E. R. WHITNEY.

Fog-Horn.

No. 219,374. Patented Sept. 9, 1879.

FIG. 2

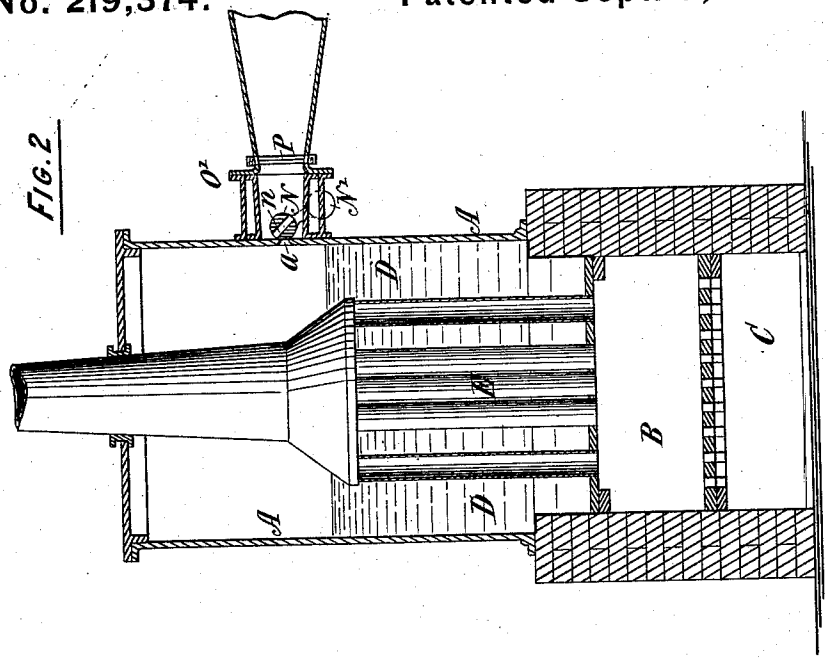



FIG. 3

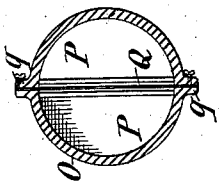



FIG. 1




Witnesses:

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# UNITED STATES PATENT OFFICE.

EDWIN R. WHITNEY, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR OF ONE-HALF HIS RIGHT TO HORACE JANSON BEEMER, OF SAME PLACE.

## IMPROVEMENT IN FOG-HORNS.

Specification forming part of Letters Patent No. **219,374**, dated September 9, 1879; application filed December 26, 1878.

*To all whom it may concern:*

Be it known that I, EDWIN RUTHVEN WHITNEY, of the city of Montreal, in the District of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Fog-Horns; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has reference to that class of stationary instruments which are operated by steam, gravitation, or other power to give out at regular intervals whistles or similar sounds of equal duration, in order to warn vessels off the dangerous points of any coast, and may be described, broadly, as consisting in the application of steam directly to the vibrating reed to produce the sound, in the mechanism required for the purpose, and, further, in the peculiar construction of such reed.

For full comprehension, however, of the devices which may be used to accomplish this, reference must be had to the annexed drawings, in which—

Figure 1 is a view, and Fig. 2 is a sectional elevation, of the apparatus; and Fig. 3 is a transverse sectional elevation through horn, showing arrangement of reed.

Similar letters of reference indicate like parts.

A is a vertical boiler, of any usual and approved construction, B being the fire-chamber, and C the ash-pit, provided, respectively, with feed-door *b* and door *c*. D is the water-space, and E the fire-tubes, all these being of the ordinary type.

F is a cylinder or drum, to which steam is admitted from the steam-space at the head of the boiler through supply-pipe F′, provided with stop-cock $f^1$. G is a bucket or short cylinder, with one closed end, sliding freely in the cylinder F, and having formed in one side an aperture or port, *g*, corresponding in size to a similar opening, $f^2$, giving communication between F and the shell H′, of the form shown in Fig. 1, in which revolves a wheel, H, with curved buckets or vanes *h*. A coiled or other suitable compression-spring, I, adjusted by a set-screw, I′, keeps the bucket G in position when impinged upon by the steam.

Upon the spindle K of the wheel H, and revolving with it, is mounted a pinion driving a train of gears arranged to retard the motion to any desired rate of speed.

