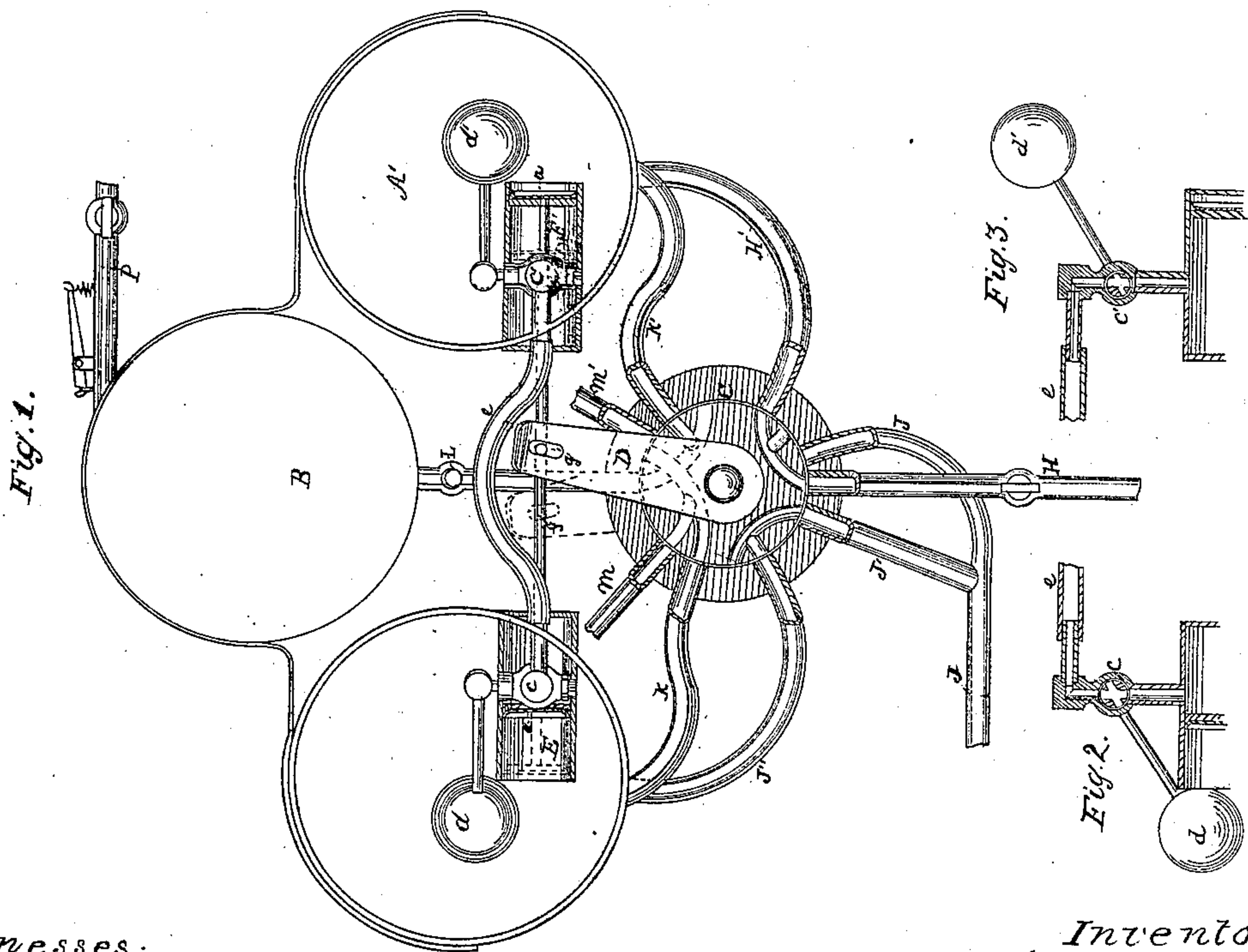
