

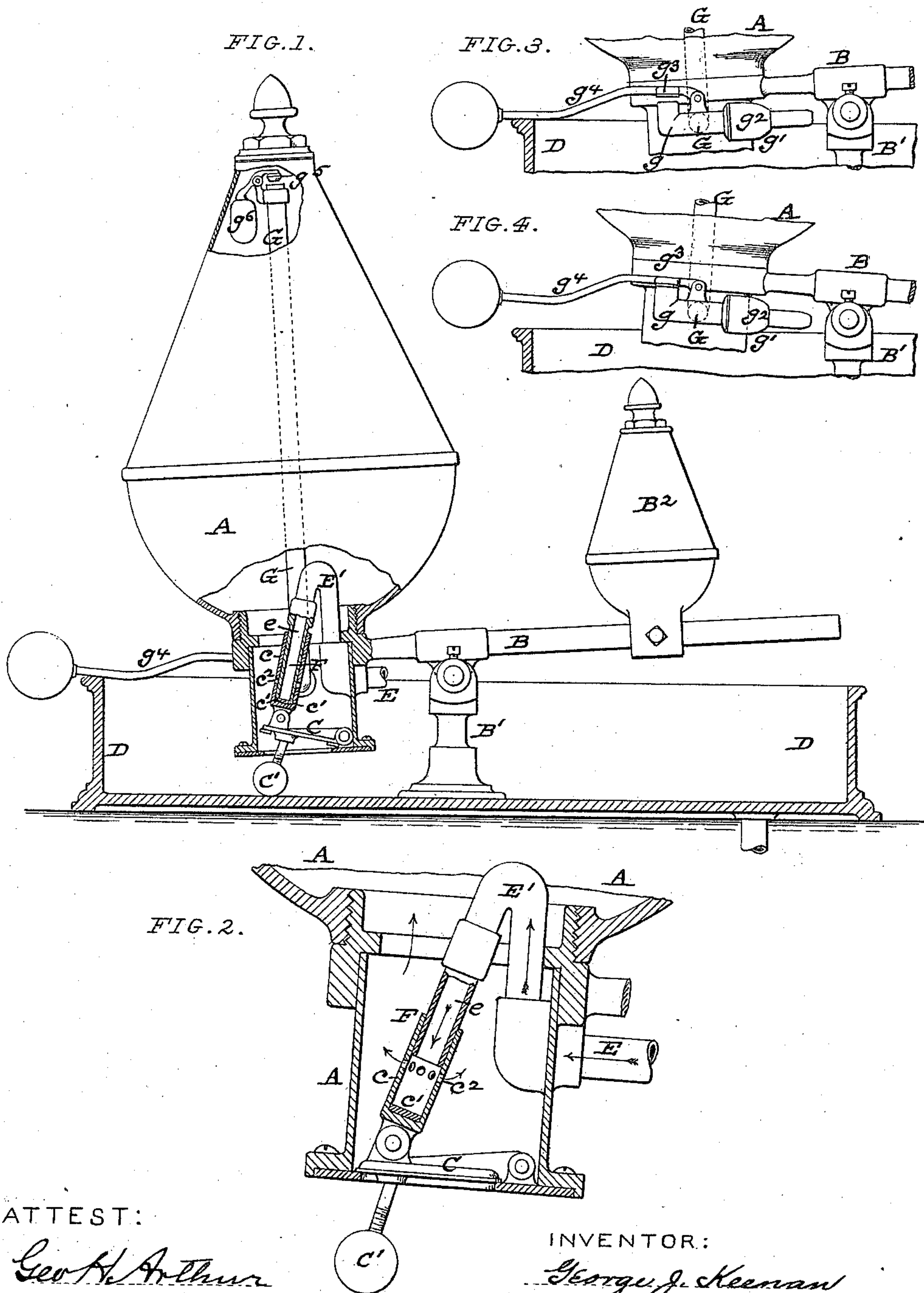
(No Model.)

