

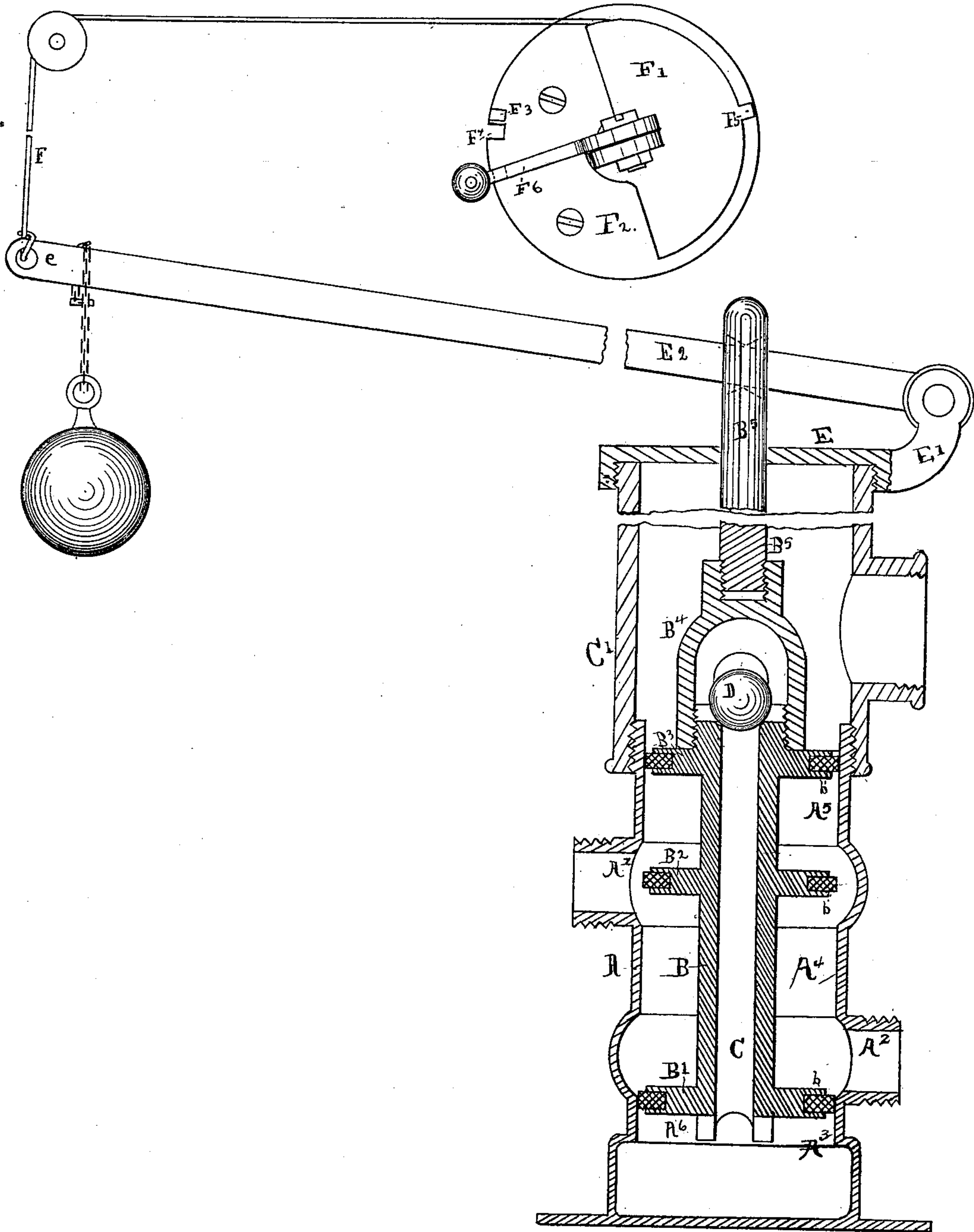
(No Model.)

P. HARVEY.

STOP AND WASTE VALVE.

No. 329,736.

Patented Nov. 3, 1885.



Witnesses:

Francis W. Parker.

L. B. Riggs

Inventor:

Patrick Harvey  
by Chas. S. Burton  
his Atty.