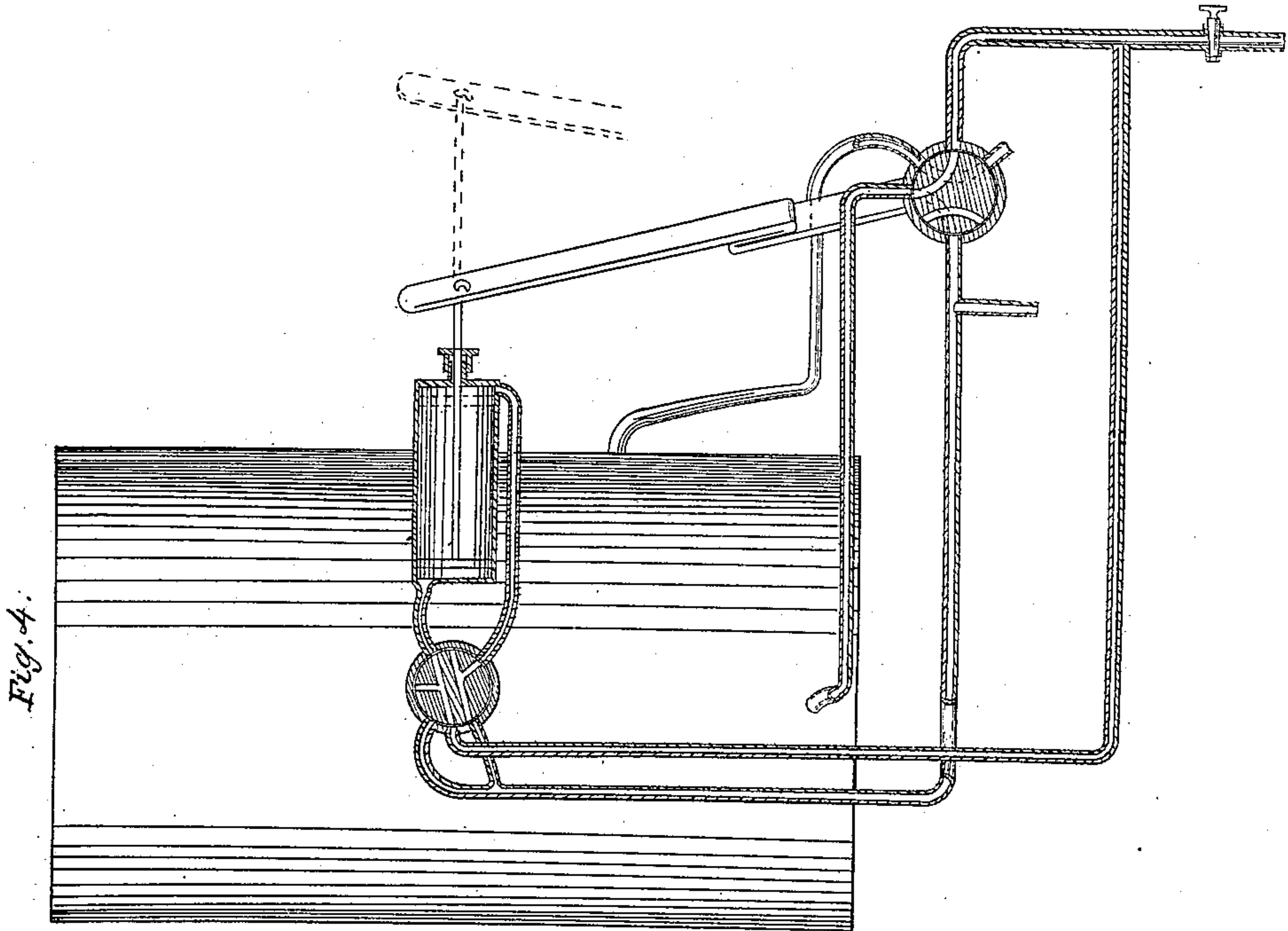


