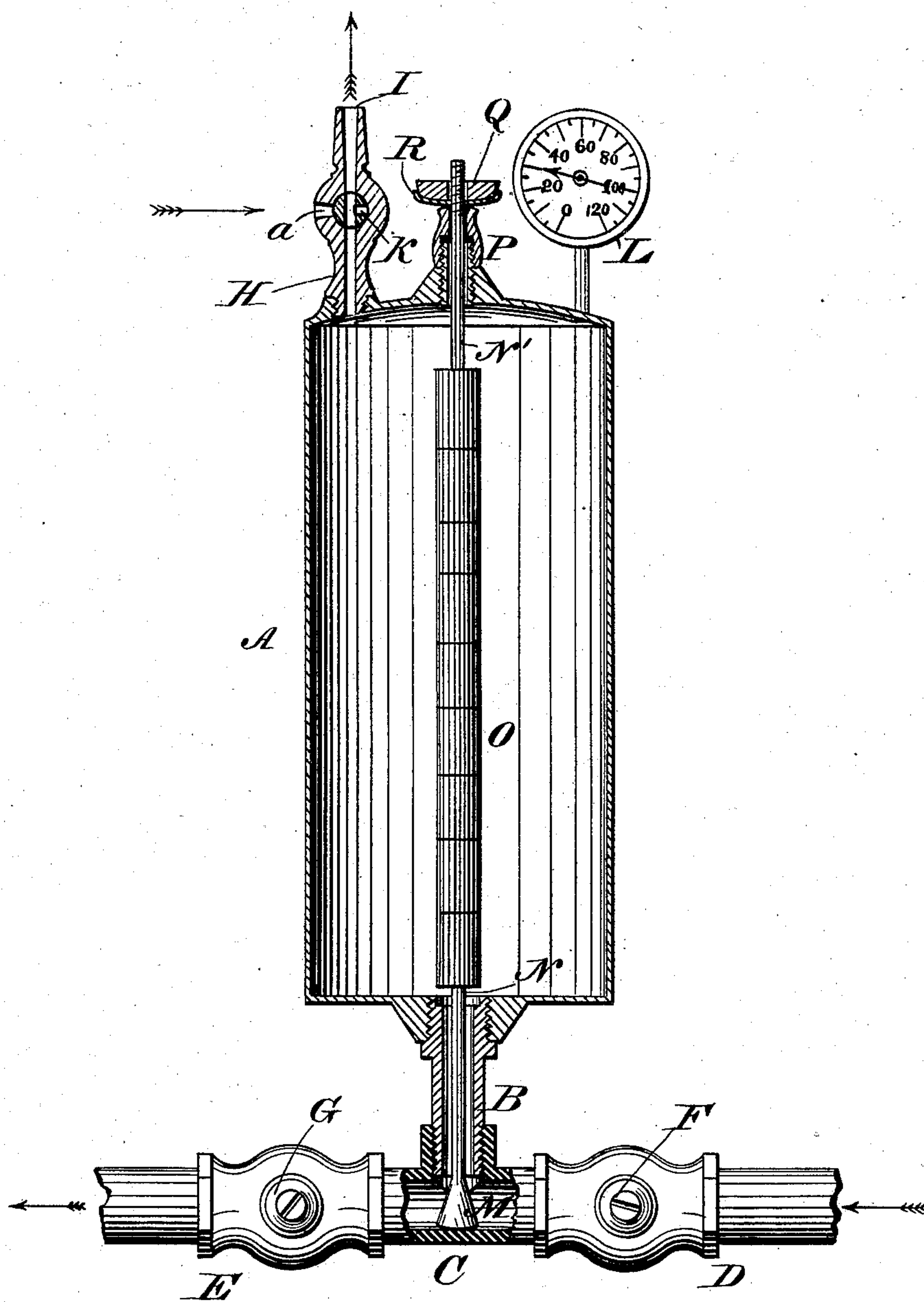


(No Model.)

W. R. FREEMAN.
Hydraulic Air Compressor.

No. 238,225.

Patented March 1, 1881.



WITNESSES:

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WILLIAM R. FREEMAN, OF SAN ANTONIO, TEXAS.

HYDRAULIC AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 238,225, dated March 1, 1881.

