

R. W. PRESTON.  
 AUTOMATIC VALVE CONTROLLING MEANS.  
 APPLICATION FILED JUNE 24, 1912.

1,062,553.

Patented May 20, 1913.

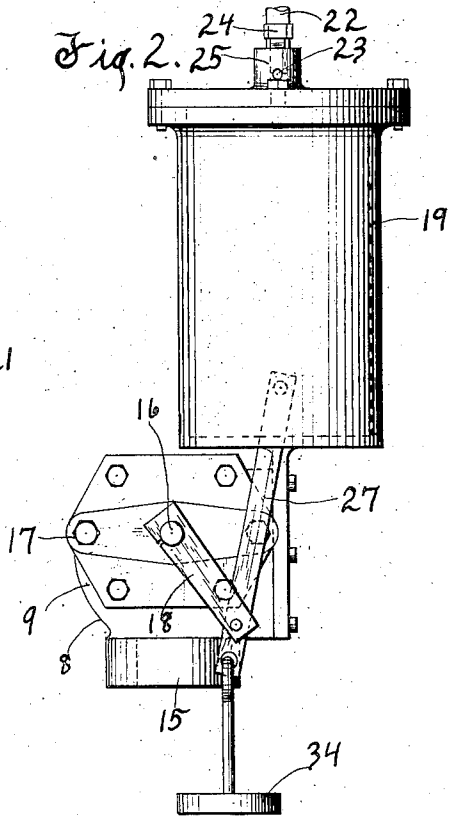
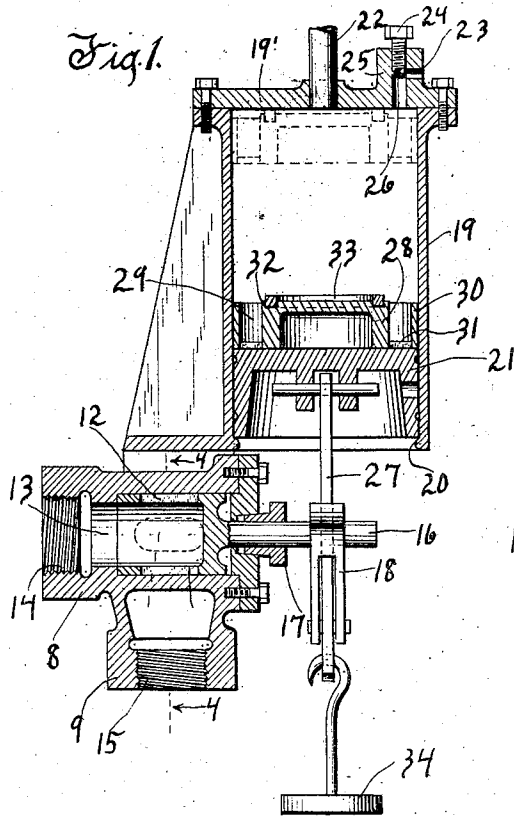


Fig. 3.

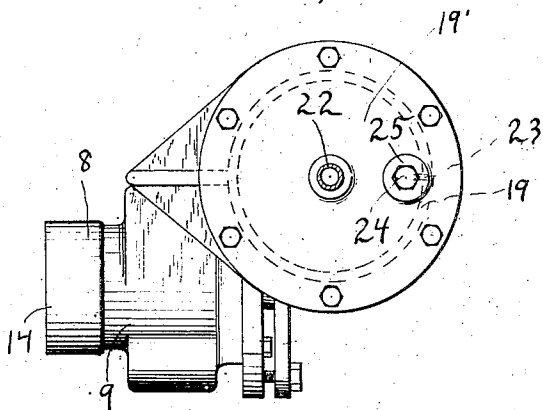
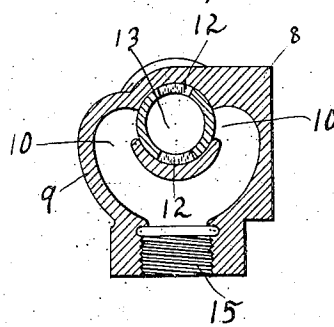


Fig. 4.



