

No. 720,022.

PATENTED FEB. 10, 1903.

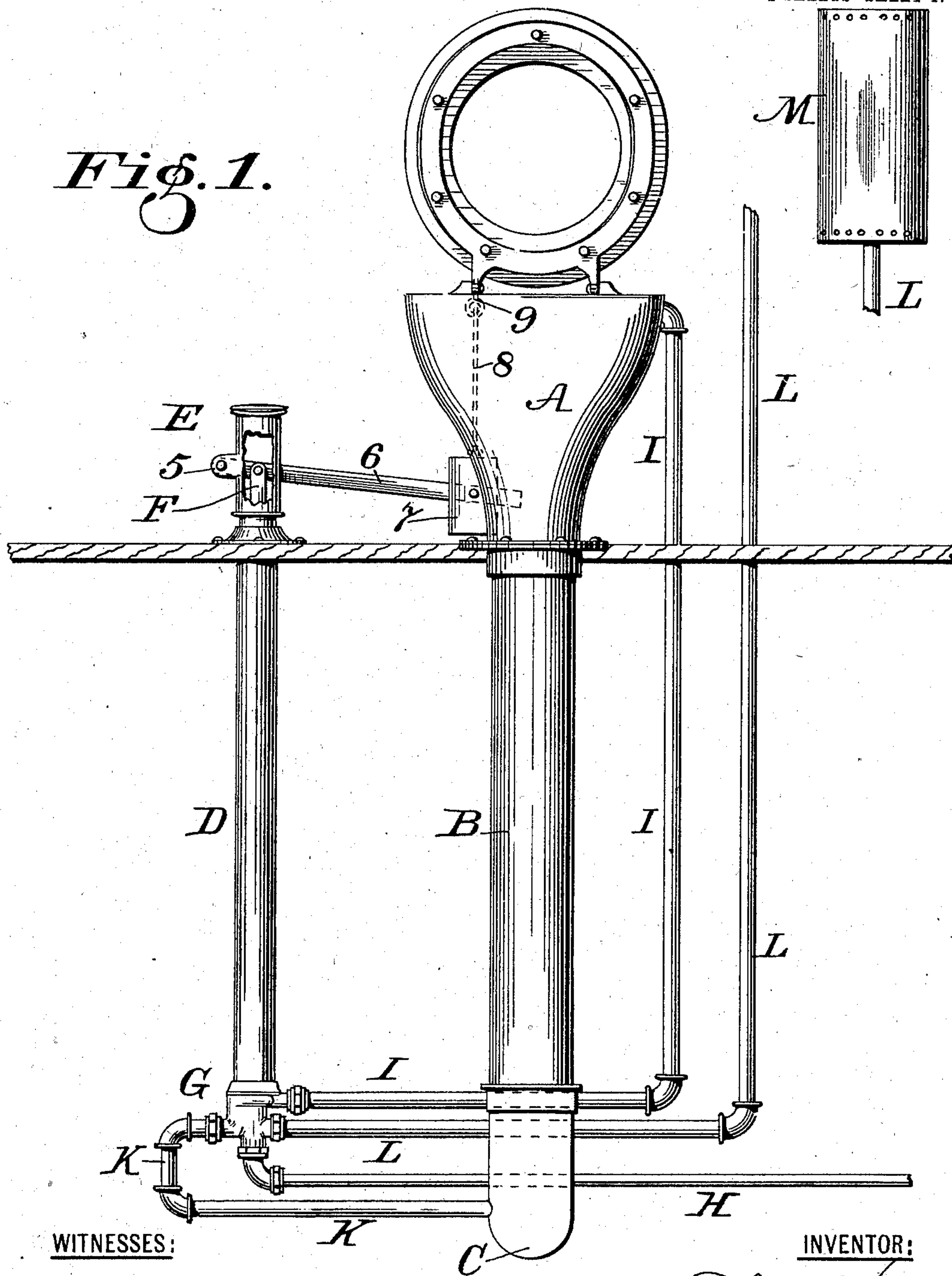
P. HAAS.  
ANTIFREEZING COMPRESSION VALVE.

APPLICATION FILED AUG. 5, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



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Perry Rochin.