Application filed May 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. FREEMAN, of San Antonio, in the county of Bexar and State of Texas, have invented a new and Improved Hydraulic Air-Compressor, of which the following is a specification.

The principal object of my invention is to provide the cylinder with a pressure and water regulating device.

In the following description reference is had to the accompanying drawing, in which the figure is a vertical longitudinal section of my compressor, shown as connected by a T to the water-supply and waste pipes, so much of the T being shown broken away as is necessary to show the water-regulating valve.

A is the compressing-cylinder, which is connected by the coupling B and T-piece C to the water-supply pipe D and waste-pipe E, which pipes are respectively provided with stop-cocks F and G. At the opposite extremity of the cylinder are the air-pipe H and the pressure-gage L. The air-pipe is provided, as shown, with an enlargement having in one side the air-inlet *a*. In said enlargement is a three-way cock, K, by means of which the air may either be admitted to the compressing-cylinder through air-inlet *a* or the compressed air may be permitted to pass from the cylinder through pipe H and nozzle I to the place where it is to be used or stored, the nozzle I of course being provided with suitable conducting hose or pipe.

Thus far the operation of the machine is the same as that of hydraulic air-compressors already well known, viz: The compressing-cylinder being filled with air or gas, as the case may be, the air-inlet is closed, as is also the waste-water cock. The water-supply cock is opened, allowing the water to rise in the cylinder, compressing the air or gas therein to a tension equal to the water-pressure, and indicated by the pressure-gage. Communication being then opened by means of the three-way cock between the compressing-cylinder and the nozzle I, the air is allowed to pass to the place of storage or use. The air-cock is then turned to communicate with the outer air or gas supply, the water-supply cock is closed, and the waste-cock opened, allowing the water to escape from the compressing-cylinder,

which at the same time becomes filled with air or gas, and the operation repeated. It is frequently desirable, however, that the air be driven from the compressing-cylinder through the conducting-pipe while water is being admitted to the cylinder. In such case, to prevent the water from rising into the air-conducting pipe I have invented and applied to the described air-compressor an automatic regulating device.

In the lower end of the connecting-piece B, or in that part of the T connecting therewith, I provide a seat for the valve M, formed upon or attached to the lower end of the stem N N', the upper end of which passes through the upper end of the compressing-cylinder and through the stuffing-box P.

To the valve-stem is attached the float O, of sufficient buoyancy to sustain the weight of the valve and valve-rod and some additional weight, which latter is either supplied by the necessary change in the material or size of the upper end, N', of the valve-rod, or by attaching to the upper end weights Q, placed, it may be, in a cup, R, space being left for additional weights, when desired, as in case the water pressure should from some cause be varied.

From the foregoing the operation of this part of the machine will be readily understood to be as follows: The water-supply being opened, as in the operation of the compressor first described, the water rises in the compressing-cylinder until it reaches a height at which the buoyancy of the float overcomes the resistance of the weight of the valve, the valve-rod, and the additional weight placed at or upon the upper end of the valve-rod, when the valve closes and remains closed until the waste is opened or the water-pressure diminishes.

The action of the valve-rod, or portion thereof passing through the stuffing-box P, is such as to regulate the pressure in the cylinder, as follows: The desired pressure inside the cylinder being determined upon, the proper weights attached to the rod, the pressure having reached the desired limit, the valve-rod is driven through the stuffing-box, causing the valve to close and prevent any increase of pressure by shutting off the water. As the pressure decreases in the cylinder the weight

of the valve-rod, valve, and weights overcomes the pressure and opens the valve, admitting additional water and regulating the pressure until such time as the action of the float is
5 necessary to prevent the water from rising high enough to enter the air or gas pipes, as above described.

It is obvious that the float O may either be rigidly attached to or form a part of the valve-
10 rod, or it may slide upon it, its motion being limited by projections upon the rod.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In combination with the air-compressing 15 cylinder, and its connections B C with the water-supply, the valve M, valve-rod N N', float O, and stuffing-box P, the upper end, N', of the valve-rod being weighted, all substantially as described, and for the purpose set 20 forth.

WILLIAM R. FREEMAN.

Witnesses:

ROBT. PARKER,
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