No. 684,802. Patented Oct. 22, 1901.

J. G. DUCK.

AUTOMATIC VALVE.

(Application filed Nov. 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

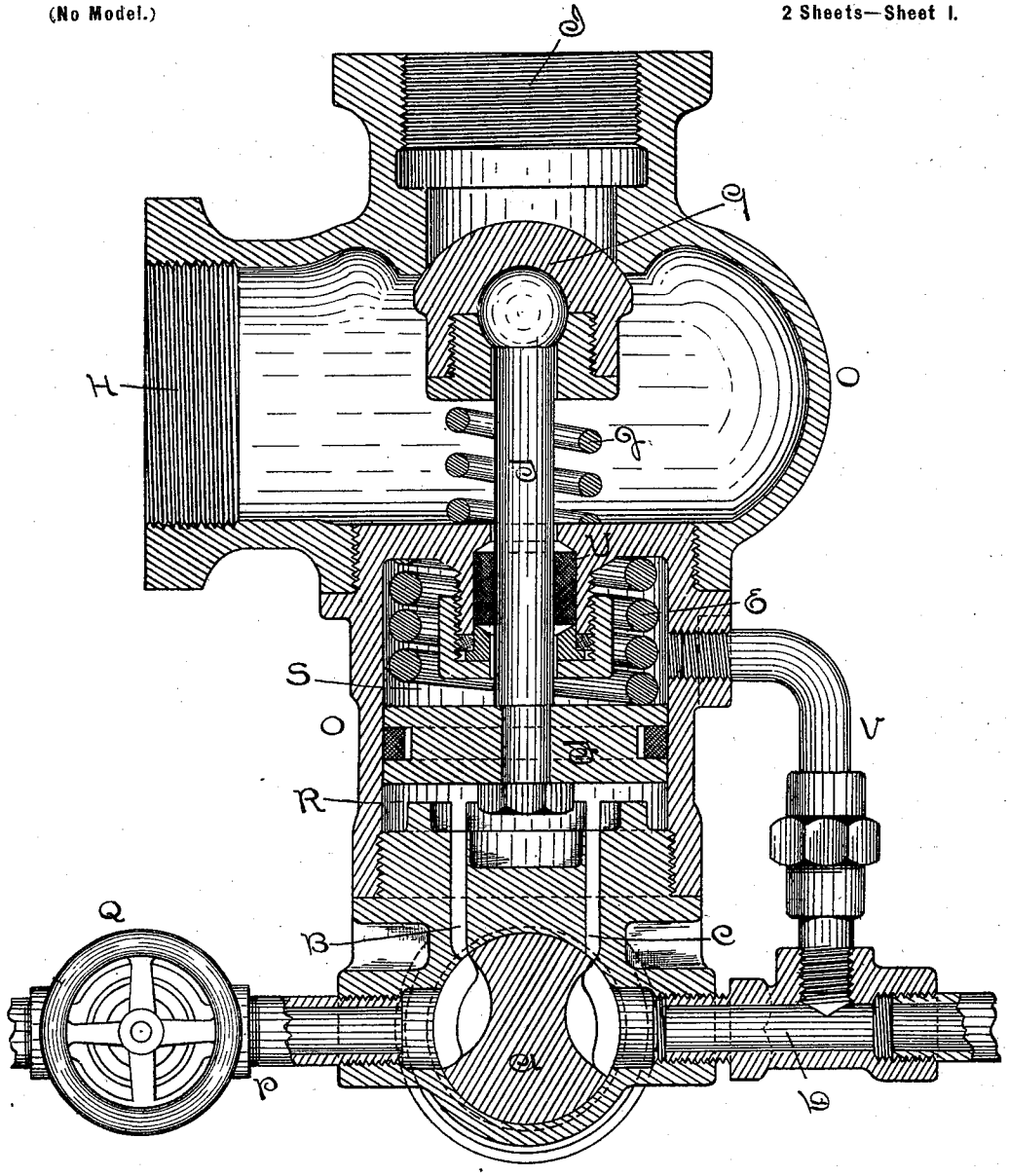

Fig. 1.

Witnesses:
George Oltsch
Hugo Oltsch

Inventor.
J. G. Duck
by Fred. C. Baltz
Atty.

No. 684,802. Patented Oct. 22, 1901.

