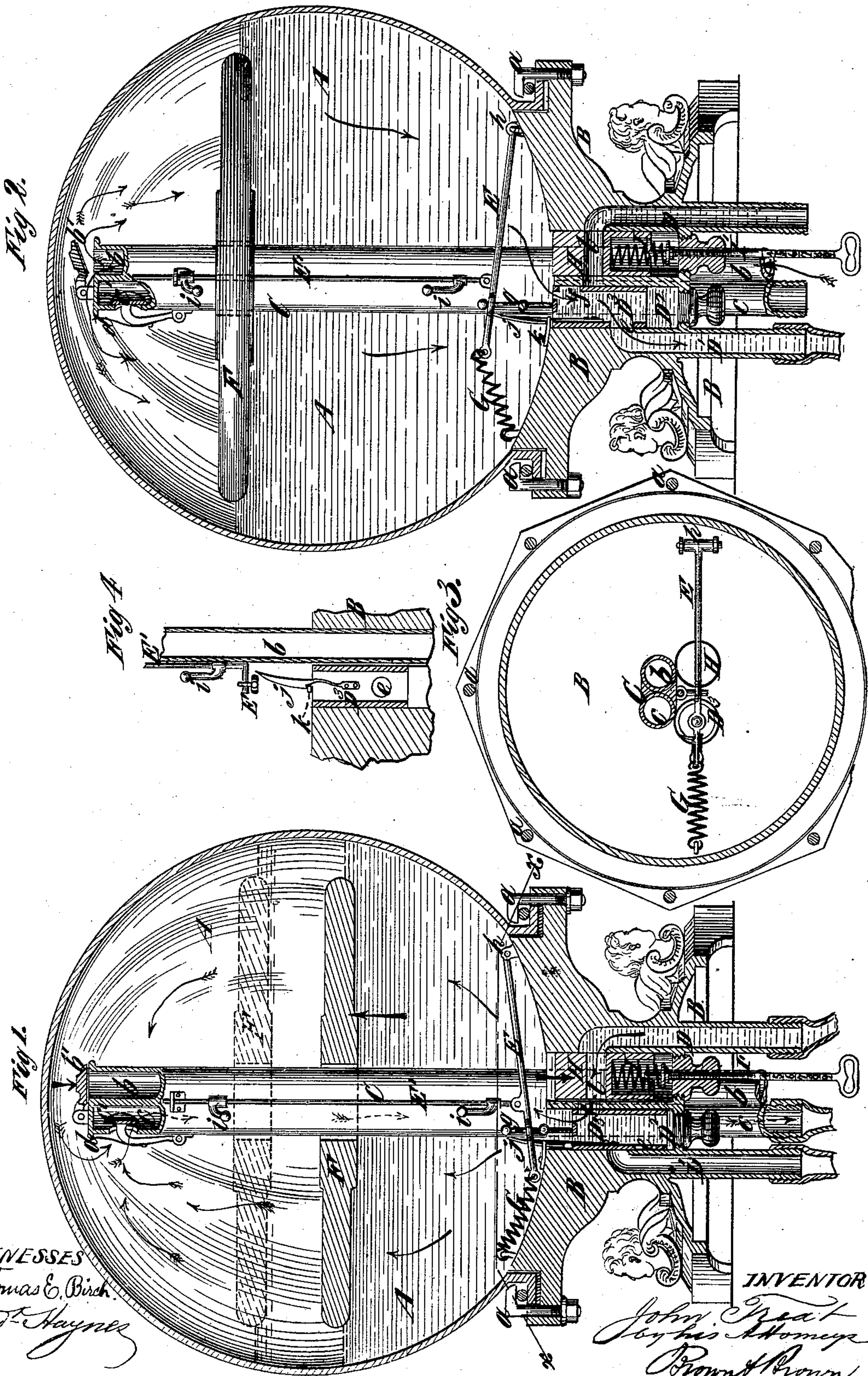


J. TREAT.
Apparatus for Compressing Air.

No. 221,126.

