

No. 614,215.

G. J. PIETERS.

Patented Nov. 15, 1898.

FOG HORN.

(Application filed Aug. 1, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

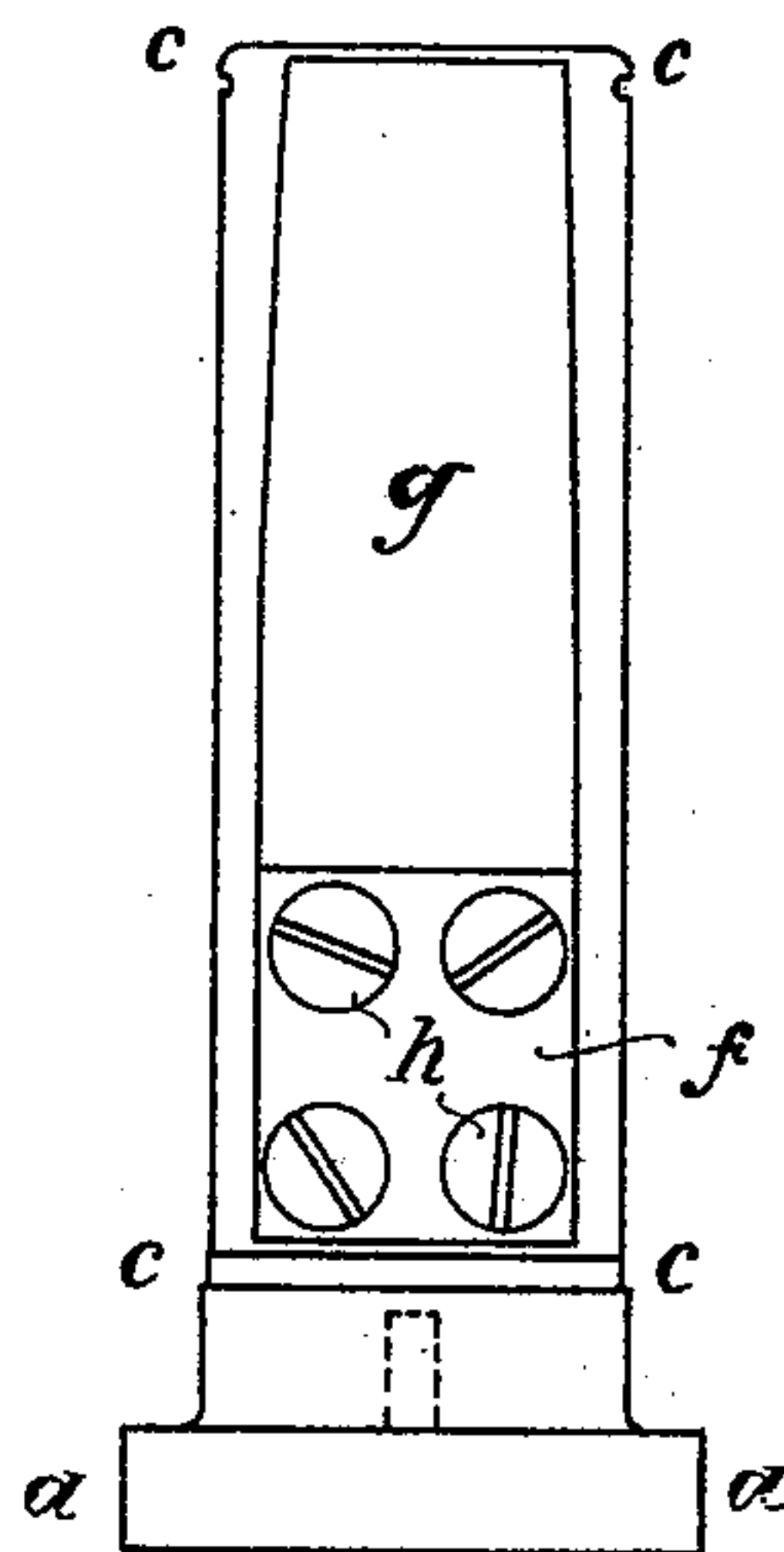


Fig. 2.

