

No. 649,346.

Patented May 8, 1900.

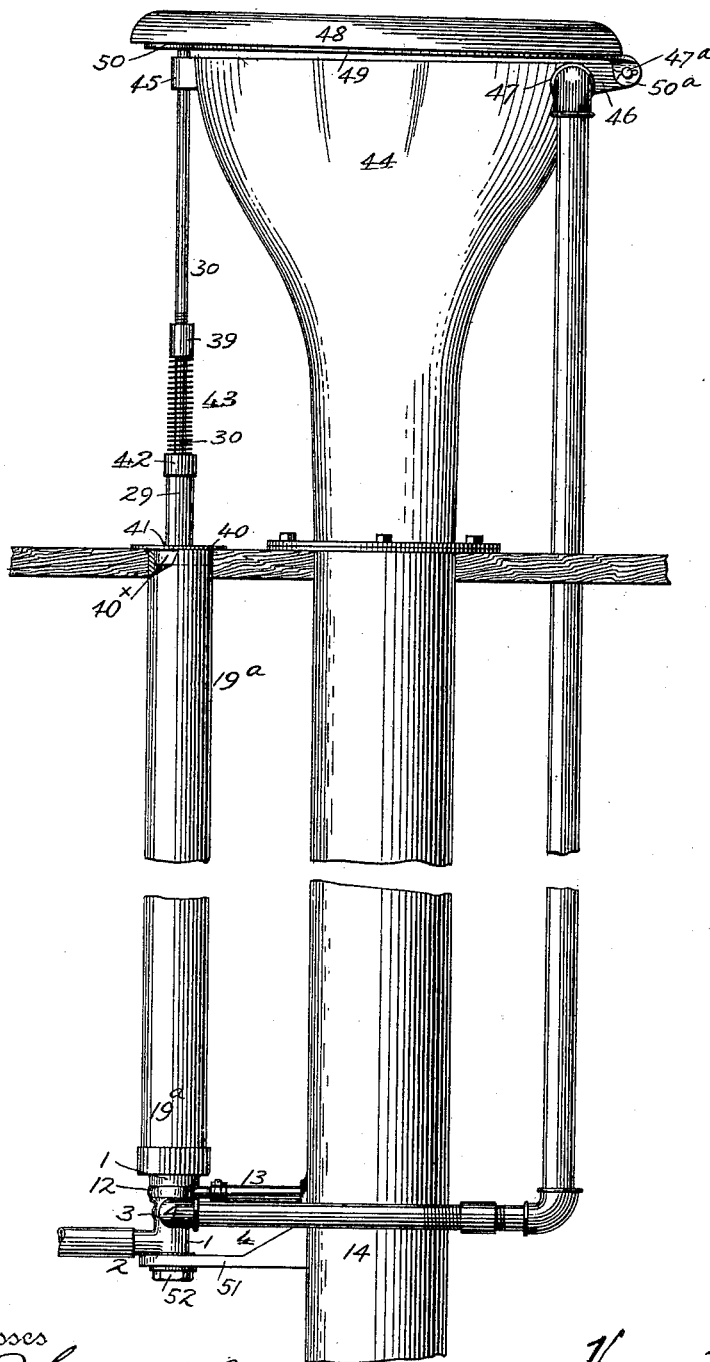
T. F. PAYNE.
VALVE.

(Application filed June 3, 1898. Renewed Oct. 21, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses
Sidney P. Heringworth
Arthur B. Babel

Inventor
Thomas F. Payne
by *Wm. F. Smith*
Attorneys

No. 649,346.

Patented May 8, 1900.

T. F. PAYNE.
VALVE.

(Application filed June 3, 1898. Renewed Oct. 21, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

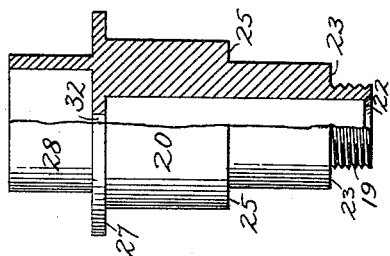


Fig. 5.

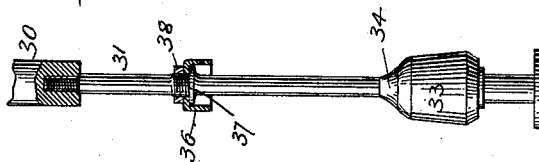


Fig. 3.

