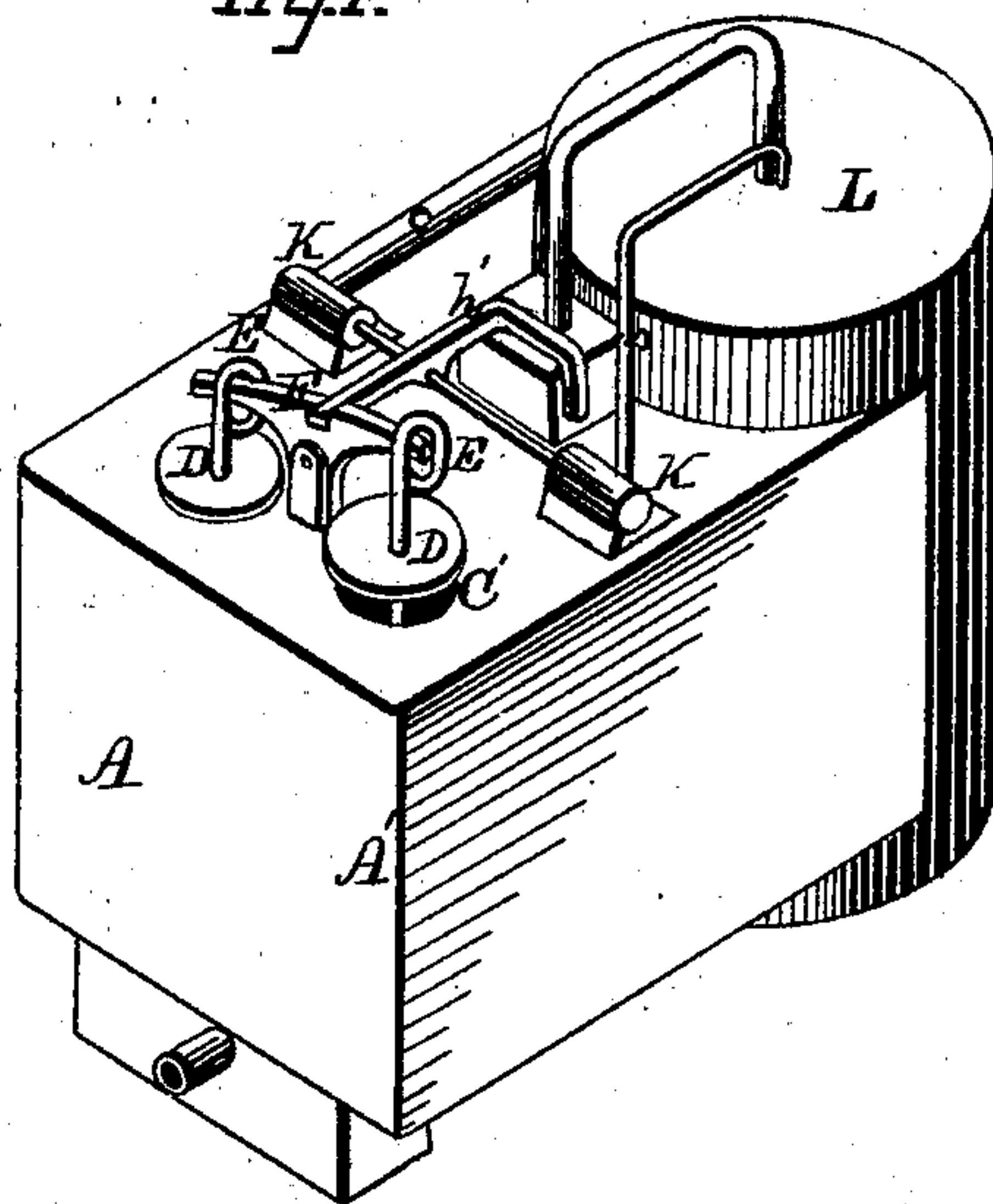


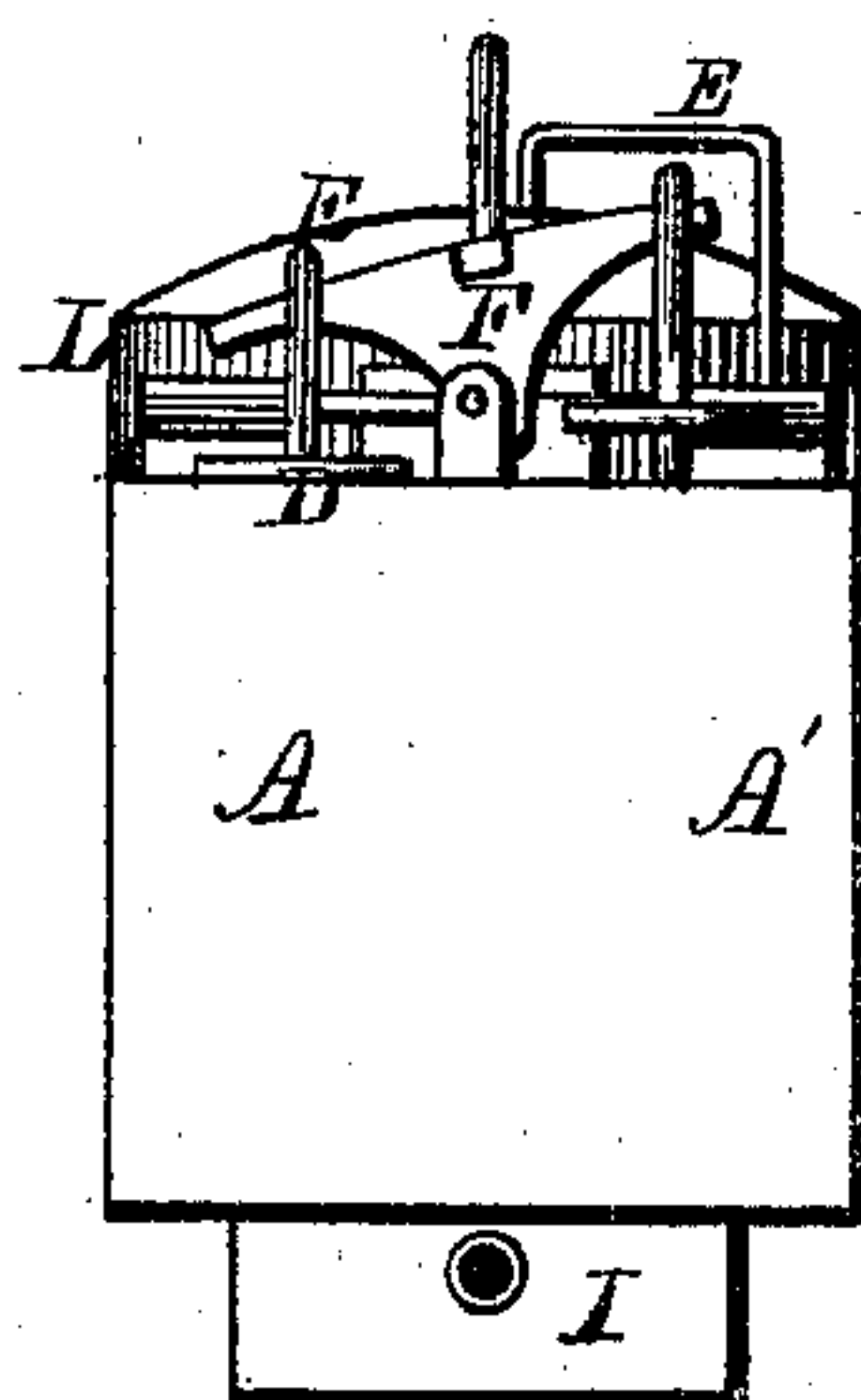
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**L. CHASE.**  
**Air-Compressors or Blowers.**  
No. 143,329. Patented September 30, 1873.

*Fig. 1.*



*Fig. 2.*



WITNESSES.

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 John R. Young*

INVENTOR.

