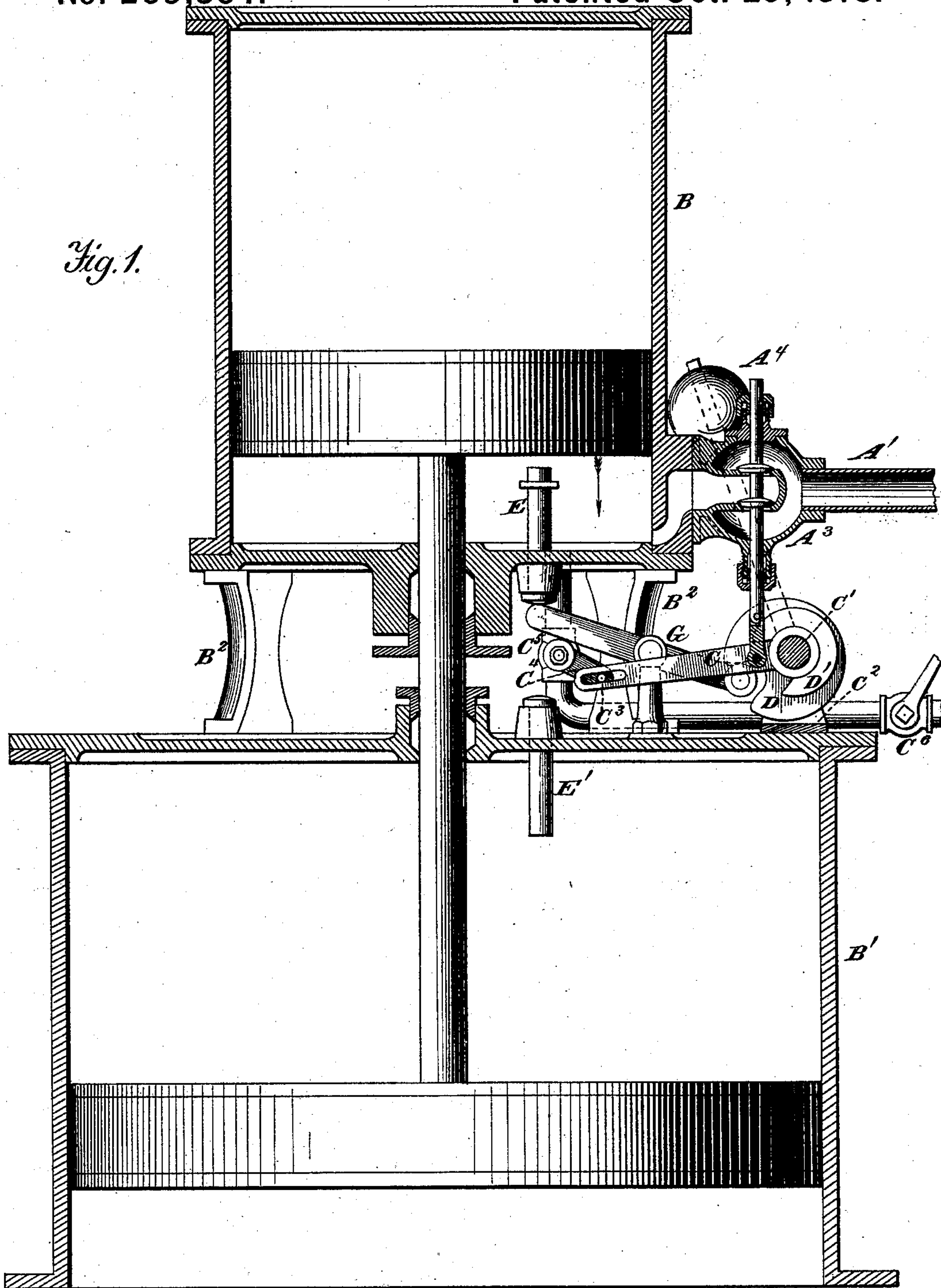


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Fog-Horn.

No. 209,364.

Patented Oct. 29, 1878.

Fig. 1.



