

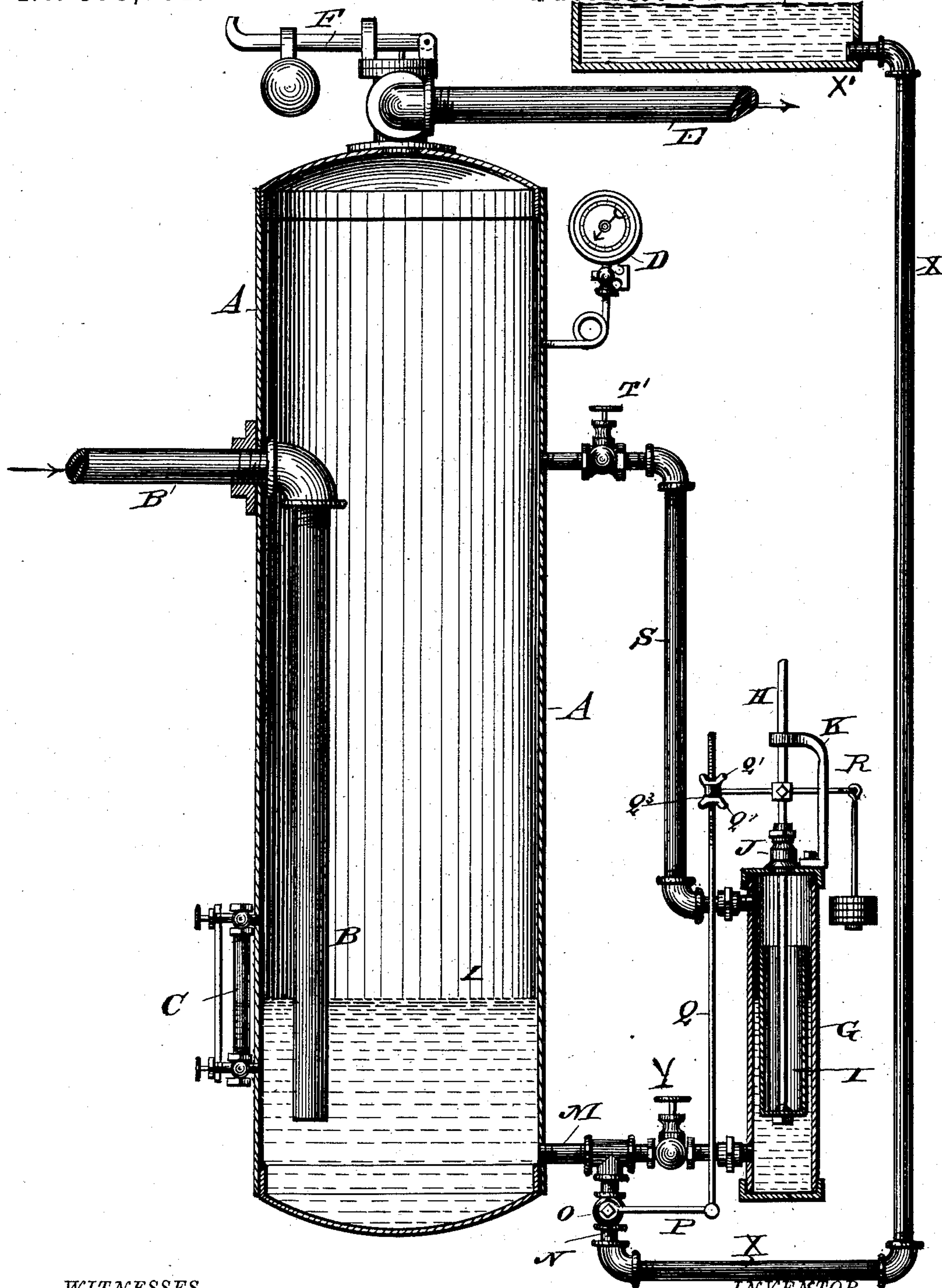
(No Model.)

D. F. McKIM.

AUTOMATIC REGULATOR FOR THE RECEIVERS OF AIR COMPRESSORS.

No. 375,761.

Patented Jan. 3, 1888.



WITNESSES

*Phil. Masi.*  
*Benj. Fugitt.*

INVENTOR

*D. F. McKim*  
*by Anderson & Smith*  
*his Attorneys*



# UNITED STATES PATENT OFFICE.

DAVID FRANKLIN McKIM, OF CABLE CITY, MONTANA TERRITORY.