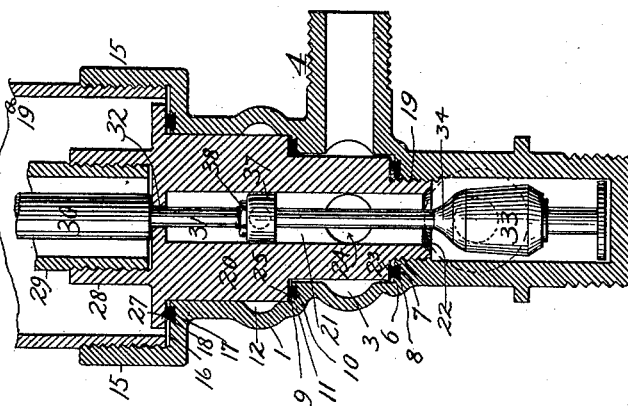
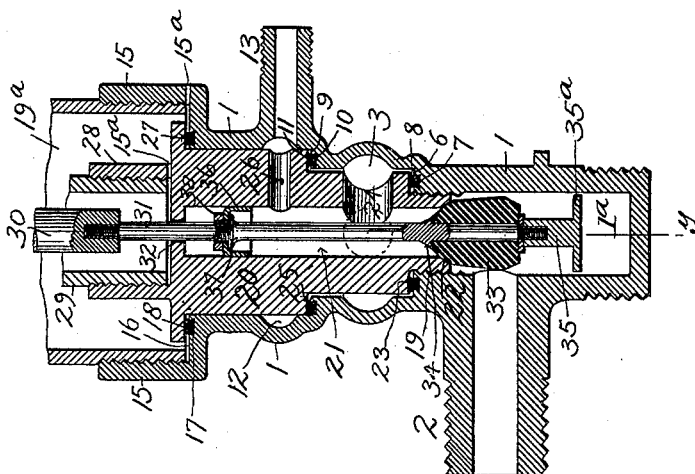


Fig. 2.



Witnesses
Sidney P. Hollingsworth
Arthur B. Seibald

Inventor
Thomas F. Payne
by *W. M. F. Adams*
Attorneys.

UNITED STATES PATENT OFFICE.

THOMAS F. PAYNE, OF SPOKANE, WASHINGTON, ASSIGNOR OF ONE-HALF TO
JOHN A. GRAM, OF PORTLAND, OREGON.

VALVE.

SPECIFICATION forming part of Letters Patent No. 649,346, dated May 8, 1900.

Application filed June 3, 1898. Renewed October 21, 1899. Serial No. 734,406. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. PAYNE, of Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and to the numerals of reference marked thereon.

My invention relates to improvements in valves, and more particularly to such as are used in connection with water-closet systems, although it will be apparent that it is applicable to other systems of water distribution where the results attained by my valve are sought.

One of the objects of my invention is to provide a valve which is, in effect, an anti-freezing-valve, or one whereby by the arrangement of a suitable chamber and sliding valves when the valve is closed by means of a connection with the seat of the water-closet the water is shut off from entrance to the pipe feeding to the flushing-horn in the hopper or bowl and the water remaining in that pipe between the valve and the hopper is allowed to pass back into the valve and thence through a passage in the chamber into a waste-pipe running into the soil-pipe of the closet. In this way all the water beyond the valve is allowed to escape and none remains in the valve and pipe leading to the flushing-horn to freeze in cold weather.

My invention also relates to improvements in water-closet systems, having particular reference to a simple and efficient connection between the water-closet seat and the supply and escape valve above referred to and to means for operating the valve.

In carrying out my invention it is to be observed that the construction may be greatly varied, and it is not my intention to limit myself to mechanical details, provided such means are employed as to enable the objects of my invention to be carried out.

In the accompanying drawings, Figure 1 is a front elevation of a water-closet system, together with a valve, made in accordance with my invention. Fig. 2 is a vertical cross-section of the valve and casing on an enlarged scale. Fig. 3 is a vertical section on the line

y y, Fig. 2. Fig. 4 is a detail of the valve-cup. Fig. 5 is a detail of the valve-stem.

