C. SELIN.

AUTOMATIC DRAINAGE GOVERNOR.

APPLICATION FILED FEB. 8, 1910.

1,017,178.

Patented Feb. 13, 1912.

2 SHEETS—SHEET 1.

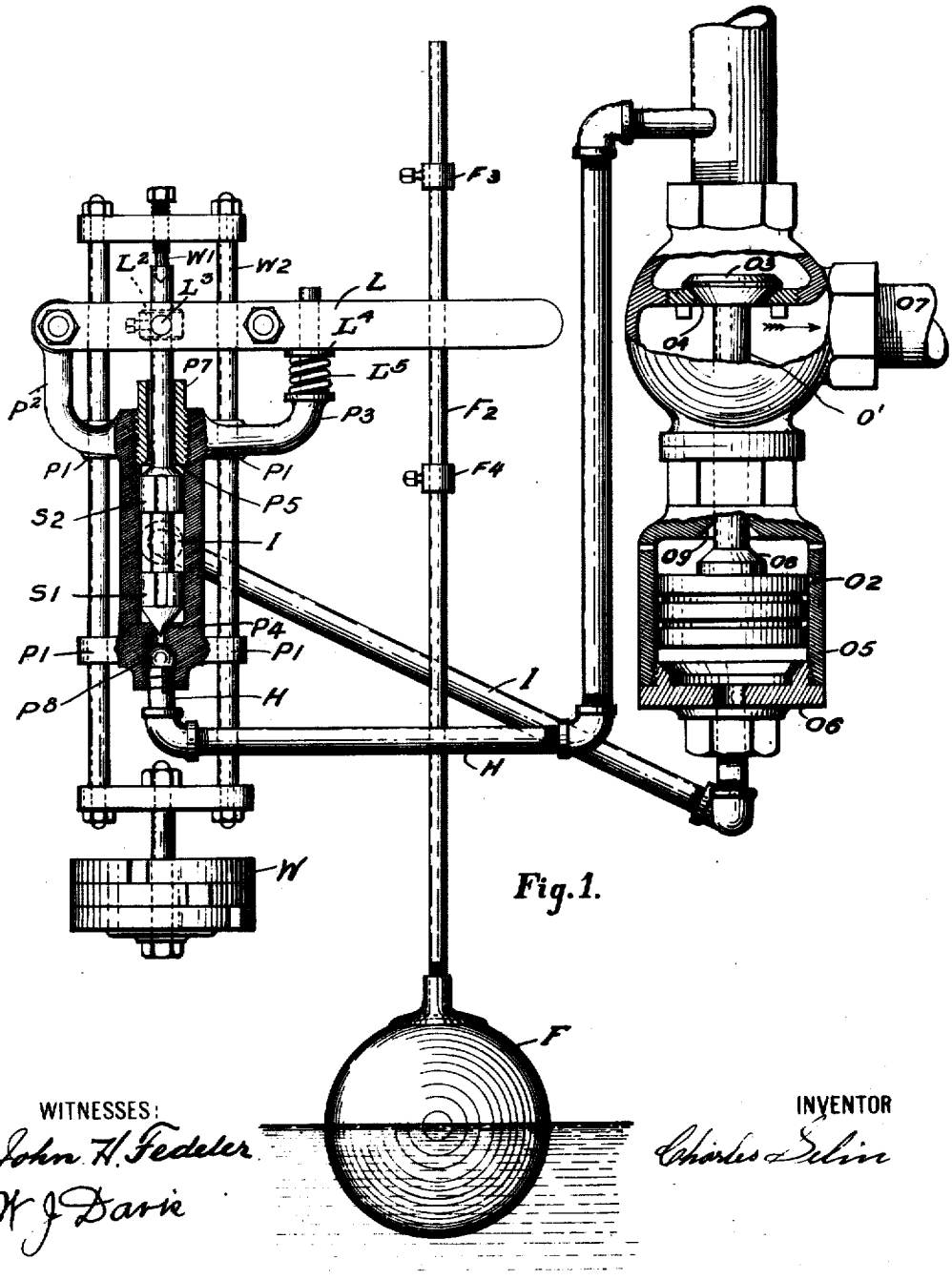

Fig. 1.

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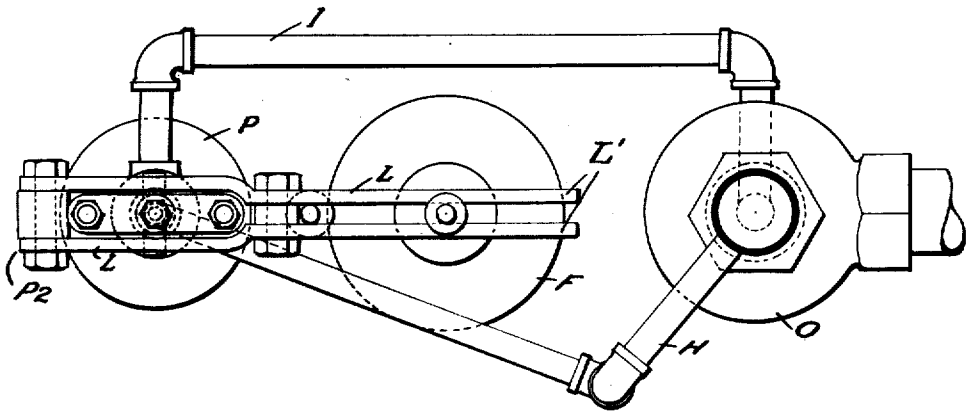

Fig. 2.

