

F. N. WHITESELL.
VALVE.

APPLICATION FILED SEPT. 21, 1908.

942,122.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

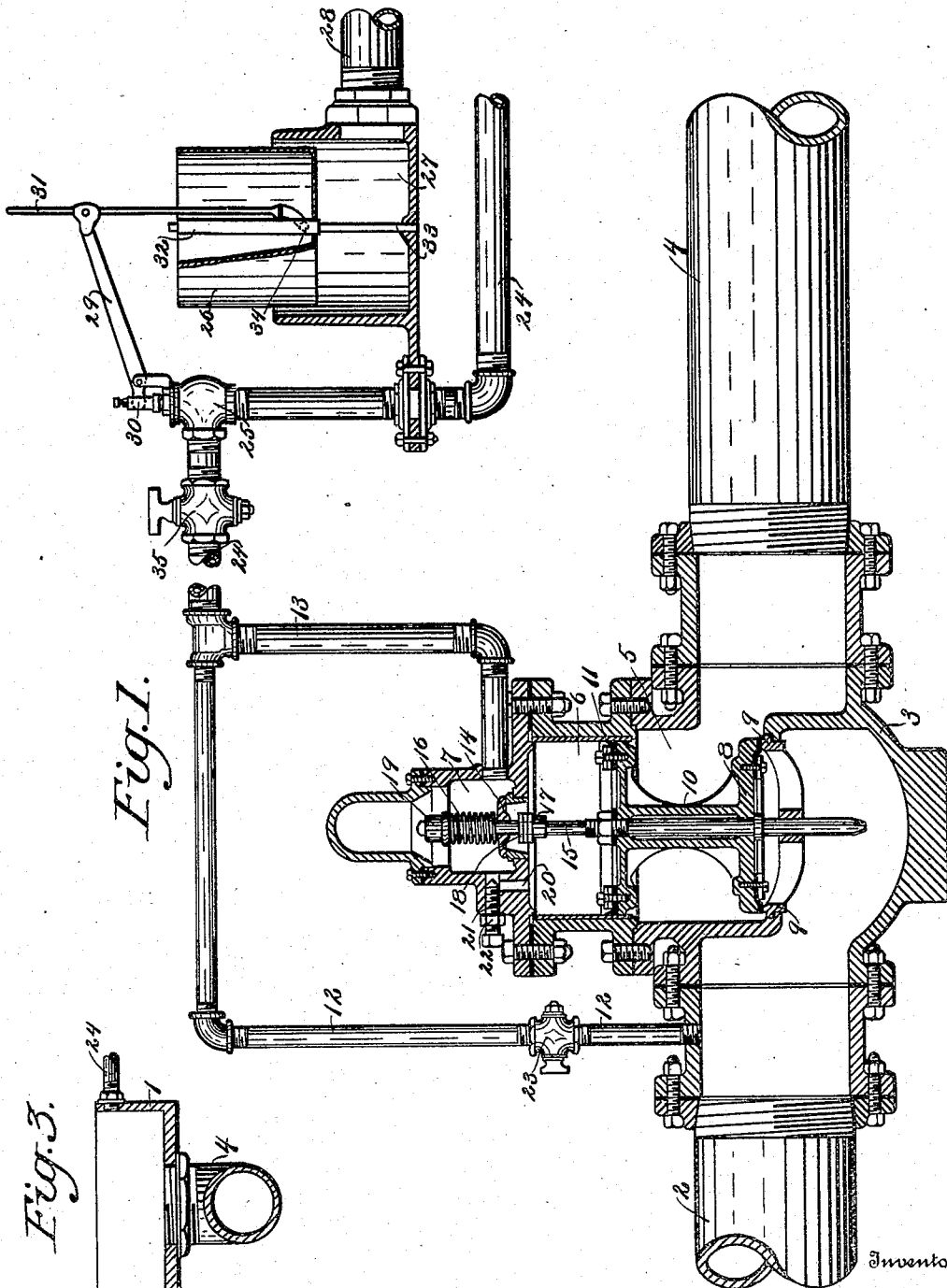


Fig. 1.

Fig. 3.

Witnesses

Gertude Tallman
Oliver Woodruff.