Referring to the drawings, in which like numerals of reference indicate corresponding parts, 1 indicates the valve-casing, made of a single casting, provided with a hollow extension 1^a at the lower end, the object of which will be explained hereinafter, and also having a water-supply-pipe connection 2 near its lower end and an enlarged annular chamber 3 above the water-supply pipe. This chamber 3 opens into a pipe 4, which conveys the water to the flushing-horn in the hopper when the valve is open. Below the chamber 3 the valve-casing is provided with a seat 6, which has an approximately dovetail-shaped channel or groove 7, in which a leather washer 8 is seated, and immediately above the chamber 3 is a similar seat 9, having a channel or groove 10 and washer 11. Near the upper end of the casing is another enlarged annular chamber 12, communicating with a waste-pipe 13, which opens into the soil-pipe 14. The upper end of the casing is also furnished with an internally-screw-threaded socket 15, at the bottom of which is located a seat 16, similar to 6 and 9, formed with a channel or groove 17, having a washer 18 seated therein. In this socket 15 fits a pipe or tube 19^a, in which is placed the pipe carrying the rod for operating the valve.

Below the chamber 3 the valve-casing is internally screw-threaded, as at 19, for the reception of the lower end of the valve-cup 20, which is also screw-threaded. This valve-cup is made of a single casting and has a passage 21 running nearly its entire length and also at its lower end a valve-seat 22. Above these threads, at the lower end of the valve-cup, is formed an external annular shoulder 23, which rests upon the washer 8 in the seat 5. The valve-cup has near its lower end a port 24, which opens into and registers with the lower annular chamber 3 of the casing, which communicates with the pipe 4, running to the flushing-horn in the hopper, and above this port is formed another external annular shoulder 25, which when the casing and cup are assembled rests upon the washer in the seat 9 and forms a tight joint. Above the shoulder 25 is another port 26, and this port,

which is smaller than passage 21, communicates with the chamber 12, which opens into the waste-pipe 13. Near its upper end the valve-cup has a third external annular shoulder 27, which rests upon the washer 17 in the seat 16 at the bottom of the cup 15 at the upper end of the valve-casing. Above the shoulder 27 the valve-cup is provided with an annular socket 28, and in this socket is secured, by sweat-soldering or otherwise, the lower end of a pipe 29, through which passes the valve-operating rod 30. The lower end of this rod 30 is internally screw-threaded to receive the upper end of the valve-stem 31, which stem passes through an opening 32 in the top of the valve-cup. Near its lower end the valve-stem 31 carries a valve 33, made of leather or rubber and adapted to open and close the lower end of the passage 21 in the valve-cup. This valve 33, the upper end of which is slightly oval to enable it to fit snugly in the valve-seat 22 at the bottom of the valve-cup, abuts against an annular flange 34 on the valve-stem and is held in place by a cap 35, provided with a head or plunger 35^a. This cap 35 screws onto the lower end of the valve-stem 31, thereby clamping the valve 33 in place, and the head or plunger is adapted, with the movement of the valve-stem, to slide in the cup-shaped extension 1^a, into which it loosely fits. The object of this arrangement is to cushion the closing of the valve, the disk acting against the resistance of the water in the extension 1^a and preventing an abrupt closing or hammering of the valve 33, which might occur after the working parts had become worn. Near the upper end the valve-stem carries a cup-shaped leather valve 36, the hollow of which fits over a shoulder 37 on the valve-stem and is held in place by a nut 38, screwing onto the upper end of the valve-stem. The valve 36 is adapted to close the port 26 in the valve-cup when the lower valve 33 is open.

The pipe or tube 19^a, screwed into the socket at the top of the valve-casing, passes up through the floor of the closet and is held in position by a floor-plate 40, having an annular flange 40^x on its under side, around which the upper end of the pipe 19^a fits. The purpose of the tube 19^a is to form a guide for the pipe 29, which carries the rod 30, connecting the valve with the closet-seat. This pipe 29, which is secured in the socket at the top of the valve-cup, passes through an opening 41 in the floor-plate 40 and guides the rod 30, which connects at its lower end with the valve-stem 31, said pipe having a cap 42, against which a spiral spring 43, encircling the rod, abuts. This spring is held to action by an adjusting-nut 39 on the rod 30, by means of which the tension of the spring may be increased or diminished, as may be required to facilitate the proper working of the valve-stem and valves.

44 indicates the hopper of ordinary construction, except that it is provided at its

front with an eye 45 for guiding the upper end of the valve-operating rod 30 and holding the same in place and at its rear with lugs 46, to which the closet-seat is hinged. At its rear it is also provided with a flushing-horn 47. The hopper 44, eye 45, lugs 46, and flushing-horn 47 are integral.