**INVENTOR:**

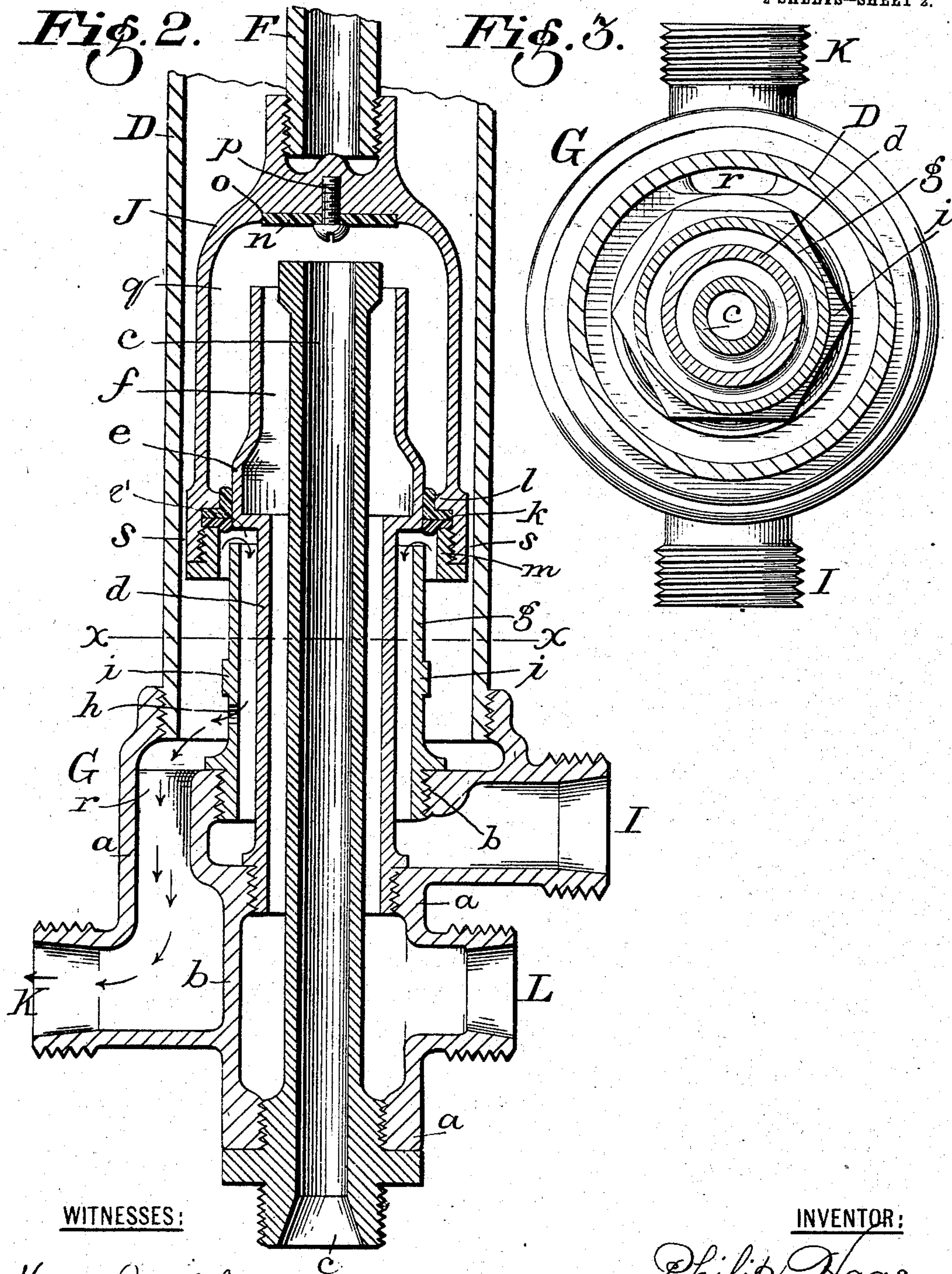
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

PHILIP HAAS, OF DAYTON, OHIO.

## ANTIFREEZING COMPRESSION-VALVE.

SPECIFICATION forming part of Letters Patent No. 720,022, dated February 10, 1903.