J. G. DUCK.

AUTOMATIC VALVE.

(Application filed Nov. 13, 1900.)

(No Model.) 2 Sheets—Sheet 2.

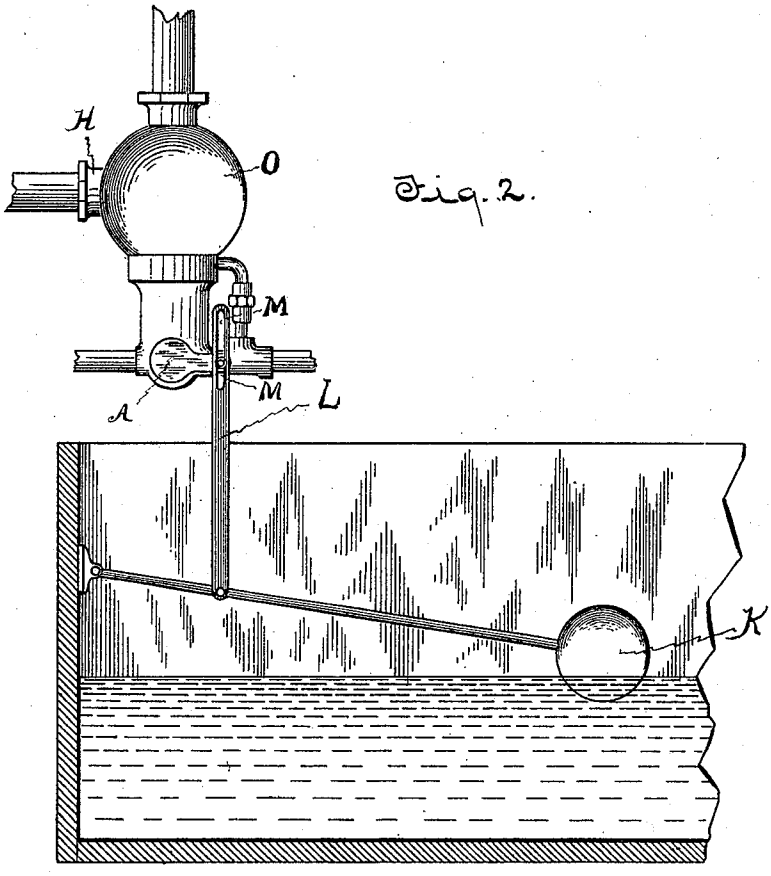

Fig. 2.

Witnesses:
George Oltsch
Hugo Oltsch

Joseph G. Duck.
Inventor
By Theodore Dalton
Atty

UNITED STATES PATENT OFFICE.

JOSEPH GEORGE DUCK, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO WILLIAM D. LABADIE, OF SOUTH BEND, INDIANA.

AUTOMATIC VALVE.

SPECIFICATION forming part of Letters Patent No. 684,802, dated October 22, 1901.

Application filed November 13, 1900. Serial No. 36,358. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH GEORGE DUCK, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Automatic Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in automatic valves to be used in connection with steam-pumps for feeding boilers, ejectors, or injectors; and its object is to provide a mechanism which is automatic in its action and which is brought into play whenever the water in a well rises to a certain height and to cease as soon as the level of the water is lowered to the desired degree.

My invention consists in a plug-valve which is controlled by the rise and fall of a float, steam-passages for the admission and discharge of the steam, a spring-actuated piston or valve which is forced upward against the pressure of its spring by the steam and to which piston or valve a valve-rod is connected, combined with a casing provided with an inlet for the admittance of the steam and an outlet for its discharge and a valve by which the passage of the steam to the ejector is controlled, as will be more fully described hereinafter.

In the accompanying drawings, Figure 1 represents a vertical section of a valve which embodies my invention. Fig. 2 is a view showing the float connected to the plug-valve.