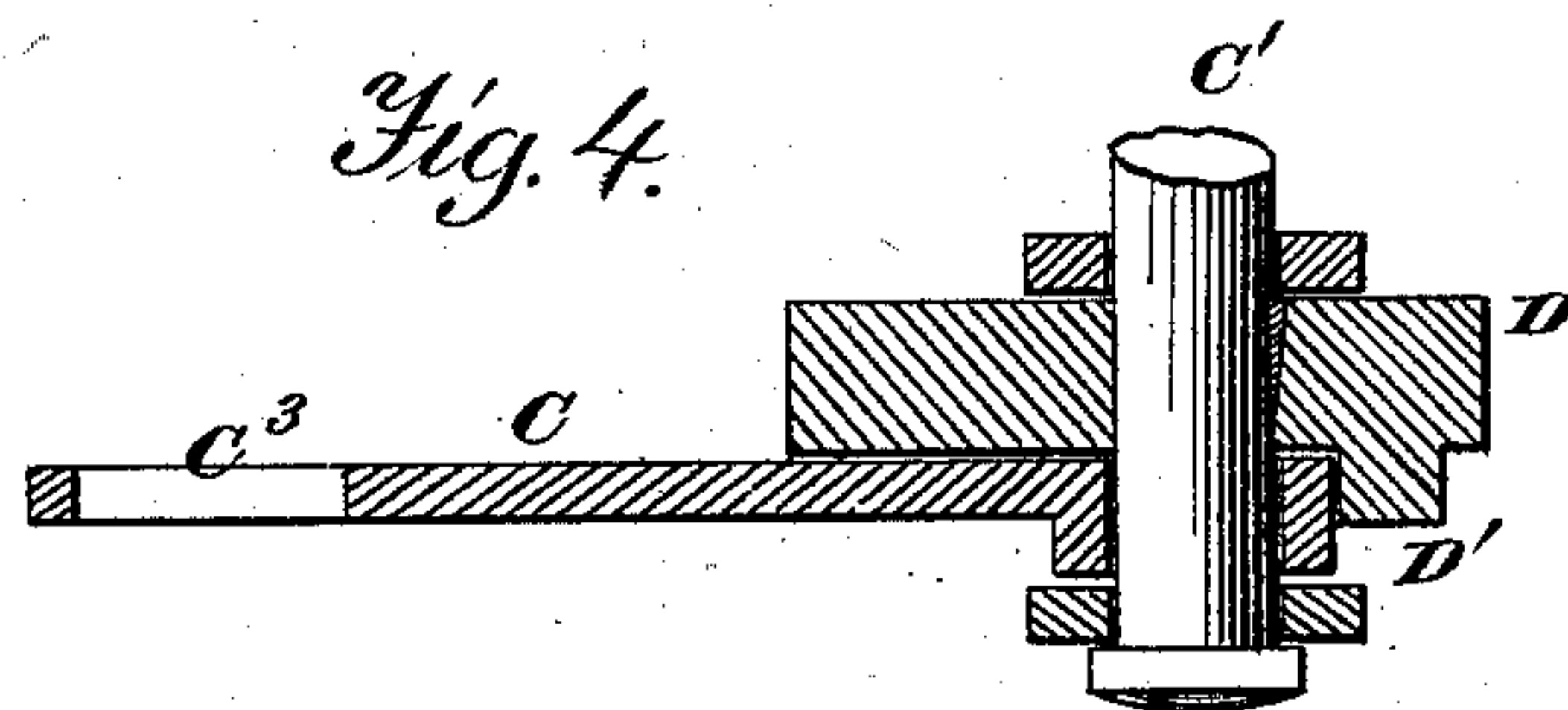
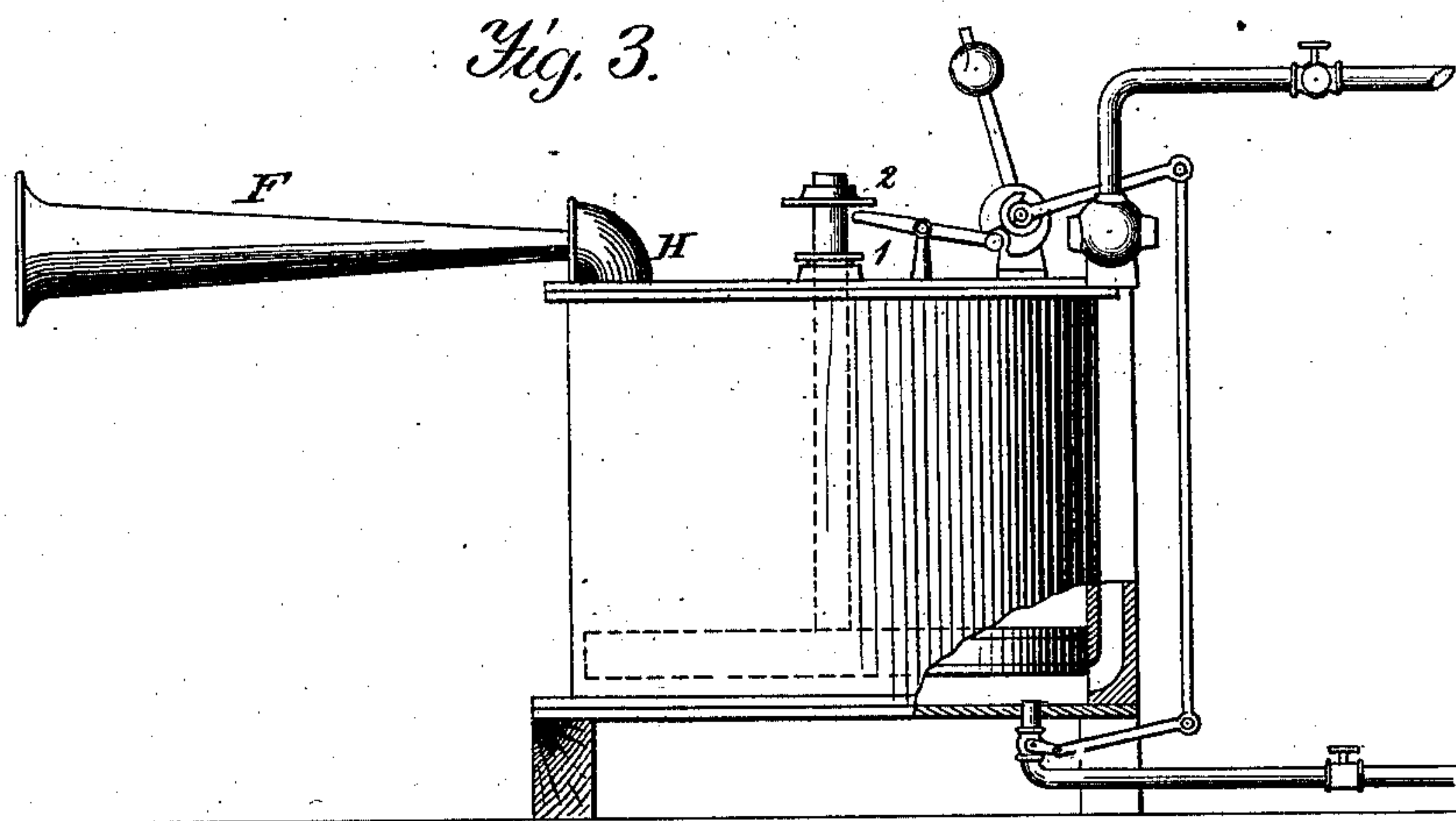
