwardly flaring compressing or guide face *g* and a downwardly flaring valve seat *g*¹. Between the upper and lower chambers the casing is provided with a horizontal partition or diaphragm I which has a drain port *i* connecting said chambers and a flat upwardly facing valve seat *i*¹ on its upper side around its port *i*.

The drain port is axially in line with but of larger diameter than the supply port.

J, J¹ represents the upper and lower sections of an upright stand pipe which are arranged respectively above and below the ground and which have their opposing ends connected by a screw collar or sleeve *j* having an external flange *j*¹ which is secured to the floor adjacent to the bowl. The lower end of the lower section of the stand pipe is secured in an opening in the upper end of the valve casing while the upper end of the upper section is arranged below the front part of the closet seat. The bore of the stand pipe sections is greater than the diameter of the waste valve seat on the upper side of the partition between the upper and lower chambers.

Arranged lengthwise within the stand pipe and the chambers and ports of the valve casing is an upright valve rod K, K¹ which extends with its upper end above the stand pipe and is provided at its lower end with a main or supply valve L which is adapted to cooperate with the lower or supply valve seat for controlling the supply port, and above said supply valve with a waste valve M which is adapted to cooperate with the upper or waste valve seat for controlling the waste port. At its upper end the valve rod is provided with a tubular extension N which is adjustably connected therewith by a set screw *n* or otherwise and which bears at its upper end against the underside of the closet seat. The lower or supply stopper of the valve is preferably constructed of rubber or other elastic material in the form of a ball, so that it narrows from its center upwardly and downwardly and secured to the lower end of the valve rod by a screw *o* passing upwardly through this ball into a threaded opening in the rod. In assembling the valve the ball stopper is secured to the rod and expanded by the screw *o*, so that it is of larger diameter than the supply port, and then the ball stopper is pushed through this port from the top to the bottom for bringing this stopper into the proper relation to the supply port seat. While the supply stopper is being pushed through the supply port the same is compressed by the upper flaring compressing face of the lower port, this being possible owing to the powerful pressure which can at this time be applied to the valve rod and lower stopper. But

when the latter has passed below the lower port it again expands so as to engage with the lower flaring valve seat against which it is held by the pressure of water supply against the rear or lower side of the same. This water pressure is less than the power which is exerted in moving the lower stopper through the lower port and is not sufficient to again force the lower stopper upwardly through its ports. The upper or waste stopper of the valve is flat and consists preferably of a flexible washer of leather or rubber which engages with a downwardly facing shoulder *m* on the valve rod. The upward pressure of the water against the lower stopper also holds the seat *a* normally in its elevated position but as the weight of seats varies a supplemental lifting device is provided consisting of a spring *P* which assists in lifting the seat and valve rod and which preferably surrounds the rod and bears with its lower end against a washer *p* resting on the upper end of the upper stand pipe section while its upper end engages with a collar *Q* secured to the rod by a set screw *q*. The last mentioned collar may also be engaged by the lower end of the valve rod extension so as to receive the load on the seat.

R represents a skirt, hood or bell which extends from the valve rod extension downwardly around the upper end of the stand pipe so as to overhang the latter and form a telescopic connection therewith, whereby the joint between the stand pipe and valve rod is covered and liquid is prevented from entering the stand pipe from the top, which otherwise would be liable to rust the parts, so that they would work hard and also clog the parts by freezing in the winter time. The hood or bell is held against turning, and also against detachment from the stand pipe but is free to rise and fall the requisite extent by means of a screw *s* secured to the hood and engaging with a vertical slot *s'* in the stand pipe.

Upon depressing the closet seat the lower stopper is moved downwardly from its seat and the upper stopper is moved in the same direction against its seat, thereby permitting the water from the supply pipe to enter the service pipe and pass to the bowl while the waste pipe is cut off from the water supply. When the seat is free the same together with the valve rod and connecting parts is raised by the spring *P* and the pressure of the water against the lower end of the lower stopper which latter at this time operates as a piston, thereby closing the lower stopper and opening the upper stopper, as shown in Fig. 1. In this position of the parts the water supply is cut off from the service pipe and the latter is connected with the waste pipe, so that any water in the service pipe will drain into the sewer and prevent any of it from

