(No Model.)

O. C. HANSEN.

FOG HORN.

No. 261,343. Patented July 18, 1882.

Fig. 1

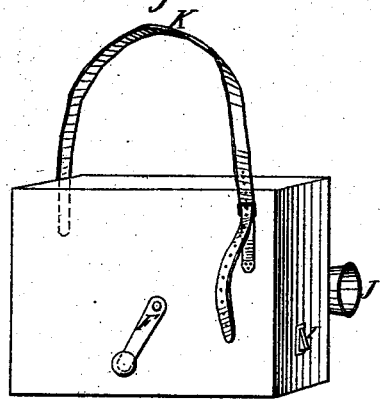


Fig. 2

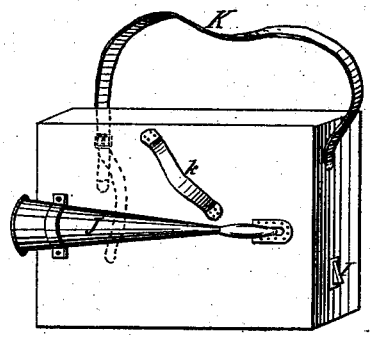


Fig. 3

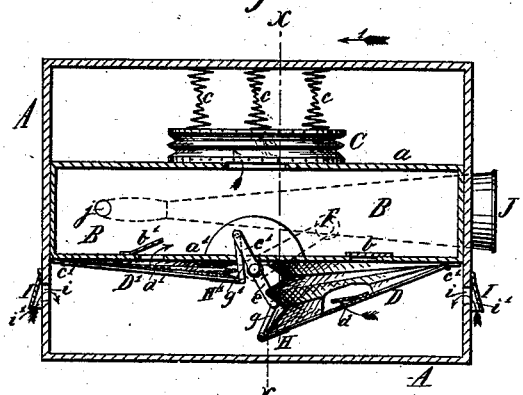
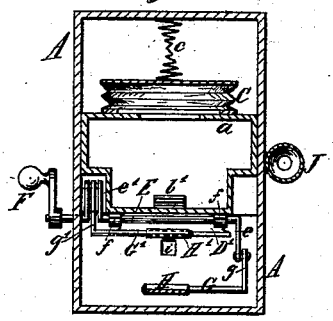


Fig. 4



Witnesses:
O. F. Malmborg.
Alex. F. Roberts

Inventor:
Ole Christian Hansen
by N. W. Almqvist
Attorney.

UNITED STATES PATENT OFFICE.

OLE CHRISTIAN HANSEN, OF SKUDESNŒS, NORWAY.

FOG-HORN.

SPECIFICATION forming part of Letters Patent No. 261,343, dated July 18, 1882.

Application filed May 18, 1882. (No model.) Patented in England May 24, 1881, No. 2,259; in Denmark July 6, 1881, No. 455; in Norway August 2, 1881, No. 3,514; in Belgium November 22, 1881, No. 56,299; in France November 23, 1881, No. 145,989, and in Sweden March 3, 1882.

To all whom it may concern:

Be it known that I, OLE CHRISTIAN HANSEN, a citizen of Norway, and resident of Skudesnœs, in the Kingdom of Norway, have invented a new and useful Improvement in Fog-Horns, of which the following is a specification.

My invention relates to signal devices known as "fog-horns," or such as are used on board of ships to produce signals of sound in foggy weather when signals of light are not discernible.

The object of the invention is to provide a light, compact, and conveniently-portable apparatus whereby a sound of great strength may be obtained and the duration of each blow of the horn may be increased to continue uninterruptedly for any desired length of time, so as to produce a succession of short blows or long blows, or a continuous roar.

In the accompanying drawings, Figure 1 represents a perspective exterior view of my said improved apparatus seen from the right. Fig. 2 is a similar view of the same seen from the left side. Fig. 3 is a longitudinal sectional elevation; and Fig. 4 is a vertical cross-section taken on the line *x x* of Fig. 3, and seen in the direction of the arrow 1.