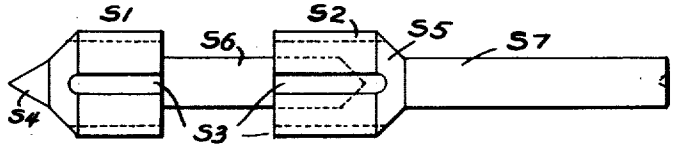

Fig. 3.

Fig. 4.

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AUTOMATIC DRAINAGE-GOVERNOR.

1,017,178. Specification of Letters Patent. Patented Feb. 13, 1912.

Application filed February 8, 1910. Serial No. 542,780.

To all whom it may concern:

Be it known that I, CHARLES SELIN, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improved Automatic Drainage-Governors, of which the following is a specification.

This invention relates to certain new and useful improvements in automatic governors and more particularly to an apparatus which is particularly designed for use in connection with a suction pump or ejector as commonly employed for draining tanks or reservoirs and the invention has for its primary object the provision of means actuated by the operating fluid for the pump or ejector to automatically control the operation of the same.

A further object of the invention resides in the provision of a valve of new and novel construction actuated by means of a float disposed in the tank or reservoir whereby the drainage pump or ejector is caused to operate upon the fluid attaining a predetermined level in the reservoir and the operation of the pump stopped when the fluid has been lowered to a desired level.

Still another object of the invention is to provide an apparatus of the above described character which is comparatively simple in construction, and efficient and positive in its operation.

With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an apparatus embodying my improvements, certain of the parts being shown in section; Fig. 2 is a top plan view thereof; Fig. 3 is a detail view of the float controlled valve member; and Fig. 4 is an end elevation of said valve member.

Referring in detail to the drawings P indicates generally a pilot valve which consists of a cylinder in which a compound valve member is longitudinally movable. This valve member includes the valve heads S^1 and S^2 which are spaced and connected by a stem section S^6. The upper section of the valve stem S^7 is integrally connected to the valve head S^2 and is movable through a sleeve or bushing P^7 which is threaded in the upper end of the bore of the valve cylinder. The stem section S^7 is loosely disposed in the sleeve P^7 so that there is an escape passage for the steam or air around said stem. The lower end of this sleeve is provided with a valve seat P^5 with which the face S^5 of the head S^2 engages. The lower end of the bore of the pilot valve cylinder is also provided with a seat P^4 with which the valve head S^1 co-acts. The lower end of the valve cylinder is also provided with an inlet passage P^6 which affords communication between a pipe H and the bore of said cylinder, said pipe being connected to an air or steam supply pipe as shown in Fig. 1. Each of the valve heads S^1, S^2 is provided with a plurality of longitudinal passages S^8 for a purpose which will be hereinafter more fully explained.

Upon the upper end of the pilot valve cylinder an offset vertically disposed arm P^2 is formed. To this arm one end of a lever L is connected, said lever consisting of parallel bars L′ shown in Fig. 2. These bars are also pivotally connected to the valve stem section S^7 by means of a collar L^2 which is provided with trunnions L^3 on which said lever bars are mounted. A second vertically disposed arm P^3 is also formed upon the upper end of the valve cylinder and is provided with a reduced portion which extends between the bars L′. Upon this reduced portion of the arm and beneath the lever bars a sliding collar L^4 is arranged, and between this collar and the body of the arm a spring L^5 is disposed which normally maintains the lever bars in a horizontal position. A float F is arranged in the reservoir or tank and the float rod F^2 extends between the bars L′ of the lever. Upon this rod the adjustable sleeves F^3 and F^4 are arranged. These sleeves are adapted to engage the bars L′ as the float is raised or lowered by the change of level of the fluid in the reservoir to move the valve heads S^1 and S^2.

Upon the upper and lower ends of the pilot valve cylinder the guides P^1 are formed. Frame rods W^2 are vertically movable in these guides and are connected at their upper and lower ends by cross bars as shown. A threaded bolt W^1 is adjustable in the upper cross bar and has its lower end disposed in a socket formed in the upper end of the valve stem section S^7. From the lower cross bar of the sliding frame, the weights W are suspended.

The foregoing description of parts refers to the pilot valve and actuating means therefor which controls the operation of the pump or ejector through the medium of an operating valve which is interposed between the main supply pipe and said pump or ejector.

