J. P. NORTHEY.

SOUND PRODUCING DEVICE.

APPLICATION FILED JUNE 5, 1908.

976,682. **Patented Nov. 22, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.

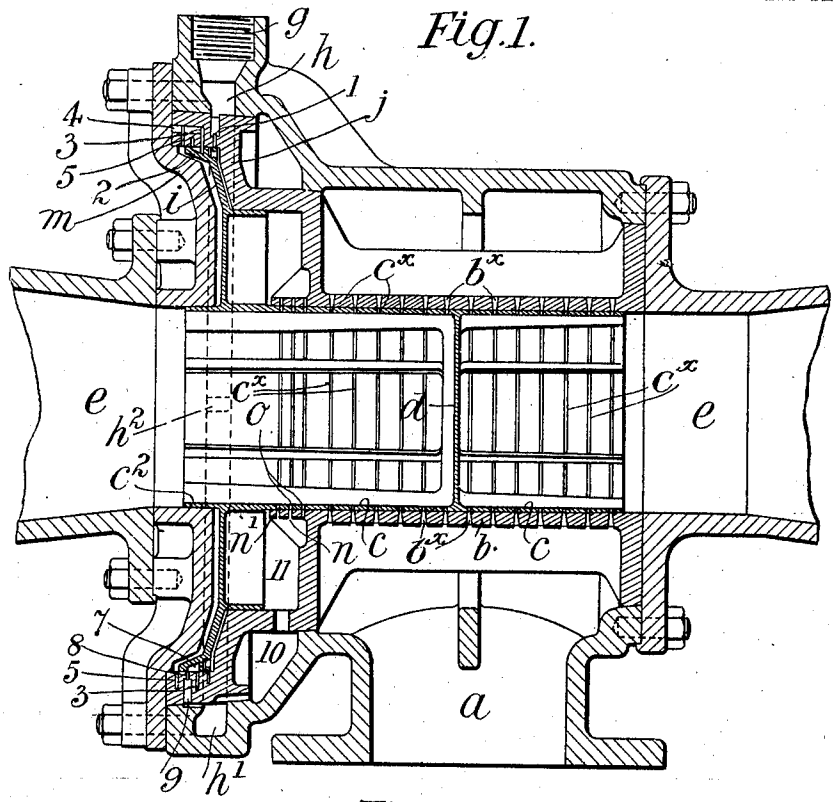
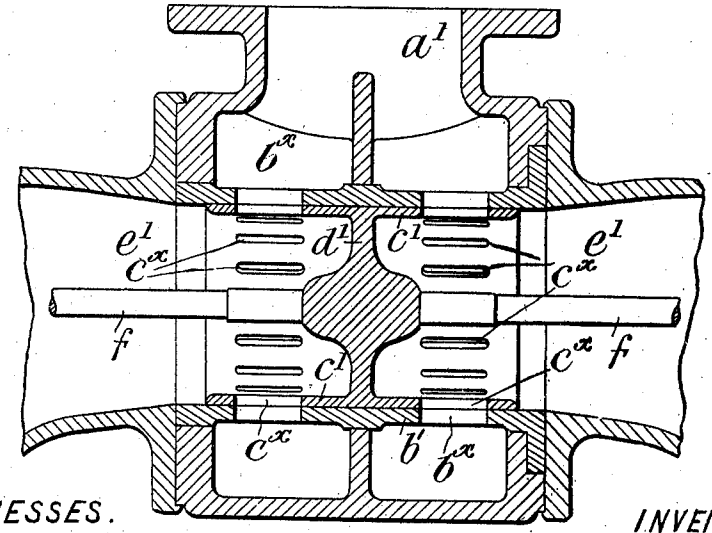


Fig. 2.



WITNESSES.