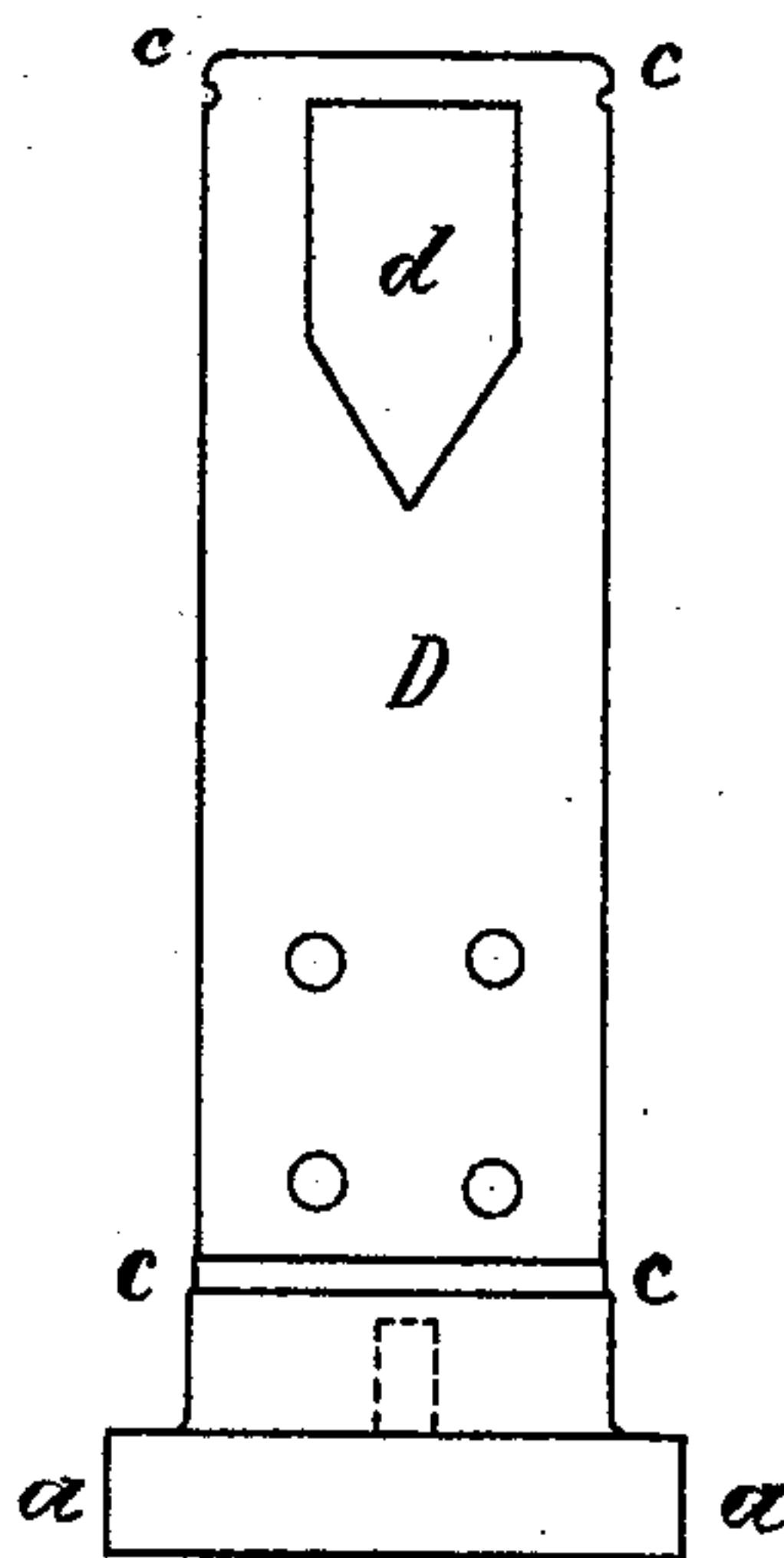


Fig. 3.