The construction of this operating valve will now be set forth in detail. The globular case O is connected to the fluid supply pipe and by means of the pipe O^7 to the pump or ejector. A casing O^5 is connected to the valve case O and is closed at its lower end by means of the head O^6. A piston O^2 reciprocates within the casing O^5 and a piston rod O^1 connects this piston with the valve member O^3 which engages with a seat O^4 provided within the globular case O. Adjacent to the point of connection of the rod O^1 to the piston O^2, said rod is formed with a valve face O^8 which engages a seat O^9 at the lower end of an opening formed through the top of said case through which the valve rod moves. A pipe I connects the pilot valve cylinder at a point intermediate of its ends with the head O^6 which is provided with an inlet opening through which steam or compressed air is admitted to the lower end of the piston casing O^5 beneath the piston O^2. The operation of my improved apparatus is as follows. Assuming that the valve heads S^1, S^2 are in the position shown in Fig. 1 of the drawings and that the sleeves F^3, F^4 have been properly adjusted upon the float rod F^2, upon the elevation of said float as the level of the fluid in the tank or reservoir rises, the lower sleeve F^4 engages the lever bars L^1 and elevates the free ends thereof, such elevation of the lever raising the valve stem sections S^7 and S^8 and the heads arranged thereon to open communication between the pipe H and the bore of the pilot valve cylinder. Steam or compressed air is thus admitted to said cylinder from the supply pipe and the same passes around the lower valve head S′ through the grooves S^9 thereof and finds an outlet from the valve cylinder into the pipe I from which it passes into the lower end of the piston casing O^5 and acting upon the piston O^2 raises the same, thus elevating the valve O^3 and admitting the actuating fluid to the pipe O^7 which conducts the same to the pump or ejector. The pump is thus operated to reduce the level of water in the tank or reservoir and when the same reaches the desired level, the upper sleeve F^3 carried by the float rod will engage the lever L and lower the same, thereby also lowering the valve heads S^1 and S^2 and closing communication between the pipe H and the pilot valve cylinder. As the pressure upon the valve member O^3 is greater than that upon the piston O^2, said valve member will be closed and the steam or compressed air will be forced from the lower end of the casing O^5 through the pipe I and into the central portion of the pilot valve cylinder. It is exhausted therefrom through the grooves S^9 in the valve head S^2, said fluid escaping around the stem S^7 through the sleeve or bushing P^7 to the atmosphere. When the valve heads are raised by the pressure of the steam or compressed air upon the lower head S^1, the upper head S^2 engages the seat P^6 and completely closes communication between the interior of the pilot valve cylinder and the atmosphere so that the requisite pressure may be obtained upon the piston O^2 in order to lift the valve O^3.

From the foregoing it is thought that the construction and manner of operation of my improved apparatus will be fully understood. It will be understood that the pilot valve may be arranged at any desired distance from the operating valve and the pump or ejector. The operation of the pump or ejector is automatically controlled so as to maintain the water or other fluid in the tank or reservoir at a desired level. Owing to the fact that but few parts are employed in the construction of the device, it will be obvious that the same can be manufactured at comparatively small cost.

While I have shown and described the preferred construction and arrangement of the various parts, it will be understood that the invention is susceptible of considerable modification in the form, construction and arrangement of the various parts without departing from the essential feature or sacrificing any of the advantages thereof.

Having thus described the invention what is claimed is:—

1. In combination, a pilot valve comprising a cylinder, a compound valve member longitudinally movable in said cylinder consisting of spaced heads, a fluid supply pipe and an operating valve therein, a pipe connecting the supply pipe to one end of the pilot valve cylinder, said cylinder being provided with a passage connecting the pipe with the interior of the cylinder, said cylinder also having a valve seat in each end thereof and an escape port at one end open to the atmosphere, a weighted frame slidably mounted on the valve cylinder and bearing upon said compound valve member to normally hold said member against movement and close communication between the supply pipe and said valve, a second pipe connecting said operating valve with the pilot valve at a point intermediate of said valve heads, said heads each being provided with a plurality of longitudinal grooves, the grooves in one head opening communication between the interior of the valve cylinder and the escape port thereof when the valve is closed, and a float to lift

said valve member against the weight of said frame whereby the pressure fluid is admitted to the connecting pipe between said valves and the escape port simultaneously closed, whereby the operating valve is opened.

2. In combination, a pilot valve comprising a cylinder, a compound valve member movable in said cylinder and consisting of spaced heads forming a fluid receiving chamber therein, said cylinder being provided with a valve seat in each end and an escape port communicating with one of the valve seats and open to the atmosphere, said valve heads being provided with passages opening into said central chamber, a sliding frame mounted upon said cylinder and bearing upon said valve member to normally hold the same against movement, a supply pipe and an operating valve therein normally held in its closed position by pressure from said supply pipe, a pipe connecting the pilot valve to said supply pipe, said pilot valve cylinder having an inlet passage opening upon one of the valve seats, a second pipe connecting said central chamber of the pilot valve with the operating valve, a pivoted lever journaled at one end upon the valve cylinder and connected to said compound valve member, and a float having spaced adjustable collars to engage said lever and move the valve member to its open and closed positions whereby said operating valve is automatically opened and closed.

Signed at New York in the county of New York and State of New York this 4th day of February A. D. 1910.

CHARLES SELIN.

Witnesses:
JOHN H. FEDELER,
WM. J. DAVIS.