Application filed August 5, 1901. Serial No. 70,933. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP HAAS, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Antifreezing Compression-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My present invention relates to an "antifreezing compression-valve," and although more particularly designed and intended to be used in connection with water-closets, for which purpose it is herein illustrated, described, and claimed, it is not limited to this device alone, but is susceptible of being used to great advantage by being fitted to the water-pipes of any device wherein a valve of this nature can be utilized to control and regulate the supply of water.

The main object or purpose of this invention is to provide a valve of simple construction and inexpensive cost of manufacture and one which will after each operation of the device automatically, quickly, and effectively drain off all water from the pipes, thereby preventing their freezing up and bursting, which is so frequently the case, thus doing away with the objectionable "valve-pit," to which the frost has a ready access and freezes both valves and pipes.

A further object consists in constructing a valve that, while accomplishing the object or purpose just above referred to, will also control and distribute the water and flush the hopper or bowl, thereby dispensing with the usual "hopper or bowl valve."

Another object of this invention is in providing a valve of this class in which any of the parts may be readily and quickly repaired without the disconnection of any of the pipes.

My invention consists in its construction of a valve proper having certain novel and peculiar features and an upper pendent portion or member which is slightly bell-shaped in contour and resembles an inverted cup

and which is provided with a gasket or packing-ring, (preferably of leather,) thus causing it to act as a valve when moved up or down as the device is operated, said valve being inclosed in a large tube or pipe.

The invention also provides means for receiving the water direct from the city main, and conveying and distributing it to the compression-tank; also means for storing and supplying, and constantly keeping and distributing air to the tank and its pipe, and keeping a constant circulation of air through the entire valve, and the facilitating of the absorption of air by the water; also means for closing off said supply of water, and opening communication for said supply of water to pass from the tank to the hopper direct; also means for quickly and simultaneously draining and carrying off the water, out of all the pipes and the valve, after thoroughly and effectively flushing and cleansing the hopper or bowl, as will be more fully described herein-after and pointed out in the subjoined claims, in accordance with the statutes in such cases made and provided therefor.

In the annexed drawings, forming a part of this specification, and wherein like letters and numerals of reference refer to the same parts wherever they occur throughout the several views, for the purpose of illustrating the practical application of this invention I have shown my valve as connected to the pipes of a water-closet, for which device it is more especially designed and adapted, and in which—

Figure 1 is a front elevation of a water-closet having my antifreezing compression-valve connected in proper position to the pipes and showing the closet-seat raised in its normal position when not in use and just after the hopper has been or while it is being flushed. Fig. 2 is a full-sized view of my antifreezing valve in vertical section and showing the stem and pendent portion raised, so as to open communication from supply-pipe to compression-tank; and Fig. 3 is a full-sized view of same in cross-section, taken on line *xx* of Fig. 2.

In describing my invention and referring in detail to the different parts thereof as shown throughout the various views of the accompanying drawings by means of the let-



ters and numerals of reference as aforesaid, A refers to the hopper or bowl of the water-closet and may be of any well-known or preferred style or form of construction, which is  
 5 firmly and suitably secured to the floor and having in alinement therewith and also secured to the floor, preferably by the same fastenings, the soil-pipe B, provided at its lower end with the usual trap C. A large  
 10 tube or pipe D extends upward a short distance through the floor, being securely and firmly held in position by a collar bolted or otherwise attached to said floor, or any other suitable means may be employed. Fitted to  
 15 the top of tube or pipe D and somewhat similar thereto, so as to form an extension thereof, is a cap E, (see Fig. 1,) which extends a sufficient distance above the floor and is provided with a small lug, to which is  
 20 pivoted, as at 5, the end of a lever 6, said lever having pivoted to it stem F, located and moving inside of said cap and said tube or pipe, said stem being raised, as shown in Fig. 2, when the water-closet seat is lowered or  
 25 depressed, and said stem being lowered, as shown in Fig. 1, when said closet-seat is raised and assumes its normal position through the medium of weight 7, located near the opposite end of lever 6, as will be more fully de-  
 30 scribed hereinafter, said weight having attached to it a rod or wire 8, which is connected to a curved arm or short lever 9, suitably arranged and adapted in an ordinary manner so as to actuate the closet-seat and  
 35 keep it raised when not in use.