Inventor

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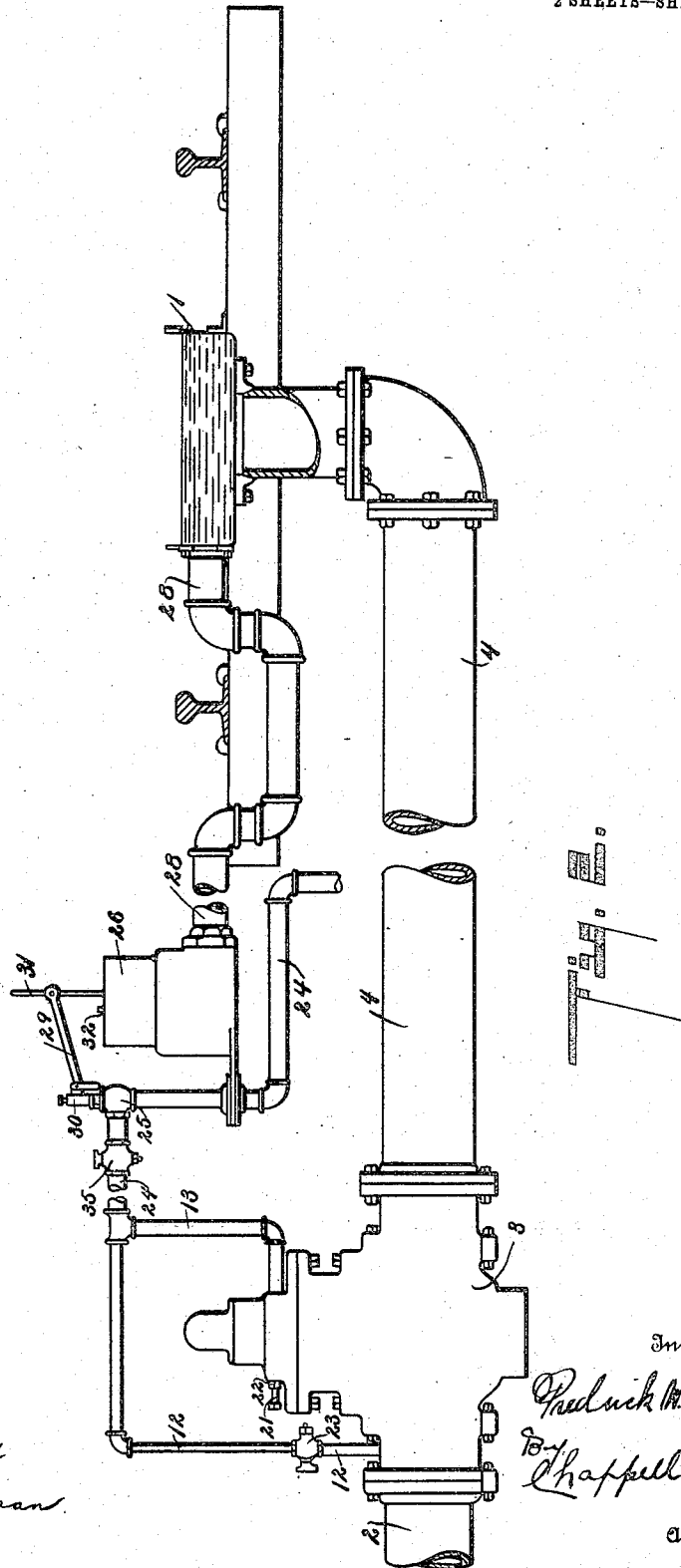
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDRICK N. WHITESELL, OF THREE RIVERS, MICHIGAN, ASSIGNOR TO SHEFFIELD CAR COMPANY, OF THREE RIVERS, MICHIGAN.

VALVE.

942,122.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed September 21, 1908. Serial No. 454,085.

To all whom it may concern:

Be it known that I, FREDRICK N. WHITESELL, a citizen of the United States, residing at Three Rivers, Michigan, have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relates to improvements in valve mechanisms.

My improved valve mechanism is particularly designed by me as an automatic valve for filling tanks, such as track tanks of railways, although certain features thereof are adapted and very desirable for use in various other relations.