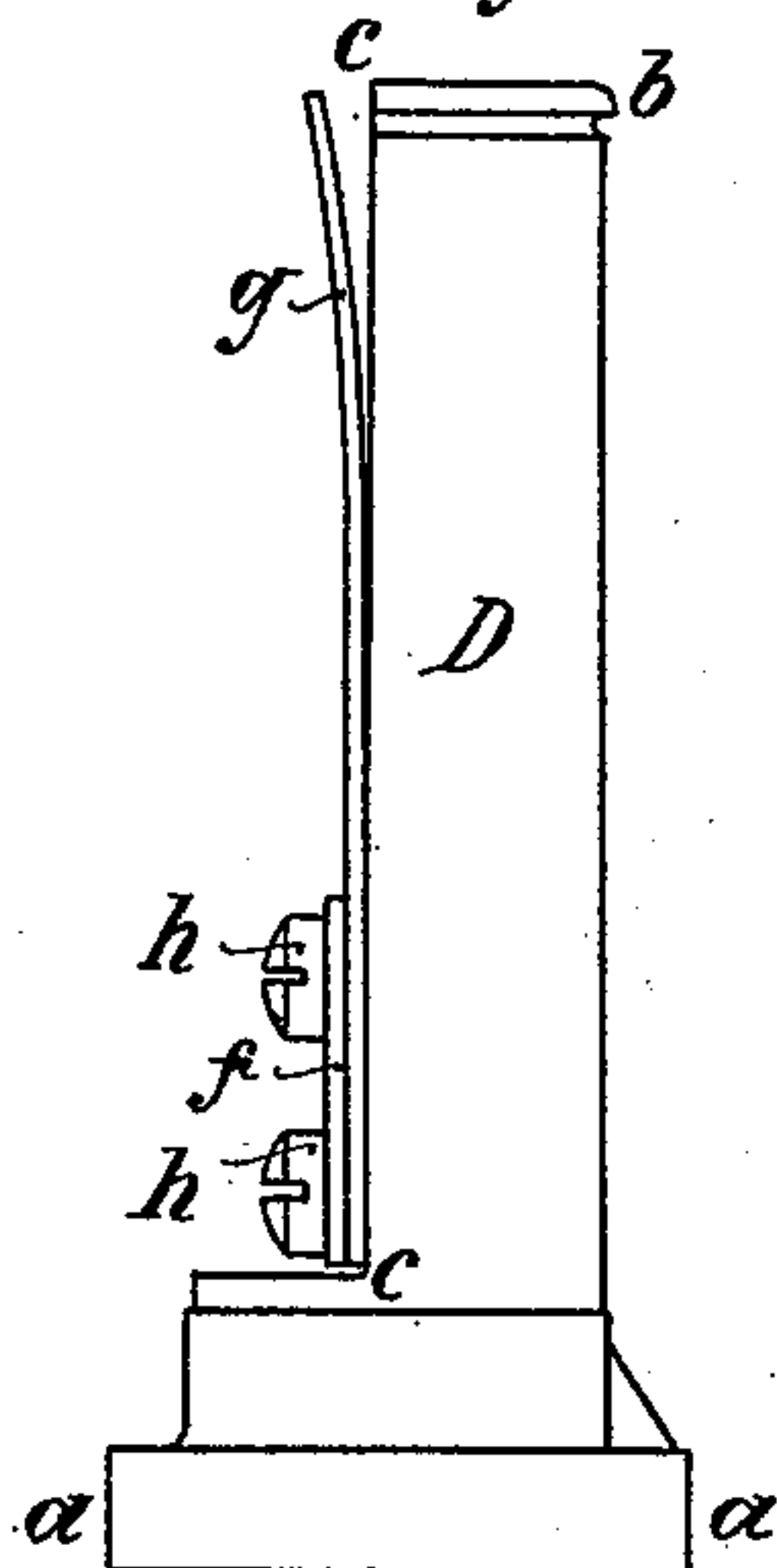