Antifreezing compression-valve G has an outer casing or shell *a* and an interior wall or partition *b* and in this instance is intended to be located in the ground at a suitable distance below the surface thereof, so as to readily connect with supply-pipe H, which is shown in Fig. 1 as broken off and leading directly from the city water-main through the medium of tubular stem *c*, which is held firmly  
 40 in position by screw-threads to outer casing *a* at its lower end and also has a screw-threaded connection with supply-pipe H, said supply-pipe and said tubular stem thus conveying the water from the city main to the valve  
 45 by which it is controlled and distributed. Detachably connected or screwed at its lower end to outer casing *a* and interior wall *b* of said valve and located concentrically with and externally of and sufficiently larger than tubular stem *c*, so as to leave a suitable pas-  
 50 sage-way between for water and air, is another tubular stem *d*, provided at its top with an enlargement *e*, which terminates within a short distance of, and thus leaving a space or short  
 55 passage-way for air and water below, the top of tubular stem *c* when the pendent-portion valve is depressed, as will be hereinafter described, said enlargement *e* forming on its inside an air and water chamber *f*, which com-  
 60 municates directly with the air and water passage or channel just below it and of which it is a continuation, the supply of air being

retained in said chamber *f* long enough to accumulate in sufficient quantity to increase the pressure upon the water, thus accelerating the velocity of said water and assisting  
 70 in discharging and draining all water from the valve into waste-pipe K, as will be more specifically referred to hereinafter. Tubular stem *g* is detachably connected or screwed to  
 75 interior portion *b* and is located concentrically with and externally of and sufficiently larger in circumference than tubular stem *d*, so as to leave a passage-way for air and water, which affords communication through  
 80 flush-pipe I to hopper or bowl A and also permits and serves for the return of the unused or surplus portion of said water, which will then drain off through port *h*, located in said tubular stem just below the nut or wrench-  
 85 catch *i*, with which said tubular stem is provided for the purpose of turning said stem when attaching or detaching it, said water as it continues on its course also passing through  
 90 port *r*, (see Figs. 2 and 3,) thence down and entirely out of the valve, (see arrows, Fig. 2,) and is carried off through waste-pipe K into trap C and thence to the sewer. The relative  
 95 increased size or cross-sectional area of each of the tubular stems one over the other and the passage-ways thus left between, also the nut or wrench-catch, are clearly shown in Fig. 3. The tubular stem *g* extends to within a short  
 100 distance of the enlargement *e* of the stem *d*, thereby leaving an annular open connection between the space within the upper or pendent portion of the valve J regardless of the position of the said valve. The main valve  
 105 J is slightly bell-shaped in contour, having approximately the shape of an inverted cup, and has the interior of its lower end screw-threaded to receive the collar *m*. The valve  
 110 also has an inwardly-projecting annular flange *l*, between the under surface of which and the upper edge of the collar *m* is provided a gasket or packing-ring *k* (preferably formed of leather) and preferably composed of two  
 115 segments or parts held in position by the collar *m* and flange *l*. As the valve J bears a spaced relation to the tube D and the stem *g*, the packing or gasket *l* serves to position the valve J, as well as to form what I term the "supplemental" or "discharge" valve. The valve  
 120 J is further provided with a recess *o* at a point in vertical alinement with the supply-pipe *c*, and within the recess is secured a disk *n*, removably held in position by the screw *p*. The disk *n*, cooperating with the upper end of the supply-pipe, forms the supply-valve of the  
 125 pendent portion or valve J, said supply-valve controlling the passage of the water from the source of supply to the device. From this it will be understood that when the closet-seat is down while the closet is in operation the parts will assume the position shown in Fig. 2.  
 130 The water from the source of supply passes into the valve J through the pipe H and stem *c*, the valve *n* being open, during which operation the air within the valve J, together with that



