

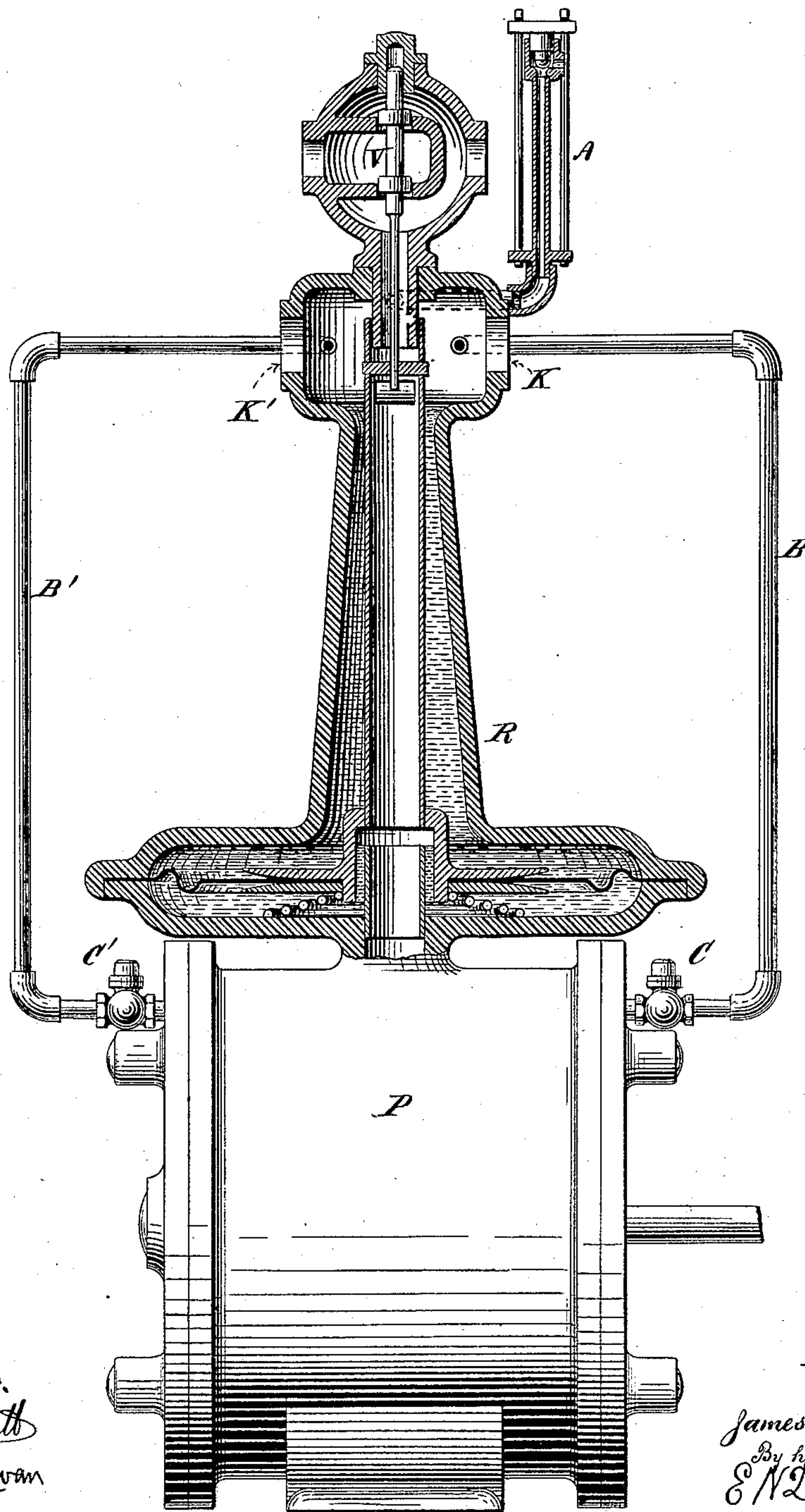
(No Model.)

J. H. BLESSING.

APPARATUS FOR FREEING PUMPS FROM AIR.

No. 245,934.

Patented Aug. 23, 1881.



Witnesses:
Geo. H. Mott
S. J. Sullivan

Inventor:
James H. Blessing,
By his Attorney
E. W. Dickerson

UNITED STATES PATENT OFFICE.

JAMES H. BLESSING, OF ALBANY, NEW YORK.

APPARATUS FOR FREEING PUMPS FROM AIR.

SPECIFICATION forming part of Letters Patent No. 245,934, dated August 23, 1881.

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To all whom it may concern:

Be it known that I, JAMES H. BLESSING, of the city of Albany and State of New York, have invented a new and useful Improvement
5 in Apparatus for Freeing Pumps from Air, of which the following is a full, true, and exact description, reference being had to the accompanying drawing.

My invention relates to a method of freeing
10 a pump which is returning water to a boiler or engaged in similar work of the air which may become lodged in it by passing in with the water-supply by returning such air into the circulation or supply from which the water
15 is drawn to the pump.

In the form indicated in the drawing my invention is shown in combination with a regulator which regulates the steam supplied to a pump by the water supplied to the water end
20 of said pump; but I do not limit myself to this specific method, but consider my invention, broadly stated, to consist in a method of returning into the circulation or water-supply which is drawn into a pump the air which may
25 escape in said pump.