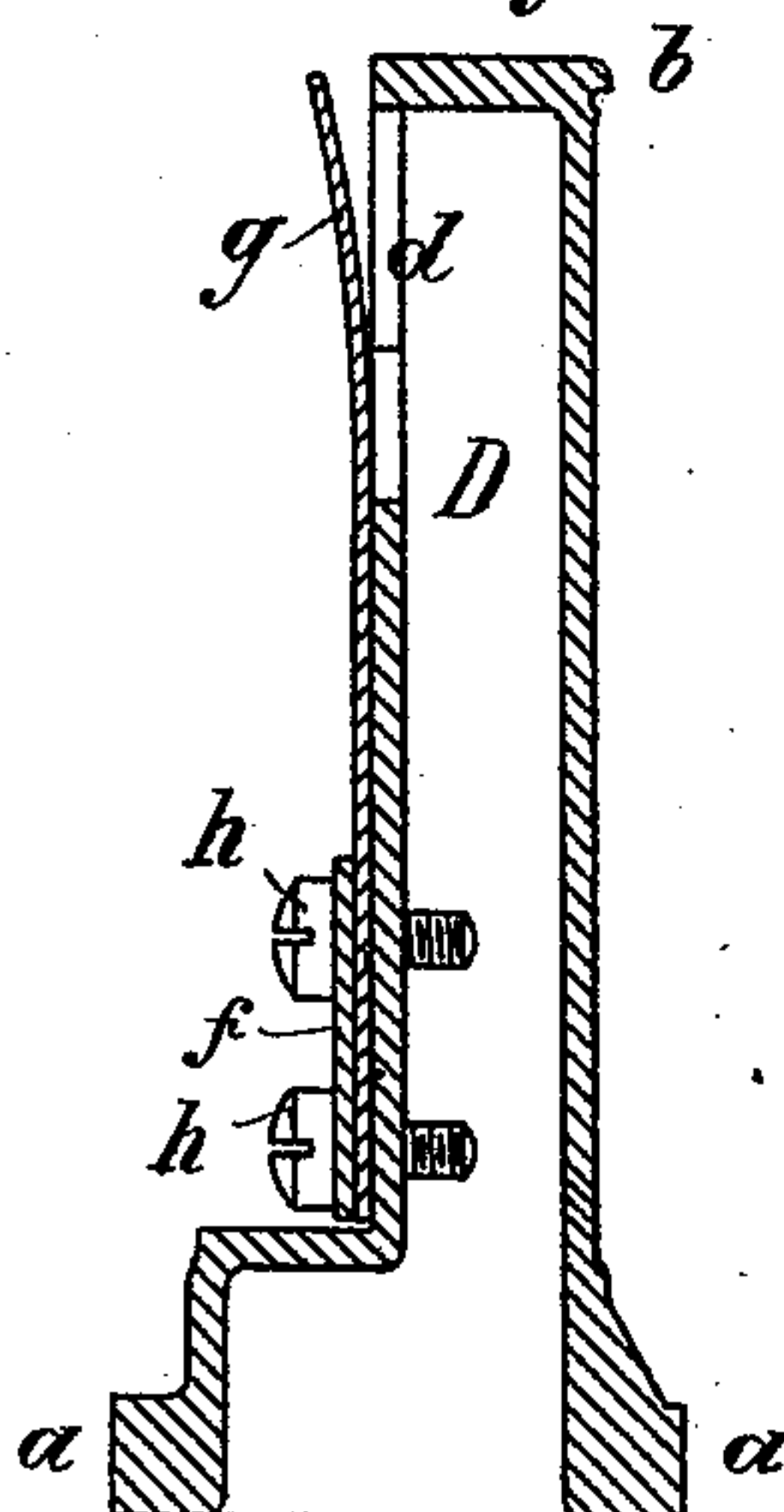