INVENTOR.

WITNESSES.

Arthur F. Miller

Katherine Holt

Ray W. Preston,  
 By Morrell & Caldwell  
 ATTORNEYS

# UNITED STATES PATENT OFFICE.

RAY W. PRESTON, OF CONNERSVILLE, INDIANA, ASSIGNOR TO UNITED VACUUM APPLIANCE COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## AUTOMATIC VALVE-CONTROLLING MEANS.

1,062,553.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed June 24, 1912. Serial No. 705,518.

*To all whom it may concern:*

Be it known that I, RAY W. PRESTON, a citizen of the United States; and resident of Connerville, in the county of Fayette and State of Indiana, have invented new and useful Improvements in Automatic Valve-Controlling Means, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in automatic valve controlling means.

It is one of the objects of this invention to provide an automatic valve controlling means which is adapted to be actuated by vacuum means and to be used in connection with vacuum operated valves for air, steam, gas or liquid, in vacuum heating systems or vacuum controlled electrical switches or rheostats.

A further object of the invention is to provide an automatic valve controlling means which is particularly adapted for use in connection with vacuum cleaning systems for controlling the intermittent supply of water to the dust receiving tank.

A further object of the invention is to provide an automatic valve controlling means which is adapted to permit the flow through a valve connected thereto of a predetermined amount of water directly from the water pressure pipe.

A further object of the invention is to provide an automatic valve controlling means which is adapted to control the opening or closing of a valve by vacuum means and to reverse the movement of the valve a predetermined period of time after the valve has been so moved.

With the above and other objects in view, the invention consists of the improved automatic valve controlling means and its parts and combinations, as set forth in the claims, and all equivalents thereof.

Referring to the drawing in which the same reference characters indicate the same parts in all of the views: Figure 1 is a vertical sectional view of the automatic valve controlling means shown attached to the water inlet valve of a vacuum cleaning system; Fig. 2 is a side view thereof taken at right angles to Fig. 1; Fig. 3 is a top view thereof; and Fig. 4 is a vertical sectional view, taken on line 4—4 of Fig. 1, of a valve

adapted to be used in connection with the controlling means.

Referring to the drawing the numeral 8 indicates one of the valves adapted to be used in connection with the controlling means. The valve is of the rotatable type and the casing 9 is provided with ports 10 on opposite sides of the plug 11 to equalize or balance the pressure, and the plug is of tubular open end construction with opposite ports 12 which admit the water to the bore 13 of the plug and from which bore it passes out through the discharge end 14 of the valve casing. The inlet opening 15 is adapted to be connected to a source of water under pressure supply and the outlet opening 14 is connected to the dust receiving tank (not shown) of a vacuum cleaning system. The stem 16 of the plug extends through a stuffing box 17 of the casing and is provided with a valve arm 18 on its outer end.

The valve controlling means is mounted on the valve and comprises a vacuum cylinder 19 having its upper end closed by a head 19' and with its lower end open. The lower edge portion of the cylinder is provided with an annular inwardly extending flange 20 which serves as a stop to prevent the piston 21 from dropping out of the cylinder when in its lowermost position. The head 19 of the cylinder has extending therefrom a pipe 22 which leads to and connects with a vacuum pump (not shown) and which is adapted to exhaust the air from the cylinder. The head is also provided with a leakage opening 23 which is controlled by a screw bolt 24 threaded into an upstanding boss 25 formed on the cylinder head. The leakage opening extends at right angles to and communicates with the bolt opening 26 so that when the bolt is screwed into the boss it will close the leakage opening.

The piston 21 has depending therefrom a connecting rod 27 which at its lower end is connected to the outer end of the valve lever 18. An auxiliary piston 28, resting on top of the main piston 21 is provided with an annular opening or port 29 extending vertically through the piston and the outer ring 30 formed by the opening is connected to the medial portion of the piston by ribs 31. The upper face of the auxiliary piston is provided with an annular groove 32 to accommodate an annular rubber gasket 33

which is adapted to close the open end of the vacuum pipe 22 when the auxiliary piston 28 is moved to the upper end of the cylinder.