My apparatus will be readily understood from the accompanying drawing, which represents a view, in vertical section, of my apparatus; and it consists, generally, of a pump, P,
30 which is operated by a suitable steam-cylinder. (Not shown.) Upon this pump is shown a regulator, R, of the form patented to me August 27, 1878, No. 207,485, to which patent I refer for a fuller description, and it is sufficient
35 to say that this apparatus R controls the steam-supply which operates the pump P by means of valve V. Connected to this regulator R is an air-valve, A, which may be of any suitable form.

My apparatus, in the form shown, is designed to be attached to the circulation of the steam-heating apparatus of a building, and the water of condensation may enter the regulator by one or more apertures, K K'. In apparatus
40 of this kind the pressure in the coils, and consequently in the upper part of the regulator R, may be very much less than the boiler-pressure, as is always the case where the exhaust-steam from an engine is used to heat the building.
45 It is a well-known fact that in such apparatus free air is liable to be disengaged

from the water at different points on its return to the boiler, and it frequently happens in practice that the return-cylinder P becomes so choked with air which is so disengaged as to
55 refuse to operate in returning water to the boiler. My contrivance, as shown, will free this cylinder of the air which may become lodged in it. Connected with each side of the piston of the pump P if it is a double-acting
60 piston, or with one side if it is a single-acting piston, is a pipe or pipes, B B', in which are placed check-valves C C'. These pipes connect with some space in connection with the water-supply, in which, in case the water-
65 supply is under pressure, an air-valve is arranged. In the form shown they connect with the upper part of the regulator R, with which the air-valve A also connects. It is plain that the pipes B B' might be joined before entering
70 the upper chamber of the regulator.

The operation can now be readily understood. The pressure in the cylinder P at each stroke of the pump is necessarily greater than the pressure in the regulator R and return-coils, and, if such regulator is not used, than
75 the pressure in the water-supply. Therefore at every stroke of the piston of the pump P a small quantity of air and water, or water, as the case may be, will be forced through the
80 pipes B B' past check-valves C C' and delivered into regulator R, whence the air escapes through air-valve A and the water again flows downward and into the pump P. A very
85 small opening is sufficient to free a pump of the air which may accumulate in it. The check-valves C C' prevent the return of the air into the pump. But it should be understood that where the flow of water is sufficient to keep
90 the pipes full below the openings K K', or where the level of the water-supply is above the pipes B B', it is not necessary to employ said check-valves.

By my invention as applied to steam-coils there is no escape or communication with the
95 atmosphere whatever, except the escape of the air through the automatic air-valve A, and, as matter of fact, this device will make many arrangements of this class operative which before would refuse to operate without the constant
100 attendance of an engineer to free the pump of air.

Another and very important advantage of this contrivance is that the water which necessarily escapes with the air whenever an air-valve is connected with a pump is returned into the water-supply which is passing to the pump, and consequently no water is lost, and the apparatus can be kept entirely closed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a pump for pumping water under pressure, an air-pipe connected with said pump and arranged to deliver into the water-chamber through which the water is passing to the pump, substantially as described.

2. In a double-acting pump for pumping water under pressure, air-pipes connected with both sides of said pump and arranged to deliver into the water-chamber through which the water is passing to the pump, substantially as described.

3. In a pump for pumping water under pressure, an air-pipe connected with said pump and provided with a check-valve, and arranged to deliver into the water-chamber through which the water is passing to the pump, substantially as described.

4. In a pump for pumping water under pressure, two air-pipes connected with both sides of said pump, and each provided with a check-valve and arranged to deliver into the water-chamber through which the water is passing to the pump, substantially as described.

5. In an apparatus for returning water under pressure into a boiler under pressure, an air-pipe connected with the water-chamber of the pump and delivering into a closed chamber through which the water is passing to the pump, which chamber is provided with an air-valve, substantially as described.

6. In an apparatus for returning water under pressure into a boiler under pressure, two

air-pipes connected with both sides of a double-acting pump and delivering into a closed chamber through which the water is passing to the pump, which chamber is provided with an air-valve, substantially as described.

7. In an apparatus for returning water under pressure into a boiler under pressure, an air-pipe provided with a check-valve connected with the water-chamber of the pump and delivering into a closed chamber through which the water is passing to the pump, which chamber is provided with an air-valve, substantially as described.

8. In an apparatus for returning water under pressure into a boiler under pressure, two air-pipes, each provided with a check-valve connected with both sides of a double-acting pump and delivering into a closed chamber through which the water is passing to the pump, which chamber is provided with an air-valve, substantially as described.

9. The combination of a pump, a pump-regulator through which the water-supply passes to the pump, and which is provided with an air-valve, and a pipe connecting the water-chamber of the pump to the chamber of the regulator connected with the air-valve, substantially as described.

10. The combination of a pump, a pump-regulator through which the water passes to the pump, which regulator is itself provided with an air-valve, and an air-pipe provided with a check-valve which delivers into the chamber of the regulator connected with the air-valve and is connected with the pump, substantially as described.

JAMES H. B. ING.

Witnesses:

S. F. SULLIVAN,
WM. A. POLLOCK.