# UNITED STATES PATENT OFFICE.

PATRICK HARVEY, OF CHICAGO, ILLINOIS.

## STOP AND WASTE VALVE.

SPECIFICATION forming part of Letters Patent No. 329,736, dated November 3, 1885.

Application filed December 1, 1884. Serial No. 149,243. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK HARVEY, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stop and Waste Valves, of which the following is a full and complete description.

The purposes of this invention are to provide as a stop and waste valve a balanced valve which shall therefore require to actuate it in either direction only sufficient force to overcome the friction and inertia of its parts, to provide, in connection with such stop and waste valve, an automatic check against the return of gas and sewage, such check to be connected and made as a part of such stop and waste valve, and the whole so arranged that all the valves, including the check, may be withdrawn from above for repairs, &c., without digging up the shell or in any way disturbing its connections.

It consists, as means for the accomplishment of these purposes, of a cylindrical shell having lateral induction and eduction ports, a piston-rod playing longitudinally through the cylinder, having two or three equal valves or pistons rigid with it, one of which closes a waste-port in the cylinder, said piston-stem having the waste-duct through it, and provided with a suitable check-valve closing inward.

The drawing is a vertical section of my invention in a preferred form.

A is the shell, having the induction-port A', the eduction-port A'', the cylindrical seats A<sup>3</sup>, A<sup>4</sup>, and A<sup>5</sup>.

B is the piston-rod, having, as shown, three piston-heads, B', B<sup>2</sup>, and B<sup>3</sup>, though the heads B<sup>2</sup> and B<sup>3</sup> may be considered as constituting but one, whose length is the entire distance from their opposite edges. I prefer the form shown, for the convenience thereby afforded in inserting the rubber rings b, which serve as packing. The piston-rod B has the central longitudinal duct, C, which extends from the lower end of said piston-rod to the cage B<sup>4</sup>, and which serves as a waste-passage, as hereinafter explained.

D is a check-valve closing the upper end of the duct C. It is retained in proximity to its

seat by the cage B<sup>4</sup>, to the upper end of which the rod B<sup>5</sup> is attached, which extends thence up to any point convenient for actuating it by connection with a lever, as hereinafter explained. The rod B<sup>5</sup> is inclosed to the surface of the ground by the pipe C', screwed onto the upper end of the shell A, outside the cage B<sup>4</sup>. It is preferably inclosed at the upper end by the cap E, which is pierced for the rod B<sup>5</sup>, and is preferably provided with the ear E', in which is the fulcrum of the lever E<sup>2</sup>, which passes through a slot in the rod B<sup>5</sup>, and is provided on its free arm E with a weight adjustable and sufficient to overcome the friction of the valves and cause the piston to drop when not sustained, as provided by the cord F, which extends from the free end of the lever E<sup>2</sup> to any convenient point, where is fixed the half-sheave F' on the plate F<sup>2</sup>, which has the stop F<sup>3</sup> and the notch F<sup>4</sup> co-operating, respectively, with the tooth F<sup>5</sup> and the latch F<sup>6</sup> on the sheave, the stop-tooth limiting the motion of the cord, and so of the lever when it descends, and the latch by engaging in the notch keeping the cord wound up and the lever raised when the valve is desired to be kept open. The distances between and the lengths of the several valves with relation to the lengths of and distances between their respective seats are such that when the piston-rod is at its lowest point the valve B' is below its seat A<sup>3</sup>. The valves B<sup>2</sup> and B<sup>3</sup> together act as one valve in effect and close the induction-port A', the pressure upon the valves, both from the supply and from the service pipes, being balanced. In this position there is free communication from the service-pipes through the eduction-port A'', the waste-port A<sup>6</sup>, and the waste-duct C. When the piston-rod is raised, the valve B' reaches and covers its seat, closing the waste-port A<sup>6</sup> before the valve B<sup>2</sup> is off its seat A<sup>4</sup>. In this position both the induction and eduction ports are closed against any communication between them, or between either of them and the waste-port, and the pressure of both the supply and service water is balanced upon the piston-stem. As the piston is further raised the eduction-port is uncovered by the piston B<sup>2</sup> and communication is established between the induction and eduction ports, the waste-port remaining closed by the valve B',