H. J. BAILEY.
AIR CONDENSING APPARATUS.

No. 73,283.

Patented Jan. 14, 1868.



Witnesses:
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H. J. BAILEY, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 73,283, dated January 14, 1868.

IMPROVEMENT IN AIR-CONDENSING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, H. J. BAILEY, of Pittsburg, in the county of Allegheny, and State of Pennsylvania, have invented a new and improved Air-Condenser; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved apparatus for condensing air for various purposes, but more particularly for forcing liquids; and the invention consists in an arrangement of vessels which communicate with each other by pipes or tubes, such communication being controlled by valves or cocks, which are operated by floats and governed by hydraulic pressure, whereby the apparatus is made automatic or self-acting, as will be hereinafter more fully described.

Figure 1 represents a horizontal section of this apparatus, showing the arrangement of the condensing-vessels, with the parts connected therewith.

Figures 2 and 3 are detailed views of parts which will be hereinafter referred to.

Figure 4 is a modification of the same device for condensing air, but arranged in a different manner.

Similar letters of reference indicate corresponding parts.

The important feature of my invention is making the apparatus act automatically by hydraulic pressure. For this purpose I force the air from two vessels by the rise of the water in them into another vessel, at the same time raising the floats and operating the cocks thereby, and opening the proper communication between the vessels.

A A', fig. 1, are two vessels, of suitable size and shape, which are identical in all their appointments, and which receive the water, and from which the air is expelled by the rise of the water in them. B is the receiver or vessel into which the air from the other vessels is discharged. C represents an eight-way valve or cock, and D is the lever by which the valve or cock is operated. Each of the vessels A A' has a cylinder, E E', and each cylinder has a piston, *a a'*, as seen in the drawing. *c c'* represent cocks, which are attached to the cylinders, and which are operated by floats, *d d'*. These cocks act alternately, opening and closing the communication between them, through the pipe *e*. The eight-way valve or cock is operated by the piston-rod *f*, which is attached to both the pistons *a a'*, as seen in the drawing. The lever D is connected with this piston-rod, as seen at *g*. As the pistons are acted upon alternately by the pressure, they are driven back and forth in their cylinders, and thus operate the valve or cock C, opening and closing the apertures as desired for the admission and discharge of the water and air. The operation of the floats in the vessels A A' is seen in the detailed views, figs. 2 and 3. H is the water-supply pipe. As seen in the drawing, the vessel A' is receiving water from this pipe through the valve or cock C and pipe H'. J is the water-pipe, which is, as seen, discharging water from the vessel A through the branch J' and pipe J'', while A' is filling with it. The water-pipes H' and J'' are connected with the two vessels near their bottoms, so that all, or nearly all, the water may be discharged therefrom when the communication is opened. K K' represent pipes which convey the compressed air from the vessels A A' to the valve C. These pipes are attached to the vessels A A' at their upper ends, and as the valve changes the position of the apertures, they are alternately brought in communication with the pipe L, which connects them with the receiver B. *m m* are air-supply pipes for the vessels A A'. O represents a check-valve in the pipe L, for the purpose of preventing back pressure. As before stated, communication being open, water is entering the vessel A', and being discharged from the vessel A. The float *d'* is being raised, and the air contained in A' is being compressed as the water rises, and is forced into the receiver through the pipes K' and L, as seen in the drawing. When the water raises the float *d'* to the position seen in fig. 3, communication will be opened between the two vessels A A', through the pipe *e* and cocks *c c'*, and the pressure of the water will force back the piston *a'*, and thereby operate the eight-way valve or cock through the lever D. By this change of the valve the operation is reversed in the two vessels: water will be discharged from A', while it will now enter A, and the former operation will be repeated.

It will thus be seen that the apparatus is automatic in its operation, and that the density of the air discharged into the receiving-vessel B will correspond with the head or amount of water-pressure employed. By closing the inner ends of the cylinders E E', and opening the proper communications, it is evident that the

pistons in these cylinders may be moved, and the valve C be operated by either water or air. And it will also be apparent that the arrangement described may be varied so as to use a three-way valve and a single cylinder, in which cylinder either air or water may be employed for operating the valve, substantially as represented in fig. 4. In both cases the apparatus would be self-acting or automatic in its operation. Another consideration, which has more particular reference to the economy of my apparatus, is most important, and that is, the air is condensed by hydraulic pressure, without any waste of water. The supply-pipe being connected with the "main," the water is let on by a cock, and passes through the apparatus as described, and is drawn off for use through the waste-pipe. It will be noticed that there is a discharge-pipe, P, on the receiver B, which pipe has a safety-valve, R, attached for regulating the pressure in the vessel; and also it has a cock in it regulating the discharge. Now, if it is desired to keep twenty-five pounds' pressure of air in the receiver, the safety-valve can be adjusted for it, so that in drawing the water for domestic use from the waste-cock, the apparatus would be set in motion, and a quantity of air would be compressed and discharged into the receiver corresponding with the quantity of water thus drawn off. If by thus drawing off the water the pressure should be raised above the given point, the safety-valve would rise and diminish the pressure.

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

1. The combination, with a vessel for receiving and retaining air under pressure, of two vessels for receiving air and water alternately, co-operative by means of cylinders, pistons, and pipes, for the purpose of condensing air, substantially as described.

2. In combination with the apparatus above named, I claim an eight-way cock or valve, and a three-way cock or valve, substantially as shown and described.

3. I claim a condensing-apparatus, to which air or water may be applied, for working the valves, and thereby rendering the operation of the same self-acting or automatic, in the manner described.

H. J. BAILEY.

Witnesses:

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