The main objects of this invention are: First, to provide an improved valve which will automatically feed the water to a tank, such as a track tank. Second, to provide an improved valve by which water may be delivered under pressure and "water hammer" is effectually prevented. Third, to provide an improved valve which may be adjusted according to the water pressure under which it operates. Fourth, to provide an improved valve which is simple in structure and one which is not likely to get out of repair, and is entirely automatic in its operation. Fifth, to provide an improved valve mechanism which is simple and economical in structure, and, at the same time, very durable and very effective for the purpose intended.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a partial vertical section of a structure embodying the features of my invention. Fig. 2 is a detail elevation of a structure embodying the features of my invention, showing the general relation of the several parts in use, parts being broken away. Fig. 3 is a transverse section through the tank, showing the connections thereof.

Referring to the drawing, 1 represents the tank to be filled, the tank illustrated being

an end view of a track tank from which passing locomotives scoop the water. The water supply pipe 2 may be connected to the water mains, or to a supply tank, as convenient. The valve casing 3 is interposed between the supply pipe 2 and the delivery pipe 4, which is connected at a suitable point to the tank 1. The valve casing 3 is provided with a main valve chamber 5, a piston cylinder 6 and an auxiliary or inlet chamber 7 for the piston cylinder. This valve casing is preferably made up of parts for convenience in manufacture, but, as these structural details of the valve casing and the connection thereto form no part of this invention, they are not described herein, as they will be readily understood by a person skilled in this art from an inspection of the drawing.

The main valve 8 is arranged to close downwardly upon its seat 9, the valve being connected by the yoke 10 to the piston 11. The area of the piston 11 is greater than that of the valve, so that, when the water pressure is equalized in the piston cylinder 6 and the water supply 2, against which pressure the valve must close, the valve will be closed by the piston.

The cylinder 6 is connected to the water supply through the pipes 12, 13 and the inlet or auxiliary valve chamber 7. The inlet or auxiliary valve 14 is mounted upon the stem 15 of the piston and main valve so as to have a slight movement thereon independently of the piston, and main valve, the valve being loosely mounted on the stem between the spring 16 and the collar 17, or rather between the springs and the washers 18, arranged above the collar. These washers are provided for regulating the movement of the valve independently of the piston. It is obvious that the same result could be secured by making the collar 17 adjustable. The washers are provided as a convenient means of accomplishing the result, as, by removing the port cap of the valve casing 3, the adjustment can be effected without otherwise disassembling the structure. The tension of the spring 18 is adjusted by the nut 19 on the valve stem. By thus mounting the auxiliary valve, it is permitted to close before the closing of the main valve. The auxiliary valve chamber 7 is connected by the by-pass passage 20 to the piston cylinder 6, so that, after the auxiliary valve 14 is closed, the water is slowly

supplied to the piston, thus permitting the slow seating of the main valve. This passage is controlled by the needle valve 21, thereby timing the seating of the valve and effectually preventing "water hammer." A lock nut 22 is preferably provided for holding the valve 21 in its adjusted position. The connection for the cylinder to the water supply is preferably provided with a valve 23 which may be adjusted to regulate the passage of the water therethrough, or to cut off the water entirely, should occasion require.

The piston cylinder is provided with a discharge or exhaust pipe 24, which is preferably connected thereto through the pipe 13, as a matter of convenience. The pipe 24 is preferably connected to deliver to the tank 1, thereby saving the exhaust water, although, of course, it might be connected to a drain or sewer, as preferred, or as the location of the parts made it more desirable. The exhaust or discharge pipe 24 is controlled by the valve 25, which is preferably controlled by a float 26 arranged in the float tank 27, which is connected by the pipe 28 to the tank 1, so as to maintain the equilibrium of water level in the float tank and the main tank. The float is connected by the pivoted lever 29 to the valve stem 30, the lever 29 being connected by the link 31 to the float. The float is provided with a central sleeve 32 adapted to reciprocate on the guide rod 33, the link 31 being pivoted at 34 upon the sleeve. Through this connection, as the float rises or falls, the valve 25 is opened or closed. When opened, the pressure in the piston cylinder is reduced, allowing the main valve to open under the pressure of the water supply. Also, when the tank 1 is filled, the float closes the valve 25, allowing the pressure to again equalize in the water supply and piston cylinder, thus closing the main valve.

As previously described, the main valve seats without any "water hammer," or shock. In closing, the closing movement of the main valve is very rapid until the auxiliary valve 14 seats, when the further closing movement is gradual and controlled by the by-pass.