G. J. KEENAN.

AUTOMATIC AIR PUMP OR COMPRESSOR.

No. 363,395.

Patented May 24, 1887.



ATTEST:

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AUTOMATIC AIR PUMP OR COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 363,395, dated May 24, 1887.

Application filed August 14, 1886. Serial No. 210,955. (No model.)

To all whom it may concern:

Be it known that I, GEORGE J. KEENAN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Air Pumps or Compressors; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to certain improvements in that class of automatically-operating hydraulic air compressors or pumps in which is employed a counterbalanced compression-chamber capable of a limited rocking motion in a vertical plane and provided with valved inlets and outlets for the air and water, the valves of which are automatically operated by the rocking motion of the compression-chamber; and the objects of the present invention are, first, to provide in connection with the present type of apparatus a simple, durable, and effective operating valve mechanism, which insures to a certainty the perfect reversals of the currents of air and water through the apparatus and the consequent perfect and automatic working of the apparatus to furnish the desired supply of compressed air; second, to provide means to prevent entrance of water into the egress air-pipe of the compression-chamber, and thus obviate the danger of the apparatus supplying water instead of compressed air; third, to afford an improved arrangement of parts whereby a single pipe within the compression-chamber is adapted to act as an inlet as well as an outlet for the air passing through the apparatus. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of an automatic air-compressor embodying my invention, the parts being shown in the position in which the air is taken into the compression-chamber and the body of contained water "wasting" therefrom; Fig. 2, an enlarged detail section of the foot and water-supply valves in a position opposite to that illustrated in Fig. 1; Fig. 3, a detail side view of the air-controlling valves in a "down" or

open position, and Fig. 4 a similar view of the same in an "up" or closed position.

Similar letters of reference indicate like parts in the several views.

As represented in the drawings, my improved air pump or compressor is provided with the usual compression-chamber, A, of any usual or suitable shape, secured to one end of a lever, B, the fulcrum of which is in the standard B', the counterbalance-weight B² being made adjustable, as usual, in order to regulate the action of the apparatus, and, when required, any suitable overbalancing device may be employed in connection with the apparatus to hold the chamber in its up or down position until completely filled or emptied of water, as the case may be.

At bottom the compressor-chamber A is provided with a foot-valve, C, preferably of the hinged or flap variety and of large area, as shown, so as to quickly empty the chamber when open. This valve is automatically operated to open as the chamber A is reaching its down position by a projecting toe, C', upon its under surface, which comes in contact with the base or bottom of the trough or tray D, over which the pump is arranged. Said tank or trough D is intended to receive the waste water from the pump and discharge it into a suitable outside receiver.

E is the water-inlet, ending in a goose-neck, E', in the interior of the chamber A. The free or open end *e* of this neck forms one member of the water-inlet valve F, which controls the ingress of water under pressure from the water-main or other source of supply that will provide the required pressure. The other member of the valve is formed by a sleeve, *c*, that surrounds and slides upon the member *e*, its lower end being provided with a packing-gasket, *c'*, to form a seat for the end of the member *e*.

*c*² shows outlet-openings in the sides of the member *c*, to admit the passage of water from the water-inlet E into the interior of the chamber A when the valve F is open. The member *c* is pivoted to the foot or outlet valve C, as shown, so as to be operated by the same, the arrangement being such that when the one is open the other will be closed, and vice versa, and thus obviate the danger of the supply and

waste being open at one and the same time. This form of valve F is specially applicable for the present use in that it furnishes a cheap and effective means within itself for insuring the complete closing of the valve C, as well as the complete opening of itself, as the members *e c* constitute a cylinder and piston, which are forced apart until the escape-orifices *c'* are unclosed, which is when the valve has reached its full opened position.

G is an air-pipe arranged within the compression-chamber A, open at top and extending from near the upper end of such chamber to near the lower end of the same, at which point it extends laterally outside of the walls of the chamber, and is provided with longitudinal valved branches *g g'*, the one *g* forming the inlet for air into the chamber A, the other, *g'*, forming an outlet for conducting away the compressed air from the chamber A.