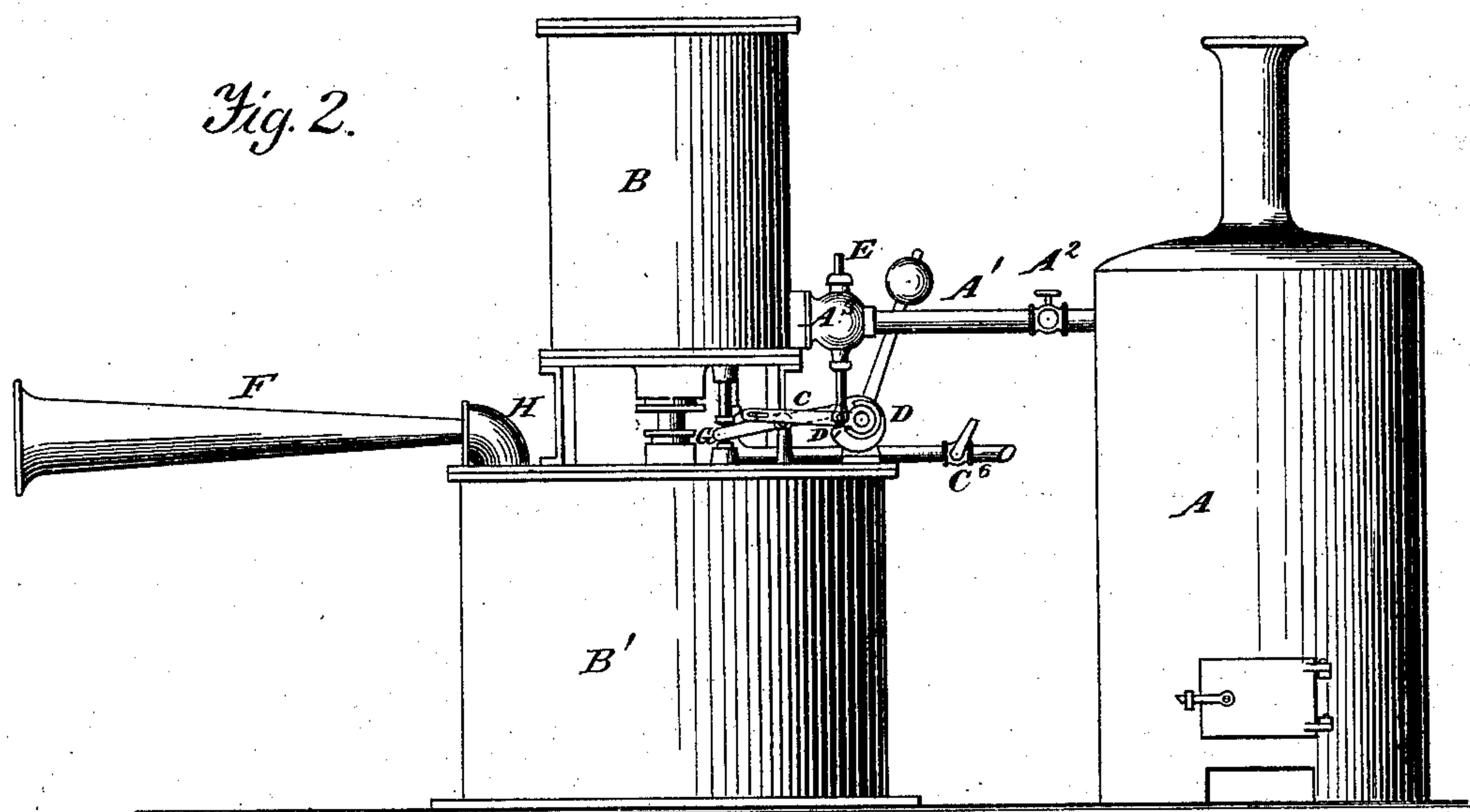
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UNITED STATES PATENT OFFICE.