Fig. 4.



Witnesses
James D. Stearns
F. Philip Turnworth

Inventor
Gerardus Johannes Pieters
by Foster Freeman
Attorneys

No. 614,215.

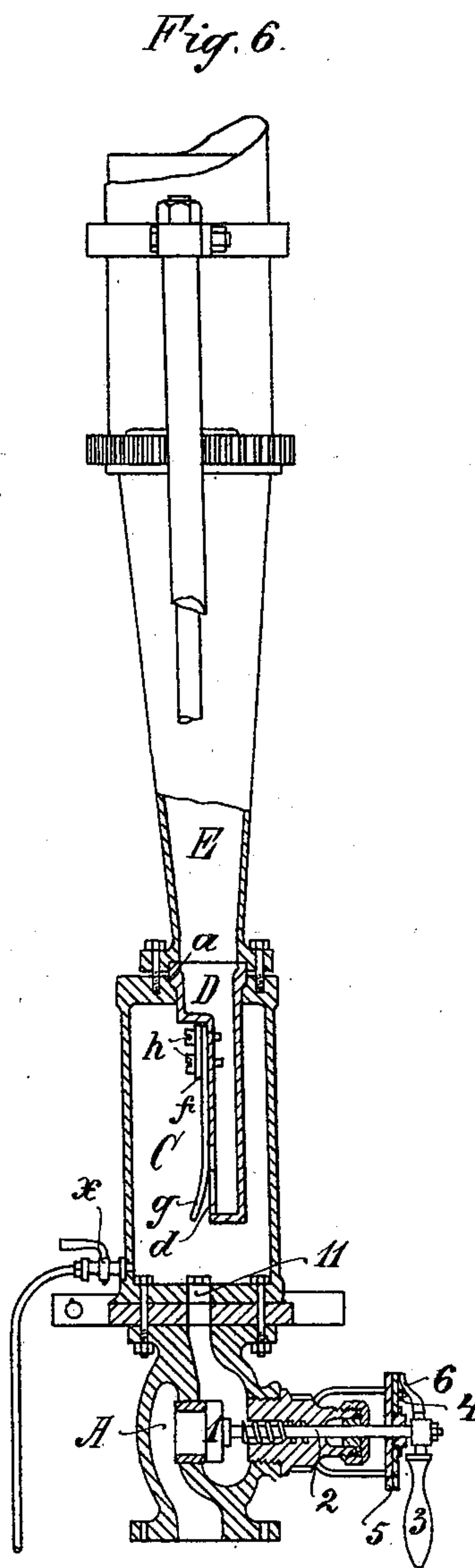
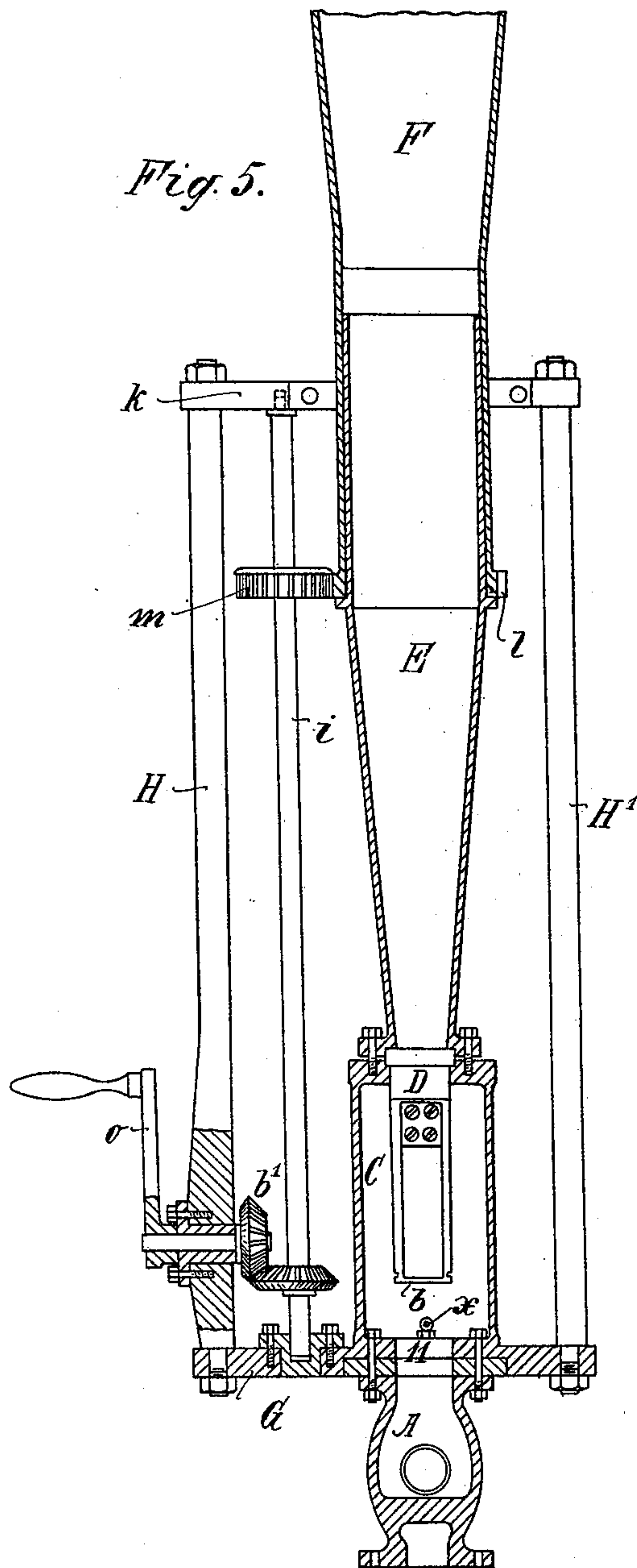
Patented Nov. 15, 1898.