Patented Oct. 28, 1879.



WITNESSES
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UNITED STATES PATENT OFFICE.

JOHN TREAT, OF NEW YORK, N. Y., ASSIGNOR OF ONE-THIRD OF HIS RIGHT
TO JOHN KARST, OF SAME PLACE.

IMPROVEMENT IN APPARATUS FOR COMPRESSING AIR.

Specification forming part of Letters Patent No. **221,126**, dated October 28, 1879; application filed
September 13, 1879.

To all whom it may concern:

Be it known that I, JOHN TREAT, of the city of New York, in the county and State of New York, have invented new and useful Improvements in Apparatus for Compressing Air, of which the following is a specification.

The object of my invention is to provide a simple and inexpensive apparatus for compressing air by the use of water-pressure as a motive power. Such an apparatus may be used for supplying compressed air for various purposes; but it is intended especially for use in bar-rooms, hotels, &c., for compressing air to be conducted to a barrel or cask of liquor, and employed to displace the liquor in the barrel or cask and force the same upward to the bar, where it may be drawn from a faucet for use. When so used, the water for operating my apparatus may be taken from an elevated tank, or from the street-main in places where public water-works are in use.

My invention consists in the combination, with an air-tight chamber or vessel having an air-inlet and an air-outlet provided with suitable valves, and a water-inlet and a water-outlet, also provided with a suitable valve or valves, of a regulator-valve consisting of a piston which is provided with a port or opening extending transversely through it communicating with the water-inlet, and which, when the air-pressure in said chamber or vessel increases to a certain point, is moved so as to close the said water-inlet.

A spring is preferably employed in connection with such regulator-valve for keeping the same open when not otherwise actuated, and means whereby the resistance of said spring may be varied to increase or diminish the pressure of the compressed air.

It also consists in the combination, with such a chamber or vessel having an air inlet and outlet provided with suitable valves, and a water inlet and outlet, also provided with a suitable valve or valves, of a float for operating said water valve or valves and a spring for aiding said float.

It also consists in various details and combinations of parts hereinafter to be explained.

In the accompanying drawings, Figure 1 represents a central vertical section of my ap-

paratus. Fig. 2 represents a similar section of said apparatus at a different stage of its operation. Fig. 3 represents a horizontal section on the dotted line *xx*, Fig. 1; and Fig. 4 represents a detail view of the water inlet and outlet valve and certain appurtenances thereof.

Similar letters of reference designate corresponding parts in all the figures.

A designates an air-tight chamber or vessel, and B a stand or base upon which it is mounted, and to which it is secured by means of bolts *a*. In order that the operation of the apparatus may be clearly seen, and to enhance its appearance, the chamber or vessel A is preferably made of glass.

C designates a pipe or column extending upward from the base and divided, so as to form two passages or ducts, *b c*. The passage or duct *b* serves as the air-inlet, and is provided with an inwardly-opening valve, *b'*, and the passage or duct *c* serves as the outlet for compressed air, and is provided with a valve, *c'*, opening outwardly against the resistance of a spring, *d*.

D designates the water-inlet of the chamber or vessel A, and D' the water-outlet thereof. Both the water inlet and outlet communicate with a passage, D², in which is a vertically-moving cylindrical valve, D³, provided in its sides with openings *ef*, which communicate, alternately, one with the water-inlet D, and the other with the water-outlet D'.

At the upper end of the valve D³ is a rod, *g*, with which engages a lever, E, hinged at *h* to the base B, and connected to the lower end of a vertical rod, E', supported in guides upon the pipe or column C.

F designates a float fitting loosely upon the pipe or column C, and rising and falling with the level of the water in the chamber A.

Upon the rod E' are tappets *i*, with which the float F alternately comes in contact in its rise and fall, and by which it serves to move the rod E', and, through the lever E, to shift the valve D³.