AUTOMATIC REGULATOR FOR THE RECEIVERS OF AIR-COMPRESSORS.

SPECIFICATION forming part of Letters Patent No. 375,761, dated January 3, 1888.

Application filed April 27, 1886. Serial No. 200,336. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID FRANKLIN McKIM, a citizen of the United States, resident at Cable City, in the county of Deer Lodge and Territory of Montana, have invented certain new and useful Improvements in Automatic Regulators for the Receivers of Air-Compressors; and I do 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, reference being had to the accompanying drawing, and to letters or figures of reference marked thereon, which form a part of this specification.

The figure of the drawing is a representation of my improvement in vertical section.

The object of my invention is to combine an automatic regulator with the receiving-cylinder of an air-compressor, whereby a continuous regulated flow of air may be introduced into a mine-shaft without waste of the water used to operate the said regulator. This object I accomplish by means which will be fully understood from the following description, taken in connection with the annexed drawing.

Referring to the drawing by letter, A designates an air-receiver of any suitable capacity, with which a suitable air-forcing engine (not shown) communicates by means of an induction-pipe, B, which enters the said receiver near its upper end and dips down nearly to the bottom thereof into a body of water. This receiver A is provided with a transparent water-gage, C, which indicates the height of water, and is also provided near its upper end with a suitable passage-gage, D. From the top of the receiver A extends an air-blast pipe, E, provided with a safety-valve, F, which pipe will in practice lead into the shaft of a mine for conducting air therein to ventilate the same.

S designates a pipe which leads out of the air-space of the receiver A and enters the air-space of a vertical cylinder, G, near the upper end thereof, which pipe is provided near its outlet from the receiver A with a hand regulating-cock, T'. Below the lowest water-level in the receiver A and branching from this receiver is a pipe, M, which communicates

with the lower part of the cylinder G below the lowest water-level therein, which pipe is provided with a hand regulating-cock, Y. Between the cock Y and the receiver A a short pipe, N, communicates, by means of a T-coupling, with the pipe M, which pipe N is provided with an oscillating cock, O, having a lever, P, secured to its stem. The lower end of the said pipe N is also coupled with the lower end of a stand-pipe, X, leading from an elevated tank, X', or other convenient head of water located above the receiver A.

Inside of the cylinder G, which is tightly closed at both ends, is a cylindrical hollow float, I, which has connected to it a vertical rod, H, that passes through a stuffing-box, J, and is guided above this box by a bracket, K.

To the lever P, above referred to, a connecting-rod, Q, is pivoted, the upper screw-threaded portion of which receives freely an eye, Q<sup>3</sup>, which is on one end of a loaded lever, R, and above and below this eye are jam-nuts Q', by means of which the opening of the cock can be regulated with respect to the pressure of the column of water in the pipe X and the position of the float I in the cylinder G.

In operation cocks T and Y are opened more or less, according to the head of water and pressure of air desired, and the opening of cock O is regulated accordingly by adjusting the jam nuts Q' Q' and loading the lever R, which is attached to the float-rod H, as shown in the drawing. The air-forcing engine is started and the receiver charged with air under a given pressure regulated by the head of water above described, which water is forced upward in the receiver A against the column of air therein. Should the initial pressure and volume of air of the receiver be increased, a given quantity of water will be forced out of the receiver A, and consequently out of the cylinder G, back into the tank X', thus increasing the height of the column of water. This will react, through the float and its loaded lever, upon the cock O and reduce the inlet through the latter. In like manner should the pressure of air in the receiver be diminished the cock O will be opened more or less to increase the influx. By these means I am able to automatically control the efflux or blast of air issuing from the pipe E.

Having described my invention, I claim—

The combination, with the air-receiver A, provided with an air-supply pipe and an air-blast pipe, of a hydraulic automatic regulator  
5 consisting of a cylinder provided with a float and communicating with the air and water spaces of the said receiver by pipes provided with cocks, a stand-pipe, X, leading from an elevated source of water and communicating  
10 with the pipe M, connecting the air-receiver

and the float-cylinder, and a cock, O, located in pipe X and adjustably connected to a loaded lever, which is attached to the stem of said float, all substantially as described.

In testimony whereof I affix my signature in 15 presence of two witnesses.

DAVID FRANKLIN McKIM.

Witnesses:

G. A. SMITH,  
AUSTIN SHOTT.