G. J. PIETERS.
FOG HORN.

(Application filed Aug. 1, 1898.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses
James W. Stearns
T. Philip Farnsworth

Inventors
Gerrardus Johannes Pieters
by Foster Freeman
attorneys.

No. 614,215.

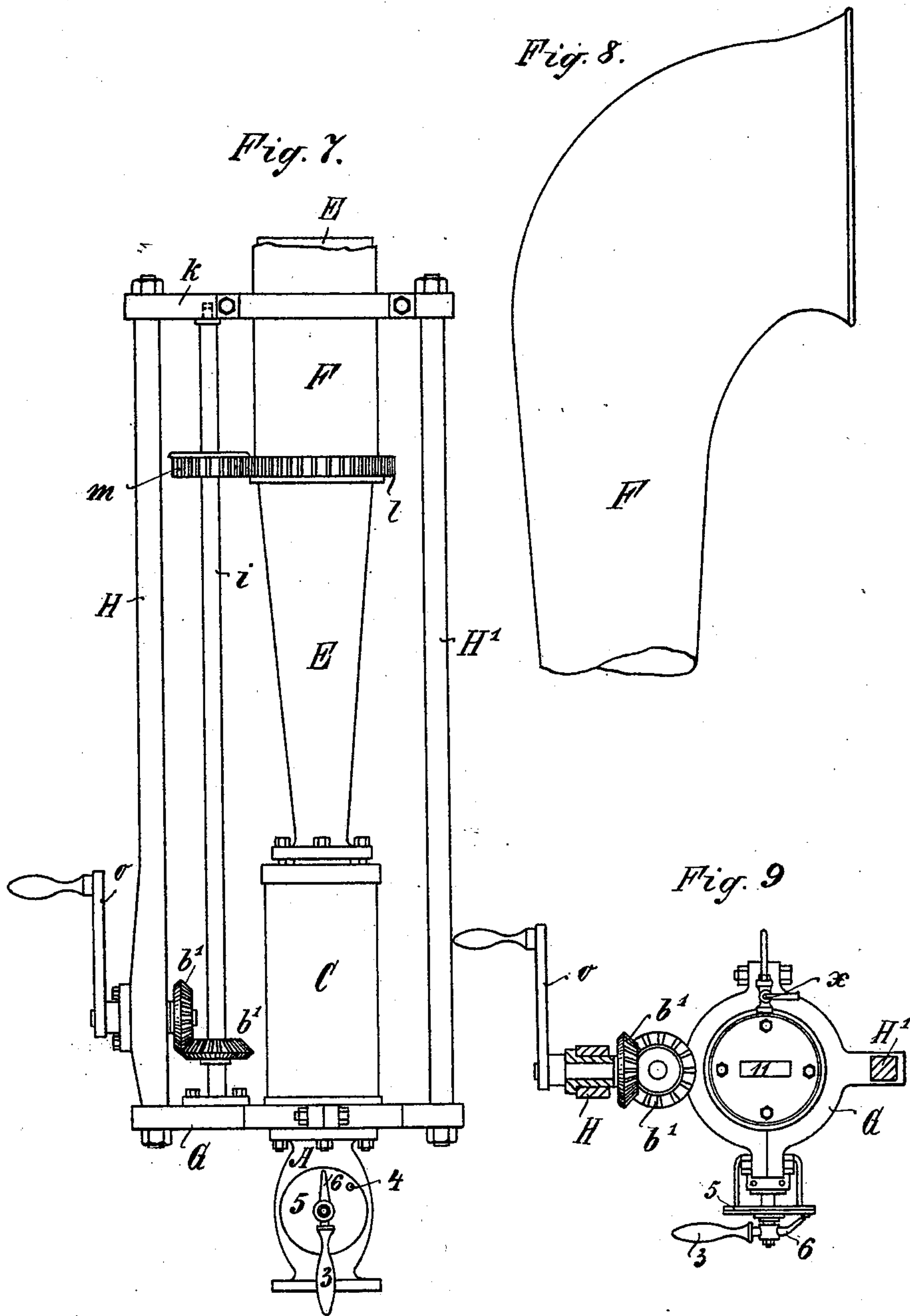
Patented Nov. 15, 1898.

G. J. PIETERS.
FOG HORN.

(Application filed Aug. 1, 1898.)

(No Model.)

4 Sheets—Sheet 3.



*J. Messers
Tanner & Son
F. Philip Farnsworth*

*Inventor
Gerardus Johannes Pieters
4 Foster Truman
Attorneys.*

No. 614,215.

Patented Nov. 15, 1898.

G. J. PIETERS.
FOG HORN.

(Application filed Aug. 1, 1898.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 10.