Upon the axis of the uppermost gear is secured an arc composed of two or more pieces, L L′, so arranged that the number of degrees may be varied at pleasure. This may be done by making the arc in two or more thicknesses, so as to slide past each other something like the sticks of a fan, and with any suitable device to hold them in the postion desired; or the arc may be divided up radially into two or more parts, opened out at will from each other, on the peripheries of all these sections being formed a groove in which slides a plate, curved to the corresponding arc, secured to one of the sections, and retaining the others in the position desired. This arc in its revolution impinges upon and presses down a pivoted arm, M, secured on the end of a cylinder, N, passing transversely through the base O′ of the fog-horn proper, O, which may be of any suitable size and configuration.

In the cylinder N is formed a port, *n*, corresponding in size to a port, *a*, in the steam-chest of the boiler, and on the opposite end of the cylinder N is secured a counterbalance-weight, N′, serving to keep the arm M in its normal position, except when acted upon by the arc.

Within the fog-horn O, where shown in Fig. 2, or at any other convenient point, are placed two diaphragms, P P, preferably flanged on their edges, between them being arranged edgewise a reed plate, Q, held at either end by clamps and set-screws *g*, as shown in Fig. 3, or in any other suitable way. This plate may, if desired, be grooved or slotted on its outer face, or have its edge somewhat twisted, so as to modify and increase the sound.

The supports for the drum F and bearings for the spindle K and those of the different gears may be formed in any suitable standard, R, either separate, secured to, or forming part of the boiler itself.

The operation of the invention will be as follows: The stop-cock $f^1$ being opened, the steam passes along the pipe F′ into the cylinder F, and thence through the ports *g* and $f^2$ into the shell H′, between the buckets or vanes

$h$, rotating the wheel H, and passing off through the section of the shell which is cut away.

In the cylinder F is placed the short cylinder or bucket G, fitting therein with sufficient accuracy to prevent the passage of steam between the meeting surfaces, and having its normal postion such that the aperture or port $g$ formed therein will coincide with a similar opening, $f^2$, in the cylinder F. The closed end of the cylinder G impinges upon the coiled compression-spring I, contained in the cylinder F, and having at its other end a set-screw, I′, to tighten it up, if required.

The amount of steam introduced into the wheel H and the consequent speed at which it revolves may be easily regulated by turning the set-screw I′ and tightening up the spring, thus diminishing the size of the steam-port, the same result happening when an overpressure of steam pushes the bucket G forward so as to slide the port $g$ partially past the port $f^2$.

The revolution of the spindle K rotates (through the train of gears) the arc L, which, coming in contact with the pivoted arm M, presses it down while passing over it, and during this time brings the port $n$ in the cylinder N in communication with the aperture $a$, thus allowing the steam to pass from the steam-chamber of the boiler into the base O′ of the fog-horn and strike directly against the diaphragms P and reed Q, thus causing the latter to give out a very loud, shrill, and piercing sound the whole time that the arm N is kept pressed down by the arc L. As soon, however, as the arm is released the counterbalance N′ brings it back to its normal position, turning the cylinder N, and cutting off all communication between the steam-chamber and horn.

It will easily be seen that by varying the gearing the arc may be made to revolve at any rate of speed desired, so as to shorten or prolong the time during which the sound is emitted, and the proportion of the silent interval to the length of the sound may be varied by drawing apart the sections of which the arc is composed, and thus lengthening it, the plate L′ insuring a continuous curve.

The arrangement of the reed enables it to be replaced easily should it be desired to alter the sound; but it will clearly be understood that I do not confine myself entirely to the reed as shown, as the ordinary vibrating tongue may be used, and, on the other hand, my improved reed be employed in fog-horns of other construction.

Having thus described my invention, what I claim is as follows:

1. In a fog horn or signal, the combination, with the fog-horn proper and steam-chest, of a cylinder, N, having a transverse port therein, and provided with an arm, M, and a counter-balance, a cam-plate and its operative gearing, and a steam bucket or wheel, the combination being controlled by a governing device which regulates the amount of steam admitted to the operating mechanism.

2. In an automatic fog horn or signal, the combination, with the sound-producing mechanism, of a cam-plate operating the same, and composed of sections radially divided or made in thicknesses so as to embrace a greater or less number of degrees of the circle, substantially as and for the purposes herein set forth.

3. In a fog horn or signal, the sound-producing mechanism, consisting of a vibrating plate secured edgewise in the slit of a diaphragm set in the horn, substantially as herein described.

4. The combination of the drum F with internal cylinder, G, adjustable as to position, and communicating with wheel H, all as herein set forth, and for the purposes described.

E. R. WHITNEY.

Witnesses:
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