

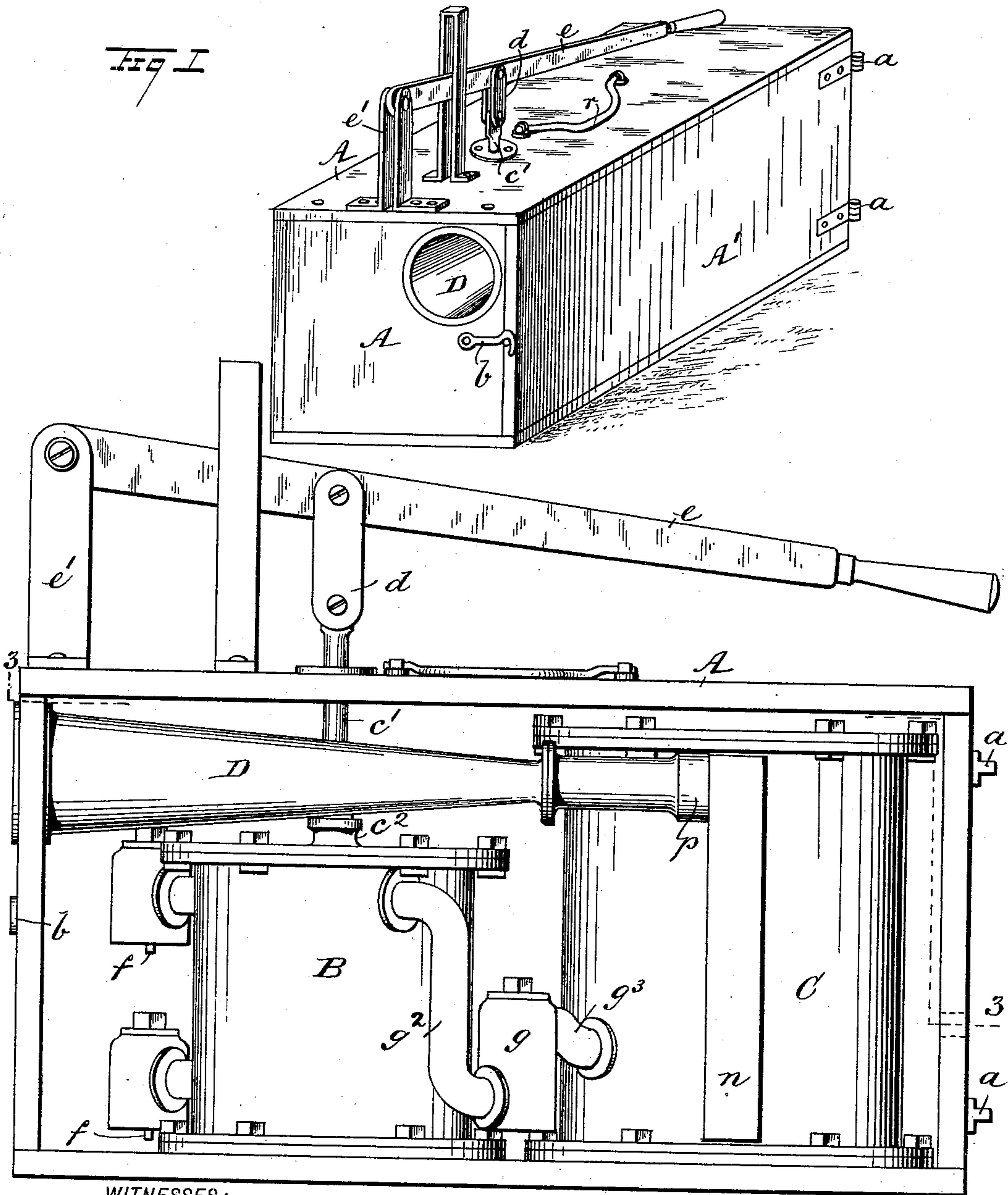
(No Model.)

2 Sheets—Sheet 1.

J. MILLBOURN.
PORTABLE FOG HORN.

No. 435,363.

Patented Aug. 26, 1890.



WITNESSES:

H. Walker
C. Bedgwick

INVENTOR:

J. Millbourn
BY Munn & Co.

ATTORNEYS

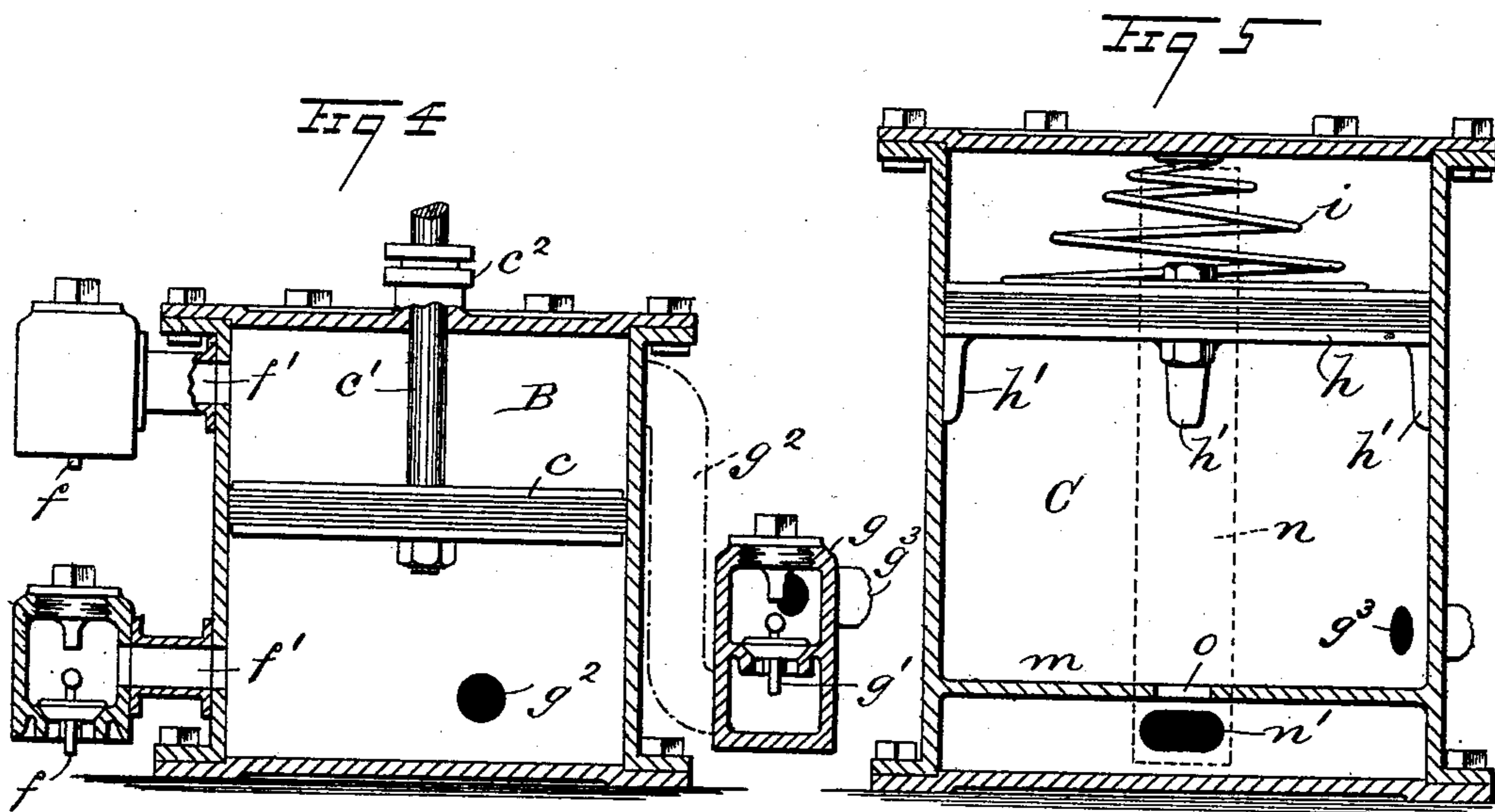
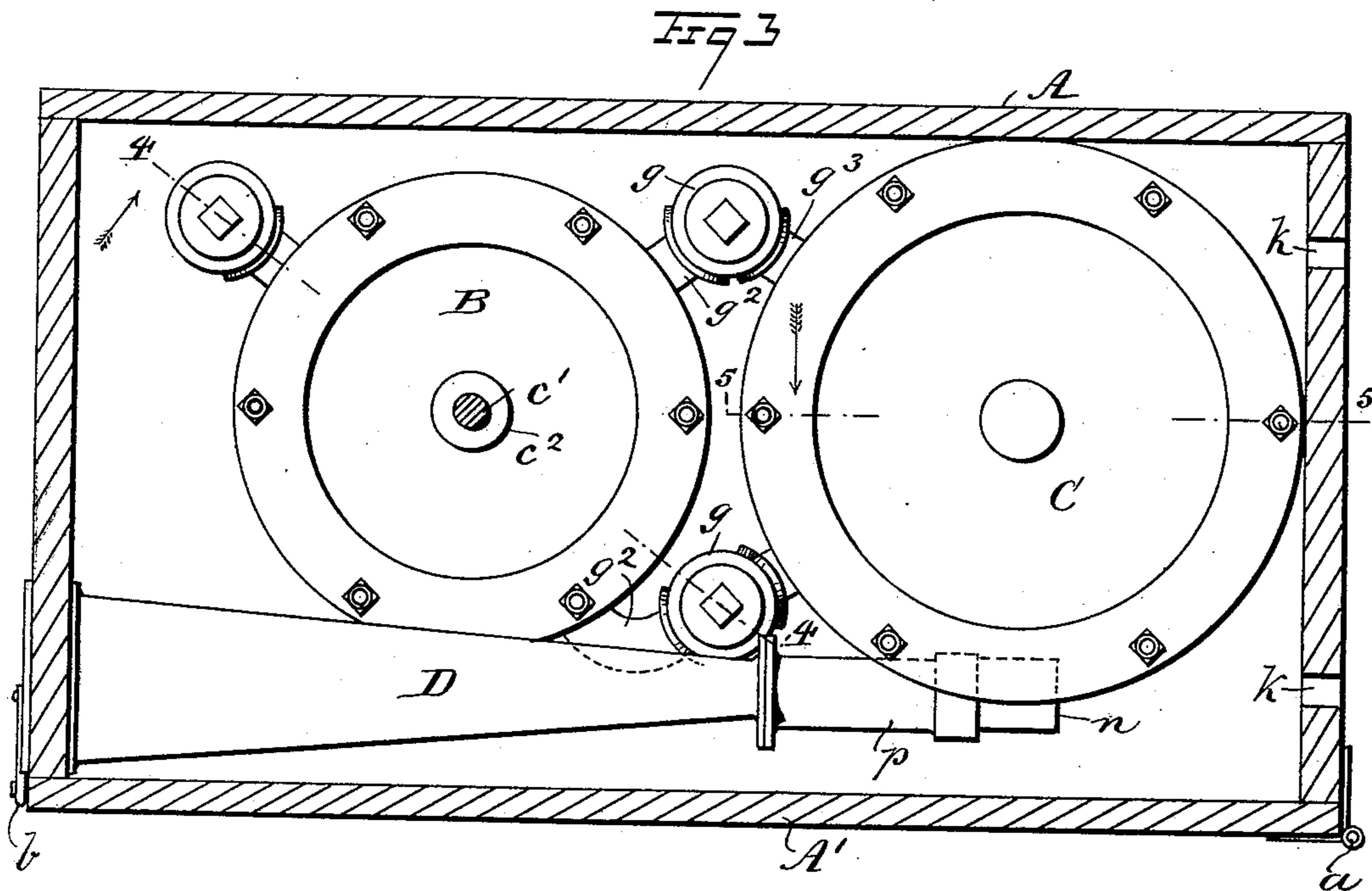
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UNITED STATES PATENT OFFICE.

JAMES MILLBOURN, OF NEW YORK, N. Y., ASSIGNOR TO CLEMENT GOULD,
OF SAME PLACE.

PORTABLE FOG-HORN.

SPECIFICATION forming part of Letters Patent No. 435,363, dated August 26, 1890.

Application filed April 16, 1890. Serial No. 348,251. (No model.)

To all whom it may concern:

Be it known that I, JAMES MILLBOURN, of the city, county, and State of New York, have invented a new and useful Portable Mechanical Fog-Horn, of which the following is a full, clear, and exact description.

My invention relates to an improved fog-horn which is operated mechanically, and has for its object to provide a simple portable device which may be manipulated to produce a continuous signal by blowing a long blast upon a horn, or a series of independent signals, as may be desired.

To this end my invention consists in the construction and combination of parts, as is hereinafter described, and indicated in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the device. Fig. 2 is a side elevation of the same with one side of the casing removed to expose interior parts. Fig. 3 is a sectional plan view taken on the line 3 3 in Fig. 2. Fig. 4 is a sectional elevation of the air-pump taken on the line 4 4 in Fig. 3; and Fig. 5 is a sectional elevation of the air-receiving chamber, taken on the line 5 5 in Fig. 3.

A rectangular case A is provided for the device, wherein the operating mechanism is located, one side A' being hinged at *a* to the end of the case, thus affording a door, which may be secured by a latch *b* or other preferred means.

Near the forward end of case A a vertical cylinder B of a double-acting air-pump is located, the piston *c* of which is packed in any preferred manner to work smoothly in the cylinder, its rod *c'* extending upwardly outside of the case A through the stuffing-box *c²*, whereby a tight joint is afforded. The pump-rod *c'* is flattened into a stud end at its upper terminal for pivotal engagement with the links *d*, that are also pivoted at their upper ends to the horizontal lever *e*, which is fulcrumed at one end to the upright bracket-posts *e'*, the free end of the lever being provided with a handle, whereby it may be vi-

brated and the piston *c* reciprocated in the cylinder.

Upon the front side of the air-pump cylinder B, near one corner of the case A, two air-inlet valves *f* are attached by connection of their cages and branched necks upon the side of the cylinder, as shown in Fig. 4, one valve being located near the lower head of the air-pump cylinder to introduce air below the piston and the other above said piston, both valves being of ordinary construction and alike.

On the side of the air-pump cylinder B which is opposite the inlet-valve connections to the same the cages *g* of the air-discharge valves *g'* are located. These are similar in form to the inlet-valves *f*, as shown in Fig. 4, but their arrangement differs therefrom in that the attachment of the branch pipes *g²*, extending from the air-pump to the valve-cages *g*, enter said cages below the valve-seats in the same, while on the inlet-valve cages the branch pipes enter the same above the valve-seats, as shown at *f'*. One of the branch pipes *g²* communicates with the air-pump cylinder B above the piston *c* and the other one below said piston, so that the reciprocation of the piston will alternately open one inlet-valve and close the other, and in like manner operate the discharge-valves to forcibly expel inducted air and transfer it to another chamber, next to be described.

The air-receiving chamber C is secured in place between the rear end wall of the case A and the air-pump cylinder B, said chamber being, preferably, made cylindrical and of suitable dimensions that should exceed the capacity of the pump-cylinder, removable tight-jointed lids being attached to each end of the upright chamber.

Within the air-receiving chamber C a pressure-equalizer head or movable partition *h* is placed, which is made to fit loosely against the inner surface of the chamber-wall, and is properly packed to produce an air-tight joint between the head and wall. The equalizer-head *h* may rest upon the spaced ears or stops *h'*, which limit its depression, and upon the upper side of said head *h* a cone-spring *i* is placed, which has forcible contact with the

upper lid of the chamber, and thus holds the head on its supports h' , exerting a tensional force sufficient to depress the head h and maintain a certain degree of pressure thereon, 5 as will be further explained.

At a proper distance above the lower lid of the chamber C a diaphragm-wall m is formed or introduced and secured parallel to said lid, and upon the outside of the chamber an air 10 flue or conduit n is attached by its adjacent surface, there being an intersecting aperture n' cut through the walls of the chamber C and the conduit at a point which will tap the sub-chamber below the diaphragm m , said diaphragm-wall being apertured at o near its center, thus establishing an air-passage between 15 the space in the chamber C above the diaphragm and the sub-chamber below it.

At the upper end of the air-conduit n the 20 fog-horn D is attached, which is extended horizontally to and through the forward end of the case A to permit egress of sounds produced at the air-receiving end p of the horn, the usual vibrating tongue or sound-producer 25 being therein located, which, being of well-known form, is not shown.

From the outlet-valve cages g branch pipes g^3 are extended, which connect at opposite 30 points with the wall of the air-receiving chamber C, whereby the operation of the pump-piston will be adapted to introduce a steady current of air within the cavity above the diaphragm m , a free supply of air entering the case A at k , where holes are made in the 35 wall of said case.

In operation the rapid vibration of the hand-lever e will fill the chamber C above the diaphragm-wall m and cause the pressure-equalizer head h to move upwardly from its position on the supporting-ears h' , the air at the 40 same time penetrating the sub-chamber below the diaphragm m enters the conduit n , and thence escapes with graduated force into the horn D.

By reason of the proportionate dimensions 45 given to the aperture o and outlet-orifice n' in the conduit n the air-pressure is graded, and a powerful blast may be blown continuously while the hand-lever e is being moved 50 and for a short time after vibration of the same is suspended, successive blasts at proper intervals being readily produced by a proper manipulation of the hand-lever.

As the entire device is portable and a han-

dle r is provided for its convenient transportation manually, signalling can be effected 55 from any desired point on a sea-going vessel, shore station, or small boat afloat on the water, which will prove a valuable aid to navigation during the prevalence of dense fogs, 60 when sound-signals alone are available for warnings as to the course of the craft and directions to others to avoid crossing the same within dangerous limits.

Having thus described my invention, I claim 65 as new and desire to secure by Letters Patent—

1. In a portable fog-horn, the combination, with an outer inclosing-casing, of an air-pump 70 mounted therein, air inlet and outlet valves fitted within the casing in cages external to the pump and communicating therewith, a lever fulcrumed on the outer side of the casing and coupled with the piston of the pump, an air-receiving chamber communicating with 75 the pump, a spring-actuated movable partition having limited play in one end of the air-receiving chamber, and a fog-horn communicating with said chamber, substantially in the manner and for the purpose herein set forth. 80

2. In a portable fog-horn, the combination, with the shell of the air-receiving chamber 85 connected with the air-pump, of a head movable vertically in the upper portion of the shell, a spring-bearing between the lid of the air-chamber and the upper side of said movable head, and a transverse diaphragm-wall secured in the lower portion of the shell and providing a sub-chamber in communication 90 with the main air-chamber, substantially as set forth.

3. In a portable fog-horn, the combination, with a casing and an air-pump in said casing, of an air-receiving and air-discharging chamber having a transverse perforated diaphragm- 95 wall near its bottom providing a sub-chamber, an air-conduit pipe on the outside of the air-chamber communicating at its lower end with the sub-chamber, an equalizer-head movable vertically in the upper portion of the air- 100 chamber, and a spring-bearing between said movable head and the lid of said main air-chamber, substantially as set forth.

JAMES MILLBOURN.

Witnesses:

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REUBEN A. BRIGGS.