located in the connections between the valve and the tank M, will be forced toward the tank and be gradually compressed therein. When the water after it passes from stem *c* down into chamber *q* rises until it has reached the level of the upper end of the stem *d*, (its passage from the valve J at the lower end of the valve being closed by the packing *l*,) it will pass into the annular space between the stems *c* and *d* and out through the pipe L to tank M, the air of course, having no outlet, being still further compressed, and this will continue until the pressure in the tank or cistern M equals that of the source of supply. This operation, as just above described, takes place while the seat is down and the closet in use, the weight being raised. When the seat is released, it is raised by the weight, and at the same time the valve J is forced downward until the supply-valve is closed by the seating of the disk *n* on the upper end of the supply-pipe. This movement of the valve J also causes the supplemental or discharge valve *k* to move downward, passing the annular port formed between the enlargement *e* and the upper end of the stem *g*, whereupon the pressure within the tank M, being greater than that of the atmospheric air located in the passage-way leading to the bowl, will cause the water to be forced backward and through the annular port *e'* into the space between the stems *d* and *g* and into the pipe I leading to the bowl, thereby causing the latter to be flushed, the contents passing through the soil-pipe B into the tube C, as usual. The water which does not pass through the bowl when the latter is on a higher plane than the device gradually passes out through the opening *h* in the stem *g* into the waste-water pipe K.

In Fig. 2, the valve J for the purpose of preserving the clearness of the drawings, and not complicating this view, is shown in an opposite position from that just described, and in a raised position, which is caused by the closet-seat being depressed, thus causing lever 6 and stem F to be raised and assume just an opposite position from what these parts are shown in Fig. 1, and can be clearly and readily understood from the drawings.

The lower end of large pipe D is screwed or detachably connected to the top of outer casing *a* of valve G, said pipe inclosing and protecting the upper portion of all the tubular stems just described, also the valve which moves loosely in said large pipe, by reason of an air space or passage *s*, which not alone permits of air to always circulate in the valve, so as to assist in preventing the formation of any air-pressure greater than the atmospheric air within the passage-way leading to the bowl, and thereby permitting a maximum amount of pressure to be exerted from the tank M, but also prevents any slight amount of rust that might accumulate on the inside of pipe D from impeding or stopping the free movement of valve J.

When the water-closet seat is depressed or thrown down while the closet is being operated, curved arm or short lever 9 will be raised, also rod or wire 8, weight 7, and lever 6, and said lever 6 will in turn raise stem F and valve J will rise to the position shown in Fig. 2, and disk *n* will be removed from its seat on the top or mouth of tubular stem *c*, and the water in said tubular stem which has been forced through supply H from the city main will by reason of its pressure be thrown over and down into the bottom of chamber *q*, and as said water rises it will displace the air which has accumulated in said chamber above it and carry said air with it as it passes down through chamber *f* and the waterway of tubular stem *d*, thence through tank-pipe L up into compression-tank M, and as said tank is air-tight the air forced up therein by the water will be compressed into a cushion in the top of said tank after a sufficient quantity of water has been stored therein, when, the pressure being removed from the water-closet seat, said seat will immediately be thrown up in its normal position (see Fig. 1) by means of the weight connected to end of rod or wire, which is in turn connected to curved arm of the seat, and at the same time lever 6, being connected to the weight, will depress or force stem F and valve J down until disk *n* will rest or be seated firmly on the top or mouth of inner tubular stem *c*, thus cutting off the flow of water coming through supply-pipe H from the main, and at the same time gasket *k* will rest in position just below the space or waterway left between the top of tubular stem *g* and enlargement *e*, and communication will thus be again opened from chamber or air and water reservoir *q* to outer tubular stem *g*, and said water will be forced by the air-pressure and its weight down into flush-pipe I and up into hopper or bowl A, thoroughly flushing and cleansing said bowl and carrying all matter down through the soil-pipe and trap to the sewer, as heretofore described, until the air which is compressed in a cushion in the top of compression-tank M will have expanded enough so its power or pressure will have become exhausted or weakened, when the balance or surplus amount of water will return back down the flush-pipe into tubular stem *g* of the valve proper and unite with the balance or surplus amount of water returning from tank-pipe L, which by reason of the pressure of the air compressed by the water in said tank-pipe received from air-chambers *f* and *q* this stream of water, returning the same course it came from both flush-pipe and tank-pipe simultaneously, will pass through port *h* and port *r*, (the latter being more clearly shown in Fig. 3,) down through into waste-pipe K, thence to trap C and the sewer, as already described, and all the pipes and the entire valve will be thoroughly drained of water, thus preventing the freezing and consequent bursting of the pipes,



which so frequently happens, and by the construction herein described and illustrated it will be readily seen that I have, in fact, produced an antifreezing valve.