*Lorenzo Chase, by  
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Fig. 3.

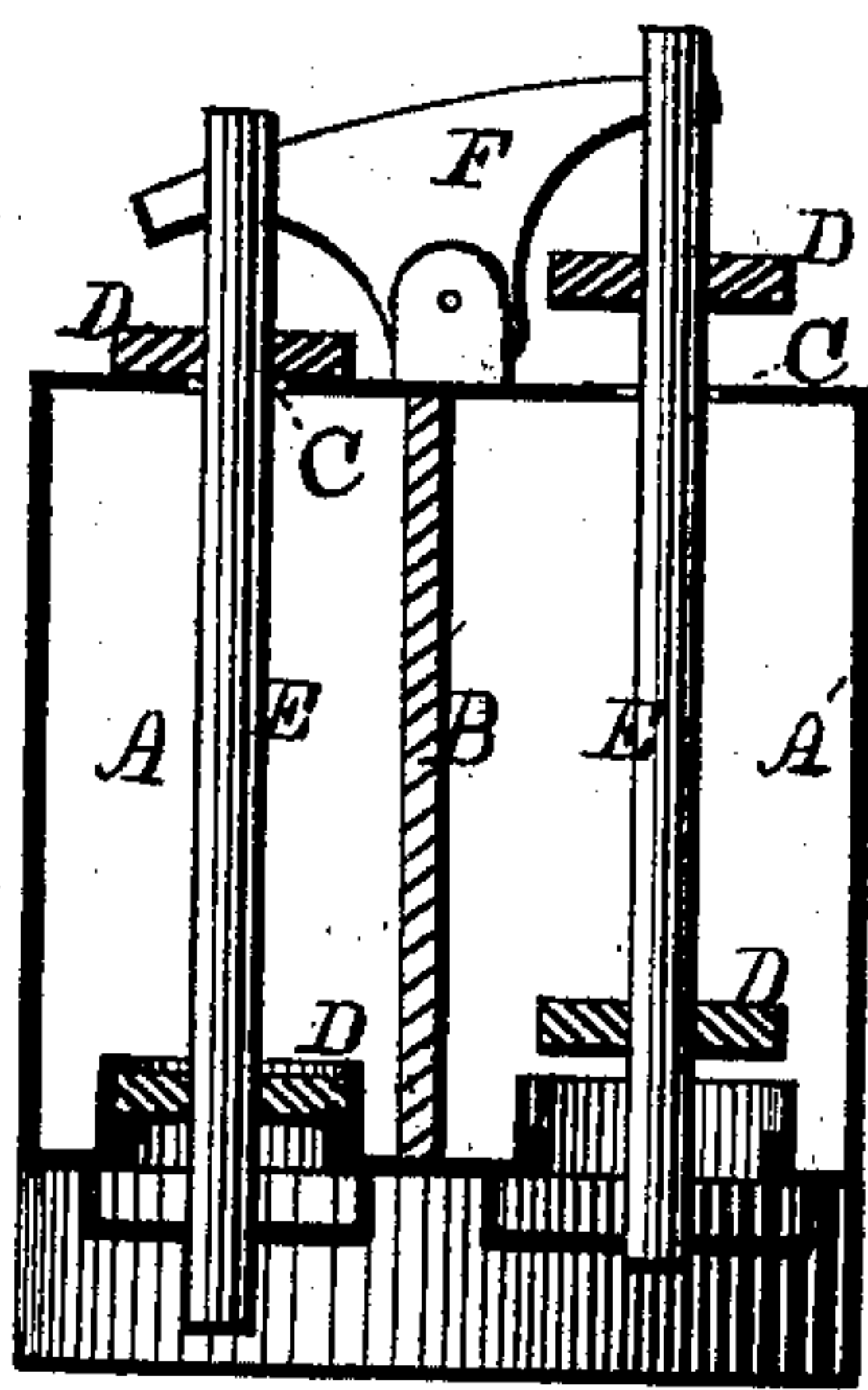
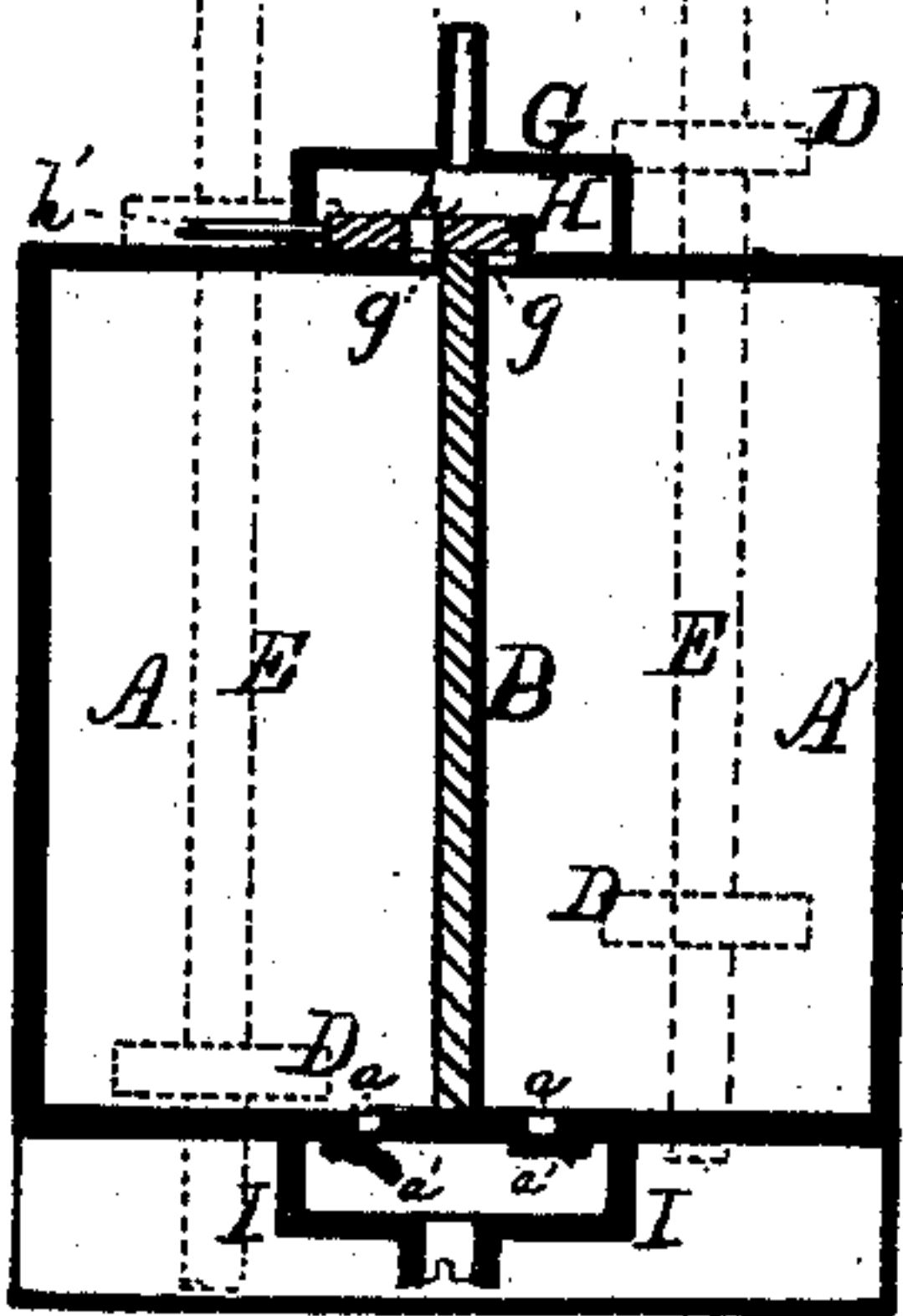