- 5 The lower end of the connecting rod 27 is provided with a weight 34 which assists in pulling the main piston downwardly when released from the suction of the vacuum pipe. Other weights (not shown) 10 may be connected to the weight 34 to provide for further adjusting the rapidity of travel of the main piston.

In the operation of the controlling means in connection with a vacuum cleaning apparatus the main piston of the controlling means is attached to the valve controlling the flow of water to the dust receiving chamber and the vacuum pipe is connected to the exhaust pump of the apparatus. When the 20 air is exhausted from the vacuum cylinder the atmospheric pressure will force the main piston and the auxiliary piston resting thereon to the upper portion of the cylinder, and in moving upwardly the plug of the 25 water valve will be turned to open position and the dust receiving chamber of the apparatus will receive its charge of water. When the auxiliary piston reaches the cylinder head the rubber gasket will contact 30 with the surface thereof and seal the opening to the vacuum pipe, and as air will slowly enter the vacuum chamber through the leakage opening, the main piston will drop by gravity and close the water valve. 35 The auxiliary piston will be held in its uppermost position by the atmospheric pressure as long as a vacuum is maintained in the vacuum pipe, but as soon as the vacuum is reduced by stopping the pump, or by other 40 means, the auxiliary piston will drop to its initial position by gravity and the controlling means is automatically in position for another cycle of operation.

From the foregoing description it will be 45 seen that the automatic valve controlling means is adapted for use in connection with vacuum cleaning apparatus and many other systems using vacuum tension.

What I claim as my invention is:

- 50 1. An automatic controlling means, comprising a vacuum cylinder, a main member positioned within the cylinder and movable therein by atmospheric pressure, and an auxiliary member positioned within the cylinder and movable in one direction by the 55 main member and independently movable in the opposite direction.

2. An automatic controlling means, comprising a vacuum cylinder, a main piston 60 positioned within the cylinder and movable therein by atmospheric pressure, and an aux-

iliary piston positioned within the cylinder and movable in one direction by the main member and independently movable in the opposite direction, said auxiliary piston 65 adapted to be held in a position of rest by atmospheric pressure.

3. An automatic controlling means, comprising a vacuum cylinder provided with an outlet opening and an inlet opening, a main 70 piston within the cylinder and movable therein in one direction by atmospheric pressure, and an auxiliary piston positioned within the cylinder and movable in one direction by the main piston to a position to 75 seal the outlet opening of the cylinder.

4. An automatic controlling means, comprising a vacuum cylinder provided with an opening through which the air is exhausted from the cylinder and also provided with 80 an air inlet opening, means for adjusting the size of said inlet opening, a main piston within the cylinder and movable therein in one direction by atmospheric pressure, and an auxiliary piston positioned within the 85 cylinder and movable in one direction by the main piston to seal the outlet opening of the cylinder, said auxiliary piston adapted to be held in its sealing position while the main piston is dropping to its normal position of 90 rest.

5. An automatic controlling means, comprising a vacuum cylinder provided with an opening through which the air is exhausted from the cylinder and also provided with an 95 air inlet opening, means for adjusting the size of said inlet opening, a main piston within the cylinder and movable therein in one direction by atmospheric pressure, a connecting member depending from said piston, 100 an auxiliary piston positioned within the cylinder and movable in one direction by the main piston to a position to seal the exhaust opening of the cylinder, and a sealing member carried by the auxiliary piston, 105 said auxiliary piston adapted to be held in its sealing position while the main piston is dropping to its normal position of rest.

6. An automatic controlling means, comprising a cylinder, a main member positioned 110 within the cylinder and movable therein, and an auxiliary member positioned within the cylinder and movable in one direction by the main member and independently movable in the opposite direction. 115

In testimony whereof, I affix my signature, in presence of two witnesses.

RAY W. PRESTON.

Witnesses:

D. W. McKee,  
HYATT L. FROST.