O represents a suitable framework, which is formed of a number of pieces which are screwed together, as shown, and in its lower end is formed a valve-seat, in which a two-way rotating plug-valve A is placed. This valve A has a partially-rotating movement and is controlled by means of a float K in a well or tank, as shown in Fig. 2, and this float is connected to the plug-valve A by means of a rod L, provided with a slot M at one end, in which the arm N on the valve slides. By providing the slot in the rod L the float will be allowed to rise and fall a slight distance before operating the plug-valve. As soon as the water in the well reaches a certain height the float causes the valve A to turn toward the left, and the valve in turning closes the steam-passage B for the admission of live steam and opens the lower end of the passage C, so as to allow the steam to escape through the pipe D. The supply-pipe P is provided with a valve Q, so that the supply of steam can be shut off whenever so desired, and thus the entire apparatus entirely thrown out of action. As long as the valve Q is not closed the apparatus is automatically thrown into and out of action by the rise and fall of the level of the water in the well without any care whatever upon the part of the attendant.

The live steam which passes through the port B enters the steam-chamber R and bears against the lower side of the piston F, which has a vertical movement in the casing O, and to the upper side of which piston in the chamber S is applied the coil-spring E for the purpose of forcing the piston F downwardly as soon as the pressure of steam is automatically shut off by the float connected to the plug-valve A. Connected to the piston F is the valve-rod T, which passes up through a suitable stuffing-box U and which has its upper end made globular, as shown in the steam-passage H.

The upper portion of the casing O is shaped as shown and has the inlet H for the steam and the outlet I, and this outlet I is controlled by the valve G, placed upon the upper end of the valve-stem T. Surrounding the valve-stem and bearing against the under side of the valve G at its upper end and against the bottom of the inlet-passage H is a spring J, which serves as a buffer to lessen the down force of the piston F.

When steam is admitted through the port B by the action of the float upon the plug-valve A, the steam enters the chamber R and forces the piston F upwardly against the action of the spring E. This upward movement of the piston F causes the valve G to close the outlet-pipe I, and thus throw the injector or ejector out of operation. When no steam is admitted through the port B, the pressure of the spring E causes the piston F to drop upon its seat, and the valve G is thus opened, so as to allow the steam to pass freely

to the injector or ejector by the opening of the valve G, which is formed with a ball and socket, so as to always perfectly seat itself. At the same time that the port B is closed the port C is opened, so as to allow any steam in the chamber R to escape through the pipe D.

Connected with the chamber S, in which the spring E is placed, is an escape-pipe V, so that any steam finding admission to the chamber S from above or below will pass off through the pipes V D and freely escape.

This automatic valve is to be used in connection with pumps, injectors, or ejectors for automatically feeding boilers or tanks. If used in connection with an ejector, a valve is placed in the well receiving the water to be ejected and is automatically shut off and turned on by the rise and fall of a float which is connected to the plug-valve A, as above described. When the water in the well rises to a certain height, the float causes the plug-valve to turn to the left, thus closing the live-steam port B and opening the exhaust-port C, allowing the steam to pass out of the exhaust-pipe D. The tension of the spring E being no longer overcome by the pressure of the steam forces the piston down and unseats the valve G, thus allowing the steam to enter the inlet-pipe H and pass through the outlet I to the ejector, which raises the water out of the well.

Having thus described my invention, I claim—

1. In an automatic valve, an inlet-pipe for the steam, a valve controlled by the action of a float, a suitable casing in which the valve is placed, and which is provided with suitable ports for the passage of the steam, a spring-actuated piston, and a valve operated by said piston, combined with suitable inlets and outlets for the steam, which is fed to the ejector and which valves are controlled by the valve operated by the piston, and means to relieve the back pressure on the piston when the valve operated by the same is opened, substantially as shown.

2. In an automatic valve, a suitable casing provided with an inlet and outlet for the steam which is fed to the ejector, inlet and outlet pipes connected to the lower part of the casing, and a two-way plug-valve which is automatically operated by a float, combined with the chambers R and S, formed in the casing, a spring-actuated piston placed between the said two chambers, a valve-rod connected to said piston, and a valve connected to the upper end of the said rod and controlling the feed of the steam to the ejector, substantially as described.

3. In an automatic valve, a suitable casing provided with an inlet and outlet for the steam which is fed to the ejector, a plug-valve automatically operated by a float, a chamber, a spring-actuated piston carrying a valve which controls the outlet for the steam, a port for admitting steam to the chamber and which port is controlled by the plug-valve and exhaust-ports connected with the chamber in which the piston is located, one of which is controlled by the plug-valve, substantially as described.

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

JOSEPH GEORGE DUCK.

Witnesses:
S. A. ECKSTEIN,
HARRY F. HARPER.