In practice, the float tank is preferably located as close as convenient to the tank to be filled, the pipe 28 being preferably connected to the tank 1, when the same is a track tank of the class described, at a considerable distance from the pipe 4, so that the incoming water will not act directly thereon, which would cause the exhaust valve to be opened and closed a number of times before the tank was filled to its normal level.

In case it should be necessary to adjust the float or have access to the exhaust valve 25, a valve 35 is provided in the exhaust pipe 24 in front of the float controlled valve 25.

I have illustrated and described my improved valve mechanism in detail in the form preferred by me and I have shown it in relation to a track tank. It will be obvious that it is adapted for controlling the filling of any tank, and the automatic valve proper is desired for use in a great variety of relations, particularly where it is desirable to control the delivery of large streams of water under pressure.

I have illustrated and described my improvements in detail in the form preferred by me on account of the structural simplicity and economy thereof, although I am aware that the same can be very greatly varied in structural details without departing from my invention, and I desire to be understood as claiming the same specifically, as illustrated, as well as broadly.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a main tank, of a water supply; a valve casing connected to said water supply and main tank and provided with a main valve chamber; a piston cylinder, and an auxiliary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a valve for said connection; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve movably mounted on the stem of said piston; means for regulating the movement of said auxiliary valve on said stem relative to said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; a valve for said by-pass; an exhaust pipe for said auxiliary valve chamber; a valve for said exhaust pipe; a float tank connected to said main tank; a float; and connections for said float to said valve for said exhaust pipe.

2. The combination with a main tank, of a water supply; a valve casing connected to said water supply and main tank and provided with a main valve chamber; a piston cylinder; and an auxiliary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve movably mounted on the stem of said piston; means for regulating the movement of said auxiliary valve on said stem relative to said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; a valve for said by-pass; an exhaust pipe for said auxiliary valve chamber; a valve for said exhaust pipe; a float tank connected to said main tank; a float; and connections for said float to said valve for said exhaust pipe.

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connected to said main tank; a float; and connections for said float to said valve for said exhaust pipe.

10. The combination with a main tank, of
5 a water supply; a valve casing connected to said water supply and main tank and provided with a main valve chamber; a piston cylinder; an auxiliary or inlet chamber for said piston cylinder connected to said water
10 supply; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve having a lost motion connection with said piston whereby it may seat before said
15 main valve; a by-pass for said auxiliary valve; an exhaust pipe for said auxiliary valve chamber; a valve for said exhaust pipe; a float tank connected to said main
20 tank; a float; and connections for said float to said valve for said exhaust pipe.

11. The combination with a main tank, of
a water supply; a main valve; a piston connected thereto, the area of said piston being
25 greater than that of said main valve; a connection for said piston to the water supply; an auxiliary valve arranged in said connection to control the delivery of the water to said piston, said auxiliary valve having a
30 lost motion connection with said piston whereby it may seat before the seating of said main valve; a by-pass for said auxiliary valve; a valve for said by-pass; an exhaust
35 for said piston; a valve therefor; a float tank connected to said main tank; a float; and connections for said float to said valve for said exhaust pipe.

12. The combination with a main tank, of
a water supply; a main valve; a piston connected thereto, the area of said piston being
40 greater than that of said main valve; a connection for said piston to the water supply; an auxiliary valve arranged in said connection to control the delivery of the water to said piston, said auxiliary valve
45 having a lost motion connection with said piston whereby it may seat before the seating of said main valve; a by-pass for said auxiliary valve; an exhaust for said piston; a valve therefor; a float tank connected to
50 said main tank; a float; and connections for said float to said valve for said exhaust pipe.

13. The combination with a tank, of a water supply; a main valve; a piston connected thereto; a connection for said piston
55 to the water supply; an auxiliary valve arranged in said connection to control the delivery of water to the piston, said auxiliary valve being provided with a lost motion connection to said piston whereby it is per-
60 mitted to seat before the seating of said main valve; a by-pass for said auxiliary valve; an exhaust for said piston; a valve therefor; and a float arranged to control said valve for said exhaust.

65 14. The combination with a water supply,

of a valve casing provided with a main valve chamber, a piston cylinder, and an auxiliary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber
70 to the water supply; a valve for said connection; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve movably mounted on the stem of said
75 piston; means for regulating the movement of said auxiliary valve on said stem relative to said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; a valve for said by-pass; an ex-
80 haust pipe for said auxiliary valve chamber; and a valve for said exhaust pipe.