which thus is never raised above the upper edge of its cylindrical seat A<sup>3</sup>, except when being removed for repairs. In this position, also, the pressure is balanced and the piston has no tendency to move except as caused by its weight, or the weight of its connections. It will be seen that at no time can there be direct communication between the induction-port and the supply-pipe and the waste port and pipe. The check-valve will be seated by any back-pressure or flow of gas or water, and so will prevent sewage or gas reaching the service-pipes when the waste is open and the supply closed. It will be seen that the location of the waste-duct through the stem and the location therein of the check-valve D renders possible the removal of all the valves at once by withdrawing the piston from above, which can be done by removing the cap, while the general structure offers the advantage of permitting such removal from above without disturbing the shell or any of its connections, which are usually under ground. The balanced character of the valve renders the use of a weight unnecessary whenever the situation will permit the use of a rigid rod, instead of a cord, to connect the lever E<sup>2</sup> to the point at which it is to be operated.

It will be observed, as an element of the construction of both forms, that the valve or piston B<sup>3</sup> is never off its seat A<sup>5</sup>, but in all positions of the valve-stem remains as a partition, cutting off communication, outside of the valve-stem, from the induction or eduction ports to the waste-port, and that the duct C, penetrating the transverse plane of said piston B<sup>3</sup>, is thus made the only avenue of communication from the waste-port on one side of that plane to the eduction-port on the other side; and however much the arrangement of the several valves, ports, and seats may be varied to accomplish subordinate results, this feature must be retained in order to force the waste to pass in some part of its course through the stem, so that it may be possible to locate in the stem the mechanism to control either the outflow or back-current of waste or sewage or gas.

Certain specific modifications of this invention are shown and described in my pending applications, No. 153,964 and No. 153,965, filed January 26, 1885, and I do not herein claim those forms specifically, though they are included in the generic invention herein claimed.

I claim—

1. In a stop and waste valve, the valve-stem having the waste-duct located therein, in combination with an automatic check-valve seating inward to close said duct in the stem and opening in the direction of the waste-outflow through said duct, substantially as set forth.

2. In a stop and waste valve, in combination, the valve-shell having induction, eduction, and waste ports, and a cylindrical seat between the induction and eduction ports upon one hand and the waste-port upon the other hand, the valve-stem having a valve to close the induction-port, and another to close the waste-port, and a third valve or piston rigid with it and adapted to said cylindrical seat, and a duct within it opening to its surface beyond said last-named valve or piston in the direction of the waste-port, said piston being located to be in contact with said cylindrical seat throughout the entire stroke of the valve-stem, whereby communication between the induction and eduction ports on one hand and the waste-port on the other hand is restricted to the said duct in the stem, substantially as set forth.

3. In a stop and waste-valve, in combination, the valve-shell having induction, eduction, and waste-ports, and a cylindrical seat between the induction and eduction ports upon one hand and the waste-port upon the other hand, the valve-stem having a valve to close the induction port and another to close the waste-port, and a third valve or piston rigid with it, adapted to said cylindrical seat, and a duct opening to its surface beyond said piston in the direction of the waste-port, and a check-valve in said duct and adapted to close the same by seating inward, said piston being located to be in contact with its said cylindrical seat throughout the entire stroke of the valve-stem, substantially as and for the purpose set forth.

4. In a stop and waste valve, in combination, substantially as set forth, the valve-shell having the induction, eduction, and waste ports, the valve-seats A<sup>3</sup>, A<sup>4</sup>, and A<sup>5</sup>, of uniform diameter, the valve-stem having the piston valves B<sup>1</sup>, B<sup>2</sup>, and B<sup>3</sup>, of uniform diameter, and the central waste-duct, and the automatic check-valve D, seating inwardly to close said duct, substantially as set forth.

5. The valve-shell A, with its ports and valve-seats, the valve-stem B, with its piston-valves and interior waste-duct, the check-valve D, adapted to close said duct by seating inwardly, and the cage B<sup>4</sup>, retaining said check-valve and forming the connection between the valve-stem and its actuating-rod, substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 21st day of November, A. D. 1884.

PATRICK HARVEY.

Attest:

FRANCIS W. PARKER,  
CHAS. S. BURTON.