Fig. 4.



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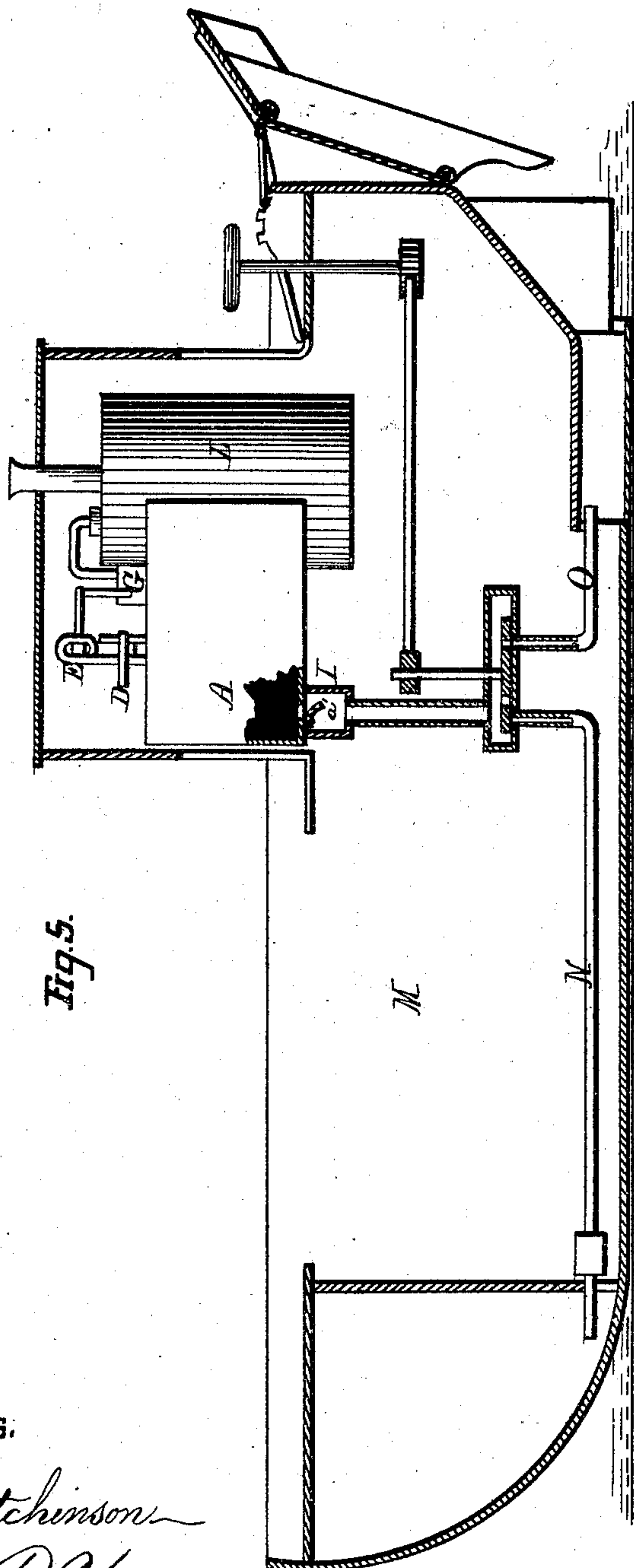


Fig. 5.

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# UNITED STATES PATENT OFFICE.

LORENZO CHASE, OF PORTLAND, MAINE, ASSIGNOR TO HIMSELF AND  
CHARLES W. CAHOON, OF SAME PLACE.

## IMPROVEMENT IN AIR-COMPRESSORS OR BLOWERS.

Specification forming part of Letters Patent No. 143,329, dated September 30, 1873; application filed  
February 29, 1872.

*To all whom it may concern:*

Be it known that I, LORENZO CHASE, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Air-Compressors or Blowers; and do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a perspective view of my apparatus as combined with the boiler. Fig. 2 is a front elevation of the same. Figs. 3 and 4 are vertical transverse sections upon lines extending, respectively, through the air-valves and through the steam-chest; and Fig. 5 is a central longitudinal section of a boat having my apparatus applied thereto as the propelling mechanism.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable air to be compressed with ease and economy, for the purpose of producing a blast for use, more especially, in the propulsion of boats; and it consists, principally, in the combination and relative arrangement of the air-chambers, air and steam valves, and the inlet and outlet ports, substantially as and for the purpose hereinafter shown. It consists, further, in the means employed for operating the air and steam valves, substantially as and for the purpose hereinafter set forth.