5 It has been found in practice that one of the important features of my new and novel valve consists in providing an air reservoir or chamber *q*, so as to always have a sufficient quantity of air stored to exert the required  
10 pressure on the water in the pipes, thus permitting of the compression-tank being located above or below the hopper or bowl, as desired, without any danger of the pipes freezing or bursting during the operation of  
15 the closet.

Among some of the many advantages gained by my improved valve when connected to the pipes of a water-closet may be mentioned the following, to wit: doing away with a hopper-  
20 valve. It also does away with all rattling chains or other pulls for operating the tank. It dispenses with Fuller valves, which are objectionable for the reason that they rattle, swell, and consequently close the water-open-  
25 ings and render the closet inoperative and are never as durable as leather packing. My valve always works and gives the same effective flush with no waste of water except during the flushing operation.

30 I wish it to be here understood that while I have illustrated and described what I consider the preferable form of carrying out my invention, I do not wish to limit myself to the exact and precise form of construction or arrangement of the several parts, as they may be some-  
35 what modified, changed and altered, as might suggest itself to any competent mechanic, without departing from the spirit or principles of my invention; as, for example, in-  
40 stead of three different tubular stems being employed one stem properly arranged and divided into three separate apartments might be used, or instead of the power for operating the closet-seat being in the form of a weight  
45 said weight may be removed and the end of the rod attached direct to the lever and a spring be properly inserted in the cap and attached to the stem of supplemental valve.

What I claim as my invention is—

50 1. In a device of the character described, the combination with means for receiving water from the source of supply; of a bell-shaped valve constructed to form a chamber or reservoir for receiving and retaining air and wa-  
55 ter; a supply-valve carried by said bell-shaped valve; an annular tubular stem communicating with the flush-pipe and hopper or bowl when said supply-valve is closed, said stem being normally open to the outer air; and  
60 mechanism actuated by the closet-seat for moving said supply-valve to a closed position until the air and water in said valve-chamber

have passed into the flush-pipe and flushed the bowl.

2. In a device of the character and adapted 65 for the purposes herein set forth; the combination of a valve, having a tubular stem in direct communication with the supply-pipe; of a valve, seated on and over the mouth or  
70 top of said tubular stem, of a chamber or reservoir for storing air and water forming a part of said valve; of a tubular stem for distributing said air and water to the tank-pipe and compression-tank, when said valve is  
75 raised or elevated, the upper end of said stem being below the plane of the upper end of the supply-pipe; of a tubular stem communicating with the flush-pipe and hopper or bowl; and means for opening communication be-  
80 tween said tubular stems and said tank-pipe, with said flush-pipe and said hopper or bowl, when said valve is depressed or lowered, so as to thoroughly flush and cleanse said hopper or bowl; of a waste-outlet for thoroughly  
85 draining and carrying off all water from said valve and pipes, after said hopper or bowl has been flushed; of suitable mechanism for raising and lowering said valve; all substantially as described.

3. In a valve adapted for the purposes as 90 herein set forth; the combination of an inner tubular stem in communication with the water-supply means; of a valve having a supply-valve seated on and over the mouth of  
95 said inner tubular stem, so as to open or close said mouth, when said valve is raised or lowered, thus permitting of the flow of water as desired; a chamber or reservoir for storing air and water, and forming a part of said  
100 valve; of means for permitting of the flow of said air and water to the tank-pipe and compression-tank, when said valve is raised or elevated; of a tubular stem in direct communication with the tank-pipe, the upper end of  
105 said stem being below the plane of the upper end of the supply-pipe, of a tubular stem in direct communication with the flush-pipe; of means for opening up communication through said two last-referred-to tubular stems, be-  
110 tween said tank-pipe and compression-tank, and said flush-pipe and hopper; so as to thoroughly flush and cleanse said hopper or bowl; of ports adapted to permit of the surplus water as it returns to the valve, to pass out of  
115 said valve and pipes and off through the waste; of suitable mechanism for raising and lowering said valve; all substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

PHILIP HAAS.

Witnesses:

HARRY O. WACHTER,  
PERRY ROEHM.