freezing in the service pipe above the frost line. When the lower stopper becomes worn it is only necessary to withdraw the same upwardly from the casing and stand pipe and tighten the screw *o* until the ball shaped lower stopper has been expanded sufficiently to again properly engage its seat when this stopper may be again replaced in the manner heretofore described. The upper valve stopper may also be renewed or repaired upon withdrawing the same together with the valve rod from the stand pipe and valve casing. The bore of the stand pipe is sufficiently large in diameter to permit easy insertion and removal of the valve rod and stoppers, thereby avoiding the necessity of removing the casing from the ground when repairing of the valve stoppers is necessary. For the purpose of permitting the stoppers to seat themselves properly the lower part *K*¹ of the valve rod which carries the stopper is loosely connected with the upper part *K* of this rod, the preferred means for this purpose consisting in forming a socket *k* at the upper end of the lower section *K*¹ and securing the lower end of the upper section *K* in this socket by means of a transverse pin *k*¹.

I claim as my invention:

1. A valve comprising a casing having a lower service chamber adapted to be connected with a service pipe, an inlet port in its lower side provided with a downwardly facing valve seat, and a waste chamber adapted to be connected with a waste pipe and having a waste port which is in line with said inlet port and is provided with an upwardly facing valve seat, and a valve rod arranged in said casing and ports and having a lower stopper adapted to engage said lower seat upon raising said rod and an upper stopper adapted to engage said upper seat upon lowering said rod, said lower port and stopper being of smaller diameter than said upper port and stopper, and said lower stopper being constructed of elastic material of spherical form and of larger diameter than the lower port.

2. A valve comprising a casing having a lower service chamber adapted to be connected with a service pipe, an inlet port in its lower side provided with a downwardly facing valve seat, and a waste chamber adapted to be connected with a waste pipe and having a waste port which is in line with said inlet port and is provided with an upward facing valve seat, and a valve rod arranged in said casing and ports and having a lower stopper adapted to engage said lower seat upon raising said rod and an upper stopper adapted to engage said upper seat upon lowering said rod, said lower port and stopper being of smaller diameter than said upper port and stopper, and said lower port flaring upwardly and downwardly from

its central part, and said lower stopper being constructed of elastic material of spherical form and of larger diameter than the lower port.

3. A valve comprising a casing having a lower service chamber adapted to be connected with a service pipe, an inlet port in its lower side provided with a downwardly facing valve seat, and a waste chamber adapted to be connected with a waste pipe and having a waste port which is in line with said inlet port and is provided with an upwardly facing valve seat, and a valve rod arranged in said casing and ports and having a lower stopper adapted to engage said lower seat upon raising said rod and an upper stopper adapted to engage said upper seat upon lowering said rod, said lower port and stopper being of smaller diameter than said upper port and stopper, said lower port flaring upwardly and downwardly from its central part and said lower stopper being constructed of elastic material and narrowing from its center upwardly and downwardly and being of larger diameter than said lower port.

4. A valve comprising a casing having a lower service chamber adapted to be connected with a service pipe, an inlet port in its lower part which flares upwardly and downwardly from its central part forming an upwardly flaring compressing face and a downwardly flaring valve seat, an upper waste chamber adapted to be connected with a waste pipe, and a waste port which is arranged vertically in line with and constructed of larger diameter than the lower port and which has an upwardly facing upper valve seat, an upright valve rod arranged in said casing and ports and having an upper downwardly facing stopper which is adapted to engage the upper valve

seat upon lowering the rod, a lower elastic ball shaped stopper of larger diameter than the lower port adapted to be forced through said lower port from the upper to the lower end thereof and to be compressed by engaging with said compressing face and to expand below said lower valve seat, and means for expanding said ball stopper.

5. A valve comprising a casing having a lower service chamber adapted to be connected with a service pipe, an inlet port in its lower part which flares upwardly and downwardly from its central part forming an upwardly flaring compressing face and a downwardly flaring valve seat, an upper waste chamber adapted to be connected with a waste pipe, and a waste port which is arranged vertically in line with and constructed of larger diameter than the lower port and which has an upwardly facing upper valve seat, an upright valve rod arranged in said casing and ports and having an upper downwardly facing stopper which is adapted to engage the upper valve seat upon lowering the rod, a lower elastic ball shaped stopper of larger diameter than the lower port adapted to be forced through said lower port from the upper to the lower end thereof and to be compressed by engaging with said compressing face and to expand below said lower valve seat, and means for expanding said ball stopper comprising a screw passing through said lower stopper and entering a threaded opening in the lower end of the valve rod.

Witness my hand this 23rd day of October, 1909.

GEORGE P. BOWER.

Witnesses:

THEO. L. POPP,

ANNA HEIGIS.