The valve *g'* in the branch *g'* may be any usual form of check-valve that will prevent a backflow of the compressed air into the compression-chamber, while the valve *g* in the inlet branch *g* will be of the lever type, with the free end of its lever weighted and adapted to come in contact with the edge of the tray D in the initial descent of the compression-chamber A, (with which it moves,) to lift or open the valve *g* and admit air into the chamber A to vent the same.

It will be observed that by this construction the pipe or tube G is common to the air inlet and outlet of the compression-chamber A.

To prevent the chamber A from entirely filling with water and overflowing through tube G, I arrange at the top of the same a valve, *g'*, operated by a float, *g'*, to close the mouth of said tube when the water rises to near the top of the same, and thus prevent any liability of the water passing into the beer barrel or keg to spoil the contents of the same in cases where my improvement is used as a "beer-pump."

The operation of my improved apparatus is as follows, the parts being in the up position indicated in Figs. 2 and 4, with the water inlet-valve F open and the foot or waste valve C and air inlet-valve *g* closed: Water entering the chamber A through pipe E and valve F gradually displaces under pressure the air contained in the chamber and forces the same through valved branch pipe *g'* to the point of use, which action continues until the body of water in said chamber overbalances the counter-weight B², when the chamber A will descend to the position indicated in Figs. 1 and 3, and in its descent it will first cause the air-vent *g* to open by its valve-lever *g* coming against the edge of the tray D, and when near its complete descent the valve C will be opened by its projecting toe C' coming in contact with the bottom of the tray D. In its opening the valve C will automatically close the water-inlet valve F, to which it is connected, as hereinbefore described. The water is then free to

waste through the foot-valve C until the chamber is emptied and light enough to be again raised by the counterbalance-weight B² into its up or filling position for the above-described operation to be repeated, the valve F opening and the valves C and *g* closing during the upward movement of the chamber.

I am aware that prior to my invention it was not new to arrange the valves of air-compressors in the interior of the compression-chamber. I therefore do not claim such arrangement, broadly; but

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

1. In an air pump or compressor of the type herein described, the combination, with the compressing-chamber A, of the water-inlet valve F and water-outlet valve C, pivotally connected, as described, together and operating in unison, and located within the lower part of the interior of the chamber A, for the purpose set forth.

2. In an air pump or compressor of the type herein described, the combination, with the compressing-chamber A, of the water-inlet valve F, located within the lower part of the interior of the chamber A, composed of tubular members *e c*, adapted to slide together and provided with outlet-openings *c'* and gasket *c'*, the tubular member *c* being pivotally connected to the outlet-valve C and receiving motion therefrom, as and for the purpose set forth.

3. In an air pump or compressor of the type herein described, the combination of chamber A, water-inlet E, ending in a goose-neck, E', inside the chamber A, the hinged foot-valve C, and valve member *c*, pivoted thereto and adapted to slide upon the stationary valve member *c* of the goose-neck E', essentially as described, and for the purpose set forth.

4. In an air pump or compressor of the type herein described, the combination, with the chamber A, of the air-pipe G, valved branches *g g'*, weighted lever *g*, and tray D, the lever *g* extending over the edge of the tray, the parts being arranged and adapted to operate in the manner and for the purpose set forth.

5. In an air pump or compressor of the type herein described, the combination of a rocking counterbalanced compression-chamber, A, with the hinged and weighted foot-valve C, water-inlet valve F, connected thereto, located within the lower part of the interior of the chamber A, and air-pipe G, having branches *g g'*, valves *g g'*, operating-lever *g*, and tray D, the lever *g* extending over the edge of the tray, the parts being arranged to operate in the manner and for the purpose set forth.

In testimony whereof witness my hand, this 12th day of August, 1886, at Chicago, Cook county, Illinois.

GEORGE J. KEENAN.

In presence of—

GEO. H. ARTHUR,
ROBERT BURNS.