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BY MESNE ASSIGNMENT, TO NEPTUNE FOG HORN COMPANY, (LIMITED),
OF QUEBEC, CANADA.

IMPROVEMENT IN FOG-HORNS.

Specification forming part of Letters Patent No. **209,364**, dated October 29, 1878; application filed
June 19, 1878.

To all whom it may concern:

Be it known that we, LEWIS SMITH and ROBERT BOOTH, of Sherbrooke, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Fog-Alarms; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification—

Figure 1 being a sectional elevation of our improved apparatus, showing an air-cylinder, a steam-cylinder—the pistons of the two being united to one rod—the steam induction and eduction valves, the valve-moving mechanism, and the pipes for conducting the steam to and from the cylinder. Fig. 2 is an elevation of the apparatus, showing also a steam-generator and a horn attached to the air-cylinder for sounding the alarm. Fig. 3 is a modification of apparatus, showing how one cylinder may be used for both steam and air, and showing also a modified arrangement of the valve-operating mechanism; and Fig. 4 is a sectional detail view of a portion of the valve-operating devices.

Corresponding letters denote like parts in all of the figures.

This invention relates to that kind of apparatus which is termed a “fog-alarm,” and is designed to be used upon the shores of lakes, rivers, and other bodies of water, or upon structures erected in such waters for the purpose of sounding an alarm in foggy weather, or in the night, for the purpose of notifying vessels of their approach to dangerous positions; and it consists in the construction, combination, and arrangement of certain of the parts of which it is composed, as will be more fully described hereinafter.

In constructing an apparatus of this type, we use any suitable steam-generator, A, which has extending from it a pipe, A¹, which is supplied with a throttle-valve, A², and an induction-valve, A³. At any suitable distance from the generator A there is placed a steam-cylin-

der, B, and an air-cylinder, B¹, or it may be a cylinder in which both steam and air are used.

In arranging these cylinders—when more than one are used—we prefer to place the steam-cylinder B directly above the air-cylinder, and to unite the two with suitable brackets B² B², so as to hold them firmly in their relative positions.

It will be observed that the steam-cylinder B is smaller in diameter than the one in which air is used. This is rather a matter of convenience than of necessity, as it is clear that both may be of the same diameter, if desired, both being of the same length, or nearly so.

In order that this apparatus may be automatic in its operation, there is placed in the pipe which connects it to the steam-generator an induction-valve, A³, which, by preference, is of the balanced form shown in the drawings, but which may be of any other suitable form. This valve is supplied with a rod, A⁴, to which the disks which control the flow of steam are secured. This rod passes through the case of the valve, and from thence downward to an arm, C, to which it is connected in such a manner that it will rise and fall as the outer end of said arm is raised or lowered. This arm is placed upon a shaft, C¹, which is fixed in a bracket, C², attached to the upper head of the air-cylinder. Upon this shaft the arm moves freely and has a partial rotative movement, its outer or free end being provided with a slot, C³, in which works a crank-pin attached to a crank, C⁴, connected to a spindle of the eduction-valve C⁵, which is located in a pipe attached to the lower head of the steam-cylinder, said pipe being supplied with an additional valve, C⁶, which, by being more or less opened, will regulate the movements of the pistons in descending, as if this last-named valve is only slightly opened, the pistons will descend slowly, even when the valve C⁵ is full open.

The movements of the arm C are caused and regulated by a disk, D, secured upon the shaft C¹, and which partially rotates therewith, it having upon one of its sides a projecting flange, D¹, a portion of which is cut away, as shown in Fig. 1, so as to allow it to move some

distance without coming in contact with the arm C, but so as to finally cause it to move said arm to such an extent as to operate the induction and eduction valves.

For giving an automatic movement to the parts just described, and so to the pistons of the apparatus, there is placed in the inner heads of the respective cylinders a movable rod, with the inner end of which the pistons come in contact in rising and falling. These rods are lettered E and E', E being placed in the lower head of the steam-cylinder, and E' in the upper head of the air-cylinder.

It will be observed that, as represented in Fig. 1, the pistons are descending, at which time the valves C⁵ and C⁶ are supposed to be open to such an extent as to allow the steam to pass out as rapidly as is desired, and at which time air will be flowing into the air-cylinder through the horn or trumpet F, (shown in Fig. 2,) a similar one being used when the apparatus is arranged as shown in Fig. 1.

