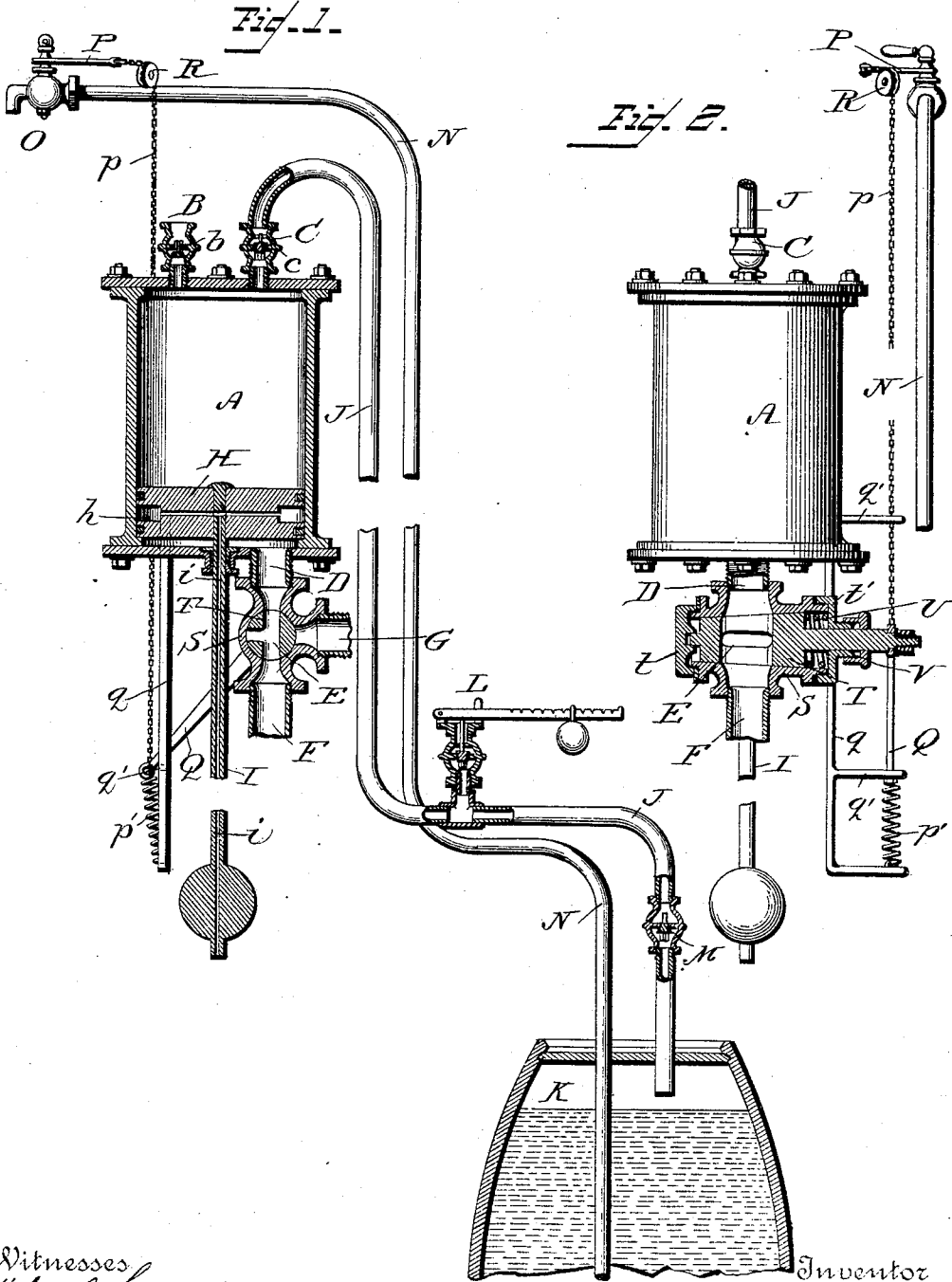


(No Model.)

R. F. AVERY.  
AIR PUMP OR COMPRESSOR.

No. 482,776.

Patented Sept. 20, 1892.



Witnesses  
*Albert E. Spiden*

Inventor  
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# UNITED STATES PATENT OFFICE.

RUSSELL F. AVERY, OF SPOKANE FALLS, WASHINGTON, ASSIGNOR TO JACOB GOETZ, TRUSTEE, OF SAME PLACE.

## AIR PUMP OR COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 482,776, dated September 20, 1892.

Application filed April 13, 1891. Renewed July 19, 1892. Serial No. 440,519. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL F. AVERY, residing at Spokane Falls, in the county of Spokane and State of Washington, have invented a new and useful Machine for Drawing Liquids from Inclosed Vessels, of which the following is a specification.