Like letters of reference indicate like parts in the several figures.

A is a casing, being simply a box of about the same proportion in height, length, and width as that shown in the drawings. This is divided longitudinally by two rigid partitions, forming between them a central chamber, B, on whose top or upper wall, *a*, above an opening therein, is placed a pressure-regulating bellows, C, of flexible sides and rigid top, between which latter and the top of the box A there are inserted three spiral springs, *c*, tending to compress the bellows C with a tension of about ten pounds. The bottom *a'* of the central air-chamber, B, is provided with two openings covered with inwardly-opening valves *b* and *b'*, underneath which are two ordinary bellows, D and D', hinged to the bottom *a'* at *c'* in position to face each other, as shown in Fig. 3, the said bellows being provided with the inwardly-opening air-valves *d* and *d'*. Between the two bellows D D' is mounted in bearings *f*, attached to and underneath the bottom *a'* of the central chamber, B, a shaft, E, provided with two cranks, *e* and *e'*, placed oppositely of the shaft. One end of the shaft E projects through the right-side wall of the box A, and is provided with a hand-crank, F, by turning which the shaft is revolved.

G and G' are angular rods fixed so as to form the pintles of two hinges, H and H', which are attached respectively to the front ends of the rigid portions of the bellows D D'. The parts *g* and *g'* of the rods G G', which form right angles to the hinged portion of the said rods, are pivoted with their free ends to the cranks *e* and *e'*, respectively, so that when the shaft E is revolved the two bellows D D' will be operated simultaneously, one forcing air into the chamber B—for instance, through the valve *b'*, as shown in Fig. 3—while the other bellows is supplied with air through the valve *d*. The necessary supply of the outer air enters the box A through its opposite end openings, *i*, which are provided with metallic covers I, which said covers are closed to the box A on the upper and the two vertical sides, and leaving an opening at the lower edges, as seen at I' in Fig. 3. This construction of the covers I prevents rain from entering the box A. The air thus supplied by the bellows D D' to the central chamber, B, during the revolving of the shaft E, has constantly free access to the upper spring-pressed bellows, C, and, according to the rapidity with which the shaft is revolved, will naturally expand the said bellows C to compress the springs *c*, which latter, on the slowing or cessation of the movement of the shaft, react upon the bellows C, and by their tension not only prolong the sound a few seconds after the shaft has ceased to turn, but also, during the more or less rapid movement of the shaft, by their elasticity modify the tension of the compressed air. The air from the chamber B issues through a small opening, *j*, on the left side of the box to and through the ordinary organ tongue or reed of the usual fog-horn, J, secured on the outside to the said left side of the box A, as shown in the drawings.

As the sound of the horn is produced by a revolving instead of a reciprocating movement,

it is evident that it may be prolonged indefinitely by an uninterrupted continuation of said movement, and be increased in intensity by increasing the rapidity of said movement.

When in use the apparatus is held in front of the operator by the strap K, placed around his shoulder, while his left hand holds the strap *k* to keep the box A in position, and the right hand turns the crank F.

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

1. In a fog-signal apparatus, the combination, with a horn, J, and air-chamber B, of the bellows D D′, having suitable link-connections, *g g′*, and the shaft E, provided with oppositely-placed cranks *e e′* and turn-handle F, substantially as hereinbefore set forth.

2. In a fog-signal apparatus, the combination, with the horn J, of the box A, having air-vents *i*, and provided interiorly with the rigid air-chamber B, the latter having a superadjacent spring-pressed regulating-bellows, *c*, and the subadjacent bellows D D′, operated simultaneously by the revolving of the double crank-shaft E, substantially as and for the purpose hereinbefore set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 25th day of April, 1882.

OLE CHRISTIAN HANSEN.

Witnesses:

THORLJOM WAAG,

P. T. PEDERSEN.