It will also be observed that, as shown in Fig. 1, the piston in the steam-cylinder is about to come in contact with the rod E, which is there shown as elevated, and with its lower end resting upon a lever, G. As the eduction-valves are at this time open, it follows that the pistons will continue to descend until the one in the steam-cylinder comes in contact with rod E, when it will be carried down with the piston, in doing which it will press upon and move downward that end of the lever G upon which it rests, the effect of which will be that it will cause its opposite end to rise. That end being fitted in a recess formed in the disk D, as shown in Fig. 1, causes said disk to partially rotate, in doing which it brings the flange D' in contact with arm C, and causes it to open the induction-valve A³ and close the eduction-valve C⁵, when steam will enter the cylinder B below its piston, and said piston will be raised, in doing which the piston in the air-cylinder will come in contact with the end of lever G, and return it and the parts operated thereby to their normal positions, and thus the apparatus will continue to operate automatically as long as steam is generated in the boiler, the descent of the pistons being caused by their own gravity and that of the rod to which they are connected, the rapidity of their downward movement, and, consequently, the frequency of the alarms, being regulated by the throttle-valve A² and the escape-valve C⁶. To insure the full movement of the arm C, and, consequently, the opening and closing of the valves, there is attached to the shaft C¹ an arm, which carries upon its outer end a weight, which is so arranged that when by the action of lever G said shaft has been so far rotated as to carry the weight past a vertical line in either direction, its momentum and its weight will combine to carry the shaft into such a position as to insure the opening of the valves, and it will also hold the valves in their adjusted positions until

they are again shifted by the movements of the pistons.

For giving the required sound or alarm there is placed upon the air-cylinder a chamber, H, which contains a reed of any desired form, that will be vibrated by the passage of the air from the air-cylinder as its piston is raised; and in order that the sounds caused by the vibrations of said reed may be intensified or increased in volume, there is attached to the chamber H a horn or trumpet, F, the form and dimensions of which should be varied to suit the circumstances under which it is to be used, and should have its enlarged end pointed in the direction in which it is desired to have the sound travel. The air to the cylinder may be admitted through this horn and reed-chamber as the pistons descend, or it may be admitted through a valve placed in the head or other part of the air-cylinder, or through both, if desired.

The device shown in Fig. 3, as above stated, is a modification of the one already described, such modification being designed to adapt the apparatus for use by the employment of a single cylinder, in which case substantially the same valves and valve-moving mechanism are used as are described, the only difference being that the parts are differently arranged, and they are operated by disks or collars 1 and 2 placed upon the piston-rod and outside of the cylinder, steam being admitted below the piston to carry it up, and thus force out the air that was drawn in on its downward stroke, it having been carried down by gravity, as in the first-described case.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a fog-alarm apparatus, the combination of a steam-generator, a steam-cylinder, and an air-cylinder, having in them pistons which are raised by the force of steam admitted to the under side of the piston of the steam-cylinder, and which fall by their own gravity, substantially as described.

2. In a fog-alarm apparatus, the combination of the steam-cylinder B, air-cylinder B¹, rods E E', and an automatically-operating valve mechanism consisting of the lever G, disk D, arm C, and rod A⁴, the parts being arranged to operate substantially as and for the purpose set forth.

3. In a fog-alarm apparatus, the combination of the rods E E', operated by the pistons of the cylinders B and B¹, and the valve-operating lever G, when constructed and operating substantially as set forth.

4. In a fog-alarm apparatus, the combination of the steam-induction pipe A¹, induction-valve A³, arm C, and eduction-valve C⁵, the parts being arranged with reference to each other, substantially as set forth.

5. In combination with the eduction-pipe of a fog-alarm apparatus, an eduction-valve for allowing the steam to pass from the cylinder,

and a cock or valve for regulating the passage of steam in such a manner as to control the downward movement of the pistons in the cylinders thereof, substantially as set forth.

6. In a fog-alarm apparatus, the combination of the cylinders B and B¹ and their respective pistons, they being arranged with reference to each other, as described, whereby the piston of the air-cylinder is made to force air through a trumpet or horn provided with a suitable vibrating reed, and thus cause an intermittent alarm to be given, and whereby

the piston of the steam-cylinder is made to move the induction-valve into its open position, and the piston of the air-chamber is made to close the same, substantially as described.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

LEWIS SMITH.
ROBT. BOOTH.

Witnesses:

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LAWRENCE J. M. HOLLAND.