In the annexed drawings, A and A' represent two compartments or chambers, having, preferably, the same size and shape, which are placed side by side, and separated by means of a partition, B, as shown. Within the upper and lower ends of each compartment are provided air-openings C, that are inclosed by means of suitable puppet-valves, D, which valves are attached to or upon one rod or stem, E, so as to be simultaneously opened or closed. A rocker-shaft, F, journaled upon the upper side, and at the common center of the chambers or compartments A and A', has its ends loosely connected to or with the upper ends of the valve-rods E, and, when caused to oscillate upon or within its bearings, alternately opens and closes the valves, one set of said valves

remaining closed, while the other set are open. Upon the upper end and near the rear side of the compartments, at their common center, is placed a valve-chest, G, which, at its upper side, communicates with a steam-boiler, and incloses two steam-ports, *g*, one of which enters each compartment near the partition B. A slide-valve, H, provided with one central port, *h*, is caused to travel to and fro within the steam-chest G, so as to simultaneously cover one port, *g*, and to cause its said port *h* to coincide with the opposite port *g*, so as to alternately admit and exclude steam from the compartments A and A'. At the lower end and near the front side of each compartment is provided an opening or port, *a*, which communicates with a chamber or reservoir, I, placed beneath, and is closed by means of an ordinary clack-valve, *a'*, which opens downward.

It will be seen that, if steam be now admitted to one of the chambers while its puppet or induction valves are closed, the air within said chamber will be expelled through its induction-valve *a'* into the reservoir I, after which, by changing the course of the steam so as to cause it to enter the second chamber, and at the same time reversing the positions of the induction air-valves, the air within the said second chamber will be expelled, as before described, while the first chamber operated upon will be supplied with fresh air, which will enter through its open induction-ports, the operations of alternately filling and discharging said chambers causing a constant supply of air, having a substantially uniform pressure, to be maintained within the reservoir.

In order that the steam-port of each air-chamber may be opened at the instant that its air-induction ports are closed, the valve-rod *h'* of the slide-valve H is connected to or with the rocker-shaft F in such a manner as to be moved by the operation of said shaft, while the whole of said mechanism is operated by means of a small steam-engine, K, which is placed upon the upper end of one of the chambers, and is suitably connected to or with said parts.

The air-compressing apparatus is, preferably, secured directly upon the side of a steam-boiler, L, so as to render the mechanism more compact; but no necessity exists for such



arrangement should convenience require a change.

The apparatus described may be usefully employed wherever compressed air is required; but it is intended for use more especially for the propulsion of boats, in which event said apparatus is arranged within the boat M, as shown in Fig. 5, and the compressed air conveyed, by means of suitable pipes N and O, to the stern and bow, respectively, and permitted to escape below the water-line, where, by its buoyancy, it passes upward and outward along the inclined plane formed by the boat's bottom and sides, and moves said boat in a direction opposite to that of said air.

The apparatus thus constructed is simple, efficient, and durable, and can be furnished and operated at a comparatively small expense.

Having thus fully set forth the nature and

merits of my invention, what I claim as new is—

1. The combination and relative arrangement of the air-chambers A and A', the air induction and eduction ports C and *a*, respectively, the air-valves D and *a'*, the steam-valve H and *h*, and the steam-ports *g*, substantially as and for the purpose shown.

2. In an air-compressor, substantially as described, the combination of the puppet-valve stems E, slide-valve stem *h'*, and the rocker-shaft F, substantially as and for the purpose specified.

In testimony whereof I hereunto set my hand this 27th day of February, 1872.

LORENZO CHASE.

Witnesses:

CHAS. W. CAHOON,  
F. E. JORDAN.