The seat 48 of the water-closet is provided with an annular band 49 on its under side, having an extension 50 at its end adjacent to the top of the valve-operating rod 30 and against which the said rod abuts. The band 49 also has two lugs 50^a at its rear end, by means of which and a bolt 47^a the seat is hinged to the lugs 46 at the rear of and at the top of the hopper.

Extending from the soil-pipe 14 is a shoe 51, through which the lower end of the valve-casing 1 projects, the casing being clamped to the shoe by a nut 52, screwing onto the threaded end of the casing.

The operation of my valve will be readily understood by those skilled in the art to which it appertains. When the closet-seat is pressed down, it forces the rod 30 downward against the action of the spring 43, and with it the connecting valve-stem 31. This operation moves the valve 33 from its seat at the bottom of the valve-cup, and at the same time the cup-valve 36 slides over and closes the port 26, opening into the waste-pipe. The water then passes from the supply-pipe 2 into the passage 21 in the valve-cup, thence into the chamber 3, and through the pipe 4 to the flushing-horn and into the hopper. The washer 18 prevents the water which passes from the valve-cup into the chamber of the casing from leaking into the upper part of the casing, and the washer 18 keeps the water from leaking past the coarse threads at the lower end of the valve-cup. The supply of water is continuous so long as the pressure on the closet-seat remains. Upon the pressure being removed from the seat the spring 43 forces up the rod 30 and with it the connecting valve-stem 31, the valve 33 thereupon seating itself in the lower end of the valve-cup and shutting off the supply of water. At the same time the valve 36 slides away from over the waste-pipe port 26 and allows the water remaining in the pipe, which feeds to the flushing-pipe, to pass back into the chamber 3, into the passage 21 in the valve-cup, through the port 26 into chamber 12, and thence through the waste-pipe 13 into the soil-pipe. The washer 18 prevents the water flowing into the valve from leaking between the seat 16 and the shoulder 27 and out through the top of the valve-casing, though if any water by any possibility should escape at this joint it will drain off at the holes 15^a in the sockets 15 and 28.

When it is desired to reach the valve for repairs or other purposes, a wrench can be applied to the upper end of the pipe 29, thereby disconnecting the valve-cup 20, carried at its lower end, from the valve-casing, and the pipe

and valve-cup can be pulled out. The valve-stem, with its valves, can then be removed from the valve-cup for repairing or cleaning.

5 The object of the floor-plate 40 is to prevent any dirt from getting down between the tube 19^a and pipe 29, which would interfere with the removal of the pipe, rod, and valve-cup.

10 From the above it will be seen that I have provided a valve and closet system both simple and effective which can be taken apart for repairs without taking up the floor of the closet and which is so constructed as to prevent freezing in cold weather. The action of
15 the valve being positive, no hammering or rattling will occur when the valve is operated.

Having described my invention, I claim—
1. In a valve, the combination of a casing provided with a hollow extension, and a socket
20 at its upper end, a valve-cup having a socket at its upper end, a supply-port and a waste-port in the said valve-cup, a valve-stem having a plunger adapted to slide in the hollow extension of the casing, and valves for opening and closing the supply and waste ports,
25 a tube seated in the socket of the valve-casing, a pipe seated in the socket of the valve-cup and a rod for operating the valves passing through the said pipe, substantially as set
30 forth.

2. In a water-closet system, the combination of a valve-casing formed with a socket at its upper end, a tube seated in said socket

a plate in the floor of the closet to hold the said tube in place, a valve-cup in the said casing provided with ports communicating
35 with pipes leading to the flushing-pipe and the waste-pipe, valves for alternately opening and closing the open end of the valve-cup and the waste-port, a pipe secured in a socket in
40 the top of the valve-cup and a rod connected to the valve-stem in the valve-cup and adapted to operate the same by pressure from the closet-seat, substantially as set forth.

3. In a water-closet valve, the combination
45 of a valve-casing, a valve-cup therein, a supply-port and a waste-port in the said valve-cup, valves for alternately opening and closing the passage in the valve-cup and the waste-port, the upper end of the casing being provided
50 with a socket, a tube seated in said socket a plate in the floor of the closet for holding in place the said tube, a pipe passing through the said tube and secured to the valve-cup, a rod operated by the closet-seat, passing
55 through the said pipe, for operating the valves in the valve-cup, and a spring for raising the valve-rod when pressure is removed, substantially as set forth.

In testimony whereof I have hereunto set
60 my hand and seal this 18th day of April, 1898.

THOS. F. PAYNE. [L. S.]

Witnesses:

JOHN STUNOET,
CHAS. S. GIFFORD.