15. The combination with a water supply, of a valve casing provided with a main valve chamber; a piston cylinder, and an auxil-
85 iary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a main valve; a piston connected thereto, the area of said piston being greater than that of said main
90 valve; an auxiliary valve movably mounted on the stem of said piston; means for regulating the movement of said auxiliary valve on said stem relative to said piston; a by-
95 pass connecting said auxiliary valve chamber with said cylinder chamber; a valve for said by-pass; an exhaust pipe for said auxiliary valve chamber; and a valve for said exhaust pipe.

16. The combination with a water supply, of a valve casing provided with a main valve
100 chamber; a piston cylinder, and an auxiliary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a valve for said connection; a main valve; a piston con-
105 nected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve movably mounted on the stem of said piston; means for regulating the movement of said auxiliary valve on
110 said stem relative to said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; an exhaust pipe for said auxiliary valve chamber; and a valve for said exhaust pipe.
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17. The combination with a water supply, of a valve casing provided with a main valve chamber; a piston cylinder, and an auxiliary
120 or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a valve for said connection; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an
125 auxiliary valve movably mounted on the stem of said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; a valve for said by-pass; an exhaust pipe for said auxiliary valve cham-
130 ber; and a valve for said exhaust pipe.

18. The combination with a water supply, of a valve casing provided with a main valve chamber; a piston cylinder; and an auxiliary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve movably mounted on the stem of said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; a valve for said by-pass; an exhaust pipe for said auxiliary valve chamber; and a valve for said exhaust pipe.

19. The combination with a water supply, of a valve casing provided with a main valve chamber; a piston cylinder, and an auxiliary or inlet chamber for said piston cylinder; a connection for said auxiliary valve chamber to the water supply; a valve for said connection; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve movably mounted on the stem of said piston; a by-pass connecting said auxiliary valve chamber with said cylinder chamber; an exhaust pipe for said auxiliary chamber; and a valve for said exhaust pipe.

20. The combination with a water supply, of a valve casing provided with a main valve chamber; a piston cylinder; an auxiliary or inlet chamber for said piston cylinder connected to said water supply; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve having a lost motion connection with said piston whereby it may seat before said main valve; a by-pass for said auxiliary valve; a valve for said by-pass; an exhaust pipe for said auxiliary valve chamber; and a valve for said exhaust pipe.

21. The combination with a water supply, of a valve casing provided with a main valve chamber; a piston cylinder; an auxiliary or inlet chamber for said piston cylinder connected to said water supply; a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; an auxiliary valve having a lost motion connection with said piston whereby it may seat before said main valve; a by-pass for said auxiliary valve; an exhaust pipe for said auxiliary valve chamber; and a valve for said exhaust pipe.

22. The combination with a water supply, of a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; connections for said piston to the water supply; an auxiliary valve arranged in said connection to control the delivery of the water to said piston, said auxiliary valve being provided with a lost motion connection to said piston whereby it is permitted to seat before the seating of said main valve; a by-pass for said auxiliary valve; a valve for said by-pass; an exhaust for said piston; and a valve therefor.

23. The combination with a water supply, of a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; connections for said piston to the water supply; an auxiliary valve arranged in said connection to control the delivery of the water to said piston, said auxiliary valve being provided with a lost motion connection to said piston whereby it is permitted to seat before the seating of said main valve; a by-pass for said auxiliary valve; an exhaust for said piston; and a valve therefor.

24. The combination with a water supply, of a main valve; a piston connected thereto, the area of said piston being greater than that of said main valve; connections for said piston to the water supply; an auxiliary valve arranged in said connection to control the delivery of the water to said piston, said auxiliary valve being provided with a lost motion connection to said piston whereby it is permitted to seat before the seating of said main valve; a by-pass for said auxiliary valve; and means for regulating the seating of said auxiliary valve relative to said main valve.

25. The combination with a water supply, of a main valve; a piston connected thereto; connections for said piston to said water supply; an auxiliary valve arranged in said connection to control the delivery of water to said piston; and a lost motion connection between said auxiliary valve and piston whereby said auxiliary valve is permitted to seat before the seating of said main valve.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

FREDRICK N. WHITESELL. [L. S.]

Witnesses:

FRED C. B. SCHOOMAKER,
FRED E. BUERGIN.