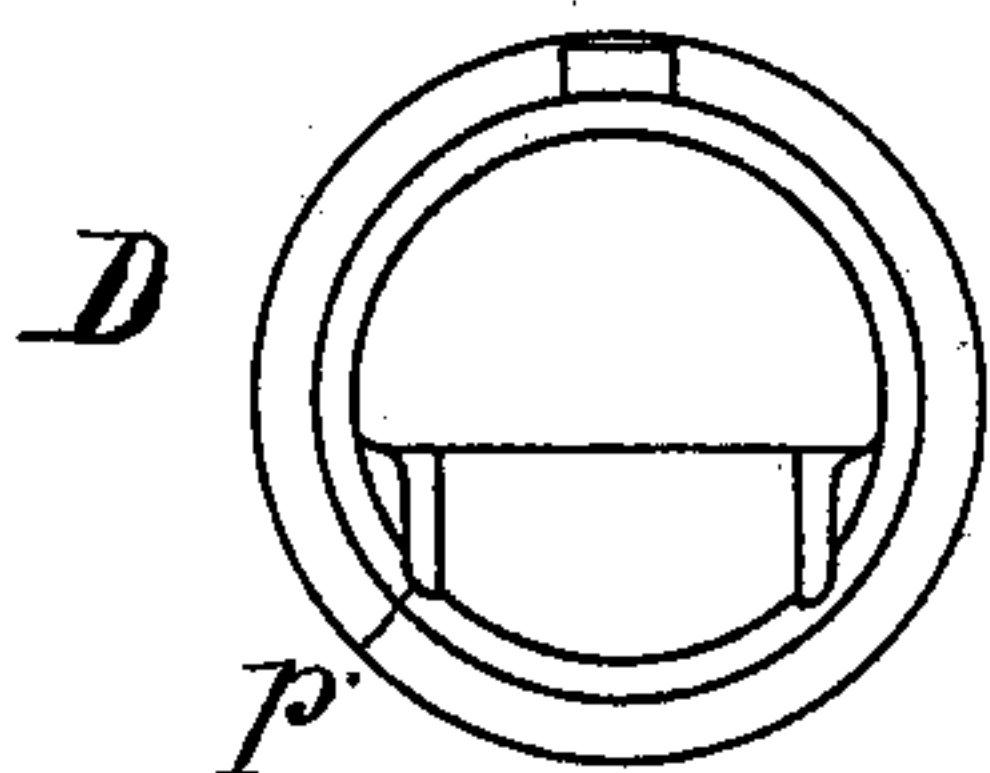


Fig. 11

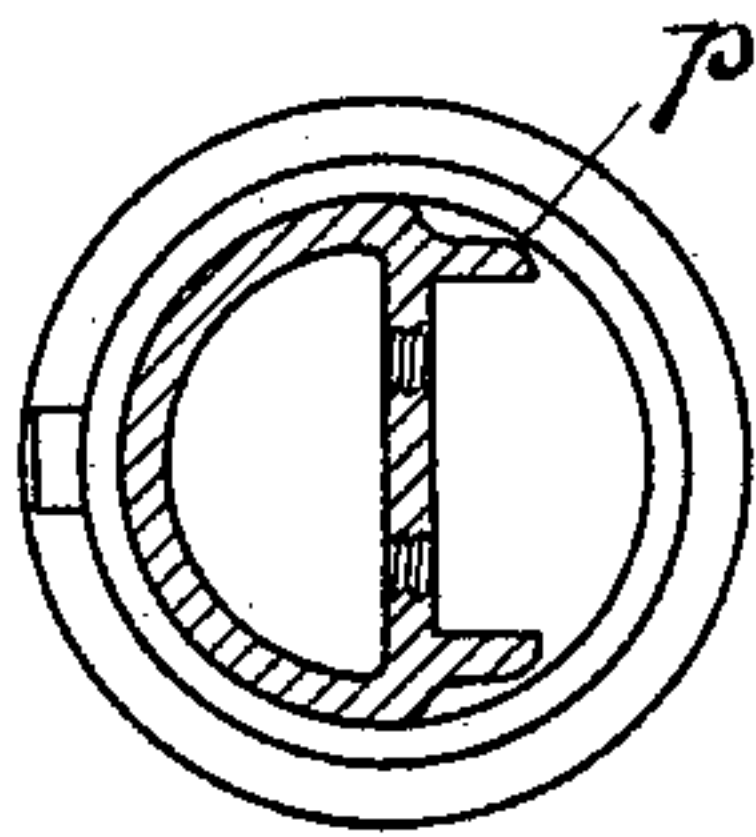


Fig. 12.