As here represented the lever E has a considerable amount of play on the valve-rod *g*, between collars thereon, and has connected to its end a spring, G.

In moving the lever E from either direction

toward a horizontal position the spring G is compressed, and the said lever exerts no power on the valve D³ until it reaches such horizontal position. As soon as the horizontal position is passed the spring G, acting on the lever E, accelerates its movement and serves to shift the valve D³.

As represented in Fig. 1, the valve D³ is in its lowest position, its opening *f* being opposite the water-inlet D. When in such position the water passing up into the chamber A compresses the air therein and forces the compressed air through the valve *c'* down the passage or duct *c* to the barrel, cask, or other receptacle where it is required.

As represented in Fig. 2, the valve D³ is in its highest position, its opening *e* being opposite the water-outlet D'. When in such position the water passes out of the chamber A and air enters through duct or passage *b* and valve *b'*.

In order to hold the valve D³ in its elevated position, I have represented a catch, *j*, (see particularly Fig. 4,) extending from its upper part, which, when the valve is raised, engages with a stop, *k*, on the base B. The catch *j* is provided with an inclined face, and as the lever E is moved downward by the float it impinges against said inclined face and disengages the catch from the stop *k*, whereupon, if the valve D³ be made sufficiently heavy, it will fall of its own weight.

H designates a regulator-valve arranged in the base B, consisting of a piston having a port or opening, *l*, extending transversely through it, and communicating with the water-inlet D.

I designates a spring arranged between the valve H and a movable follower actuated by a screw, I', which may be adjusted to increase or diminish the resistance of the said spring, and is represented as having marked upon it figures to indicate the degree of adjustment.

When the pressure of air in the chamber A becomes too great the regulator-valve H is forced downward by the pressure against the resistance of the spring I, and closes the water-inlet. By adjusting the screw I' the pressure of the air compressed by the apparatus may be nicely regulated.

My apparatus is intended to be automatic in its action, and when the air-outlet pipe is connected to a barrel or cask filled with liquor the apparatus will maintain a constant air-pressure in the said barrel or cask sufficient to force the liquor contained therein to an upper floor of the building.

By my invention I produce a simple and inexpensive apparatus, very ornamental in appearance, and the operation of which, when set on a bar, is very interesting; and I also enable the ale and liquor pumps heretofore in use to be dispensed with.

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

1. The combination, with an air-tight chamber or vessel having an air inlet and outlet provided with suitable valves, and a water inlet and outlet, also provided with a suitable valve or valves, of a regulator-valve consisting of a piston which is provided with a port or opening extending transversely through it, communicating with the water-inlet, and which, when the air-pressure in said chamber or vessel increases to a certain point, is moved so as to close the said water-inlet, substantially as specified.

2. The combination, with an air-tight chamber or vessel having an air inlet and outlet provided with suitable valves, and a water inlet and outlet, of a single valve for establishing communication between the said water-inlet and the chamber or vessel, or between the said chamber or vessel and the said water-outlet, a movable rod for actuating said valve, and a float for actuating said rod, substantially as specified.

3. The combination, with the valve D³ and its shouldered rod *g*, of the hinged lever E, loosely fitting upon said rod, the spring G, connected to the end of the said lever, the movable rod E', connected to said lever, and the float F, for operating said rod.

4. The combination, with the chamber or vessel A, provided with a water-inlet, D, and a water-outlet, D', of the regulator-valve H, the spring I, acting upon said valve, and the movable follower and screw I', for increasing or diminishing the resistance offered by said spring, substantially as specified.

5. The combination, with the valve D³, of a catch, *j*, connected thereto, adapted to engage with a stop, *k*, when said valve is raised, a lever, E, fitting loosely upon the valve-stem *g*, and adapted, when it is depressed, to act upon the inclined face of the catch *j* and release the said valve, substantially as specified.

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Witnesses:

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