My invention relates to an improvement in air compressors or pumps for drawing liquids from vats, casks, or other inclosed vessels by compressing air in a cylinder by means of hydraulic pressure or other pressure, the object being to preserve a uniform pressure of air within the vessel and to attain this result by turning the faucet from which the liquid is to escape. I attain these objects by mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire machine. Fig. 2 is a vertical section of the same on the line 2 2 of Fig. 1.

A is a cylinder in which the air is compressed, the size of which is proportionate to the amount of liquid to be drawn each time the apparatus is operated.

B is an air-inlet, and C an air-outlet, each provided with check-valves *b c*.

D is a pressure-inlet.  
E is a three-way valve located in said pressure-inlet and connecting with the outlet-tube F and the tube G, through which the head of water or other source of pressure is admitted to the cylinder A.

H is a piston reciprocating in said cylinder and having a weighted piston-rod I, the weight of which serves to return the piston to its normal position when the pressure in the cylinder is removed by opening the pressure-outlet tube F.

J is a tube connecting the air-outlet C with the closed vessel K, which contains the liquid to be drawn.

L is a safety-valve which regulates the air-pressure admitted to the vessel K and, in connection with the valves *c* and M, maintains the normal pressure within said vessel.

N is a tube conveying the liquid in the vessel K to the faucet O.

P is a lever controlling the faucet and connected by a chain *p* with the lever-arm Q of the three-way valve E.

*q* is a standard projecting from the cylinder and having stops *q' q'* to limit the throw of the lever-arm Q, and *p'* is a spring connecting the latter with the standard.

R is a pulley over which the chain passes.

The three-way valve E, which forms the subject of another application, Serial No. 402,595, filed August 13, 1891, consists of the case S, having the plug T, which bears on the cap *t*, against which it is held tight in its seat by the cap *t'*. A small spring U fits over the plug T inside the casing, and a packing-nut V holds the plug in place and prevents any possible outside leakage of the valve E.

The piston-head H, which forms the subject of another application, Serial No. 402,594, filed August 13, 1891, has a circumferential groove *h*, through which any water or other liquid which might succeed in passing the first ring drains off through the channel *i* in the tubular piston-rod I, with which it communicates. This tubular rod I may be connected to a waste-pipe by rubber hose, if desired.

Assuming the apparatus to be in the position shown in Fig. 1, its operation is as follows: On opening the faucet O to draw a glass of liquid the three-way valve E is turned by means of lever-arm P and chain *p*, so as to open the pressure-inlet G and admit the water or other medium to the cylinder A, whereupon the piston H rises, compressing the contained air, which closes the inlet-valve *b*, opens the outlet-valve *c*, and when sufficiently compressed passes the valves L and M into the vessel K, from whence it forces the liquid out through the faucet O. When the piston has reached the top of the cylinder, the liquid ceases to flow from the faucet O, and on closing the faucet the spring *p'* reverses the three-way cock E, opens the pressure-outlet, and the piston H falls until it reaches the bottom of the cylinder. As soon as the piston in the cylinder begins to fall, the air-pressure in the vessel K closes the valves M L *c*, and the apparatus stands ready for the next operation.

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

1. The combination of a cylinder, a piston, a weighted piston-rod, an inlet and outlet at

one cylinder-head, connected with a source of pressure, a valve controlling said pressure inlet and outlet, an air-inlet and an air-outlet at the other cylinder-head, a receptacle for liquids, a connecting-pipe between said air-outlet and receptacle, a check-valve in said

5 air-inlet, a faucet for drawing the liquid from the receptacle, and suitable connections between the faucet and the valve controlling  
 10 said pressure inlet and outlet, substantially as described.

2. The combination of a cylinder, a piston, a weighted piston-rod, an inlet and outlet at  
 15 one cylinder-head, connected with a source of pressure, a valve controlling said pressure inlet and outlet, an air-inlet and an air-outlet in the other cylinder-head, a receptacle for  
 20 liquids, a connecting-pipe between said air-outlet and receptacle, a check-valve and regulating-valve in said pipe, a check-valve in said

air-inlet, a faucet for drawing the liquid from the receptacle, and suitable connections between the faucet and the valve controlling said pressure inlet and outlet, substantially as described.

3. The combination of the cylinder A, having the outlet C and inlet B, the check-valves therein, the pressure-inlet having the three-way valve E, its actuating-lever arm Q, the connecting-pipe G, the piston-head H, having  
 30 the weighted piston-rod I, the receptacle K, the connecting-tube having the valves L and M, the faucet O, its connecting-tube, its lever-arm P, chain *p*, and spring *p'*, connecting it  
 35 with lever-arm Q of the valve E, substantially as described.

RUSSELL F. AVERY.

Witnesses:

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