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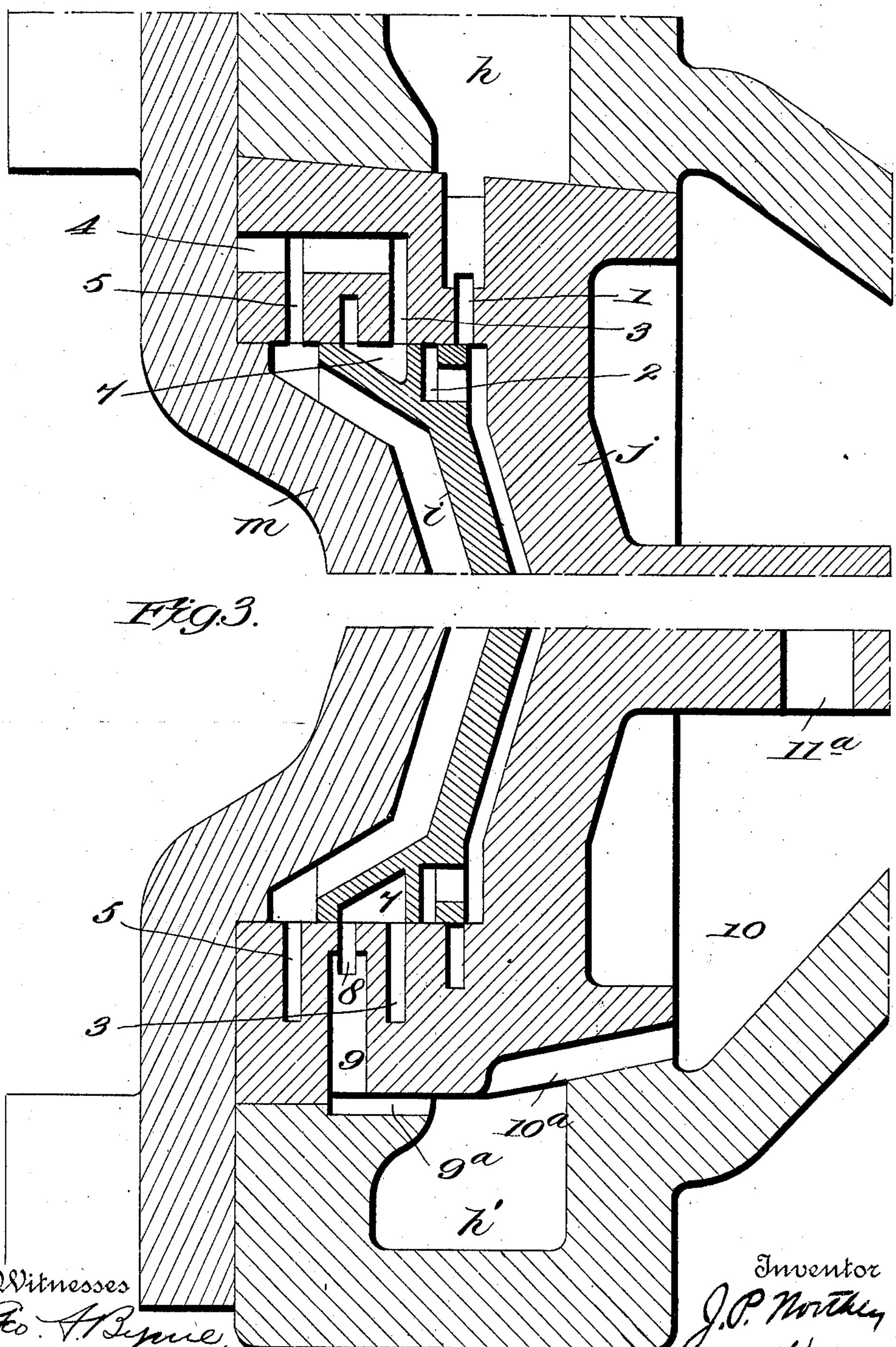

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN PELL NORTHEY, OF TORONTO, ONTARIO, CANADA.

SOUND-PRODUCING DEVICE.

976,682. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed June 5, 1908. Serial No. 436,897.

To all whom it may concern:

Be it known that I, JOHN PELL NORTHEY, a subject of His Majesty the King of Great Britain, residing at the city of Toronto, Province of Ontario, Canada, but at present of the Savoy Hotel, London, England, have invented a new and useful Improved Sound-Producing Device, of which the following is a specification.

This invention relates to sound producing devices of a character suitable for fog signaling, position locating or the like, and its object is to increase the sound in same while yet maintaining the necessary purity of tone.

This is effected by combining what are in effect two resonators in one instrument in such a way that synchronism in the air vibrations is obtained, a result which is not produced in the case of instruments of other classes, which are provided with two horns and where the vibrations are as a rule partly moved away and then passed through horns divided at a certain point. This combination of the two resonators may be effected according to my invention by so arranging the instrument that the resonators are located back to back with a single instrument or two separate instruments synchronized and supplied from one source in between.

In the accompanying drawings are shown two forms of apparatus, Figure 1 being my invention applied to a reciprocating piston or "diaphone" form of apparatus, Fig. 2 being my invention applied to a rotating cylinder or "siren" form of apparatus, and Fig. 3 is a fragmentary sectional detail view showing on an enlarged scale the various ports and passages adjacent the piston head for the incoming and exhausting fluid.

Referring first to Fig. 1, it will be seen that the sound producing air or steam after its entrance at *a* passes through a cylinder *b* having slots b^x, and through a divided piston or what might be called two pistons *c c*, separated by a partition or diaphragm *d* the cylinder terminating with resonators *e e* respectively for the two pistons which are open ended for the purpose of discharging the air vibrations they produced into them. Each piston is provided with slots c^x corresponding with the slots b^x and is preferably proportioned to give similar vibrations so that they synchronize with the result that the note produced is increased in volume and maintained in purity.

The pistons may be reciprocated in any of the usual ways such as by the enlarged head and separate steam or air supply or the arrangement illustrated may be employed. In this case there is a separate steam or air entrance *g* which passes the fluid to a passage *h* which extends half way around as an inlet passage, and the other half way around as an exhaust passage *h'* a partition h^2 separating the two. From the supply passage *h* the fluid passes through an annular port 1 in an enlarged head *j* of the cylinder *b* and between it and an enlarged head *i* of the piston or one of the pistons *c*, which it forces away from the cylinder head allowing the fluid to pass through annular ports 2 and 3 in the piston and cylinder heads respectively to holes 4 and thence by an annular port 5 in the cylinder head to the other side of the piston head so that the latter is driven in the opposite direction, the inlet port 1 being thus closed. As the ports 5 and 1 are a short distance away from the cylinder cover *m* and the part of the cylinder head opposed to the piston head respectively spaces for the fluid are left on each side of the piston which act to cushion it in either direction. The fluid passes back from the cover side of the piston head by way of the port 5, holes 4, port 3 into an annular space 7 in the piston head, then by way of annular port 8 in cylinder head to holes 9 which in turn communicate, through the port 9^a, with the exhaust passage *h'*, from which the exhaust air or steam passes, through a port 10^a, to a chamber 10, from thence, through a port 11^a to a chamber 11 and from thence through slots *n* in an extension *n'* of the cylinder and through corresponding slots *o* in the piston thus producing vibrations similar to those of the sound producing air with the result in this case, that the driving air or steam which previously was wasted, or if discharged into the resonator was so done that it disturbed the note, is utilized to increase the volume of the latter.

In the embodiment of the invention shown it will be seen that chamber 11 is open to a portion of one side of the piston head. The remaining portion of this side of the piston head is always under pressure but its area is less as will be seen than the side from which the exhaust takes place.

It will be seen that the piston *c* carrying

the enlarged head has a prolongation c^2 to guide it and to prevent the driving air or steam from escaping into the resonator e.

In Fig. 2 the air or steam entrance a' communicates with a cylinder b' having slots $b^\times$ in which is a second rotating cylinder c' also slotted as at $c^\times$, the slots $b^\times$ and $c^\times$ respectively in the fixed and rotating cylinders being at opposite tangential angles as usual so that the cylinder c' is rotated itself by the air or steam passing through. In this case the cylinder c' may be divided into two parts, or two cylinders formed by a diaphragm d' each part or cylinder c' being open ended and communicating with its resonator e'. The spindle or spindles f attached to the diaphragm d' connect with some usual form of rotating speed governor.

What I claim is—

1. A sound producing device comprising two resonators, and a note producing device including a movable part having two open ends, and means for supplying blast to said resonators through said movable part, each open end of such part communicating with one of said resonators.

2. A sound producing device comprising two resonators, a note producing device including fixed and movable parts having coacting orifices located between such resonators and open at each end to said resonators and a diaphragm dividing one of said parts.

In testimony whereof I have hereunto set my hand in the presence of the two subscribing witnesses.

JOHN PELL NORTHEY.

Witnesses:

ALLEN PARRY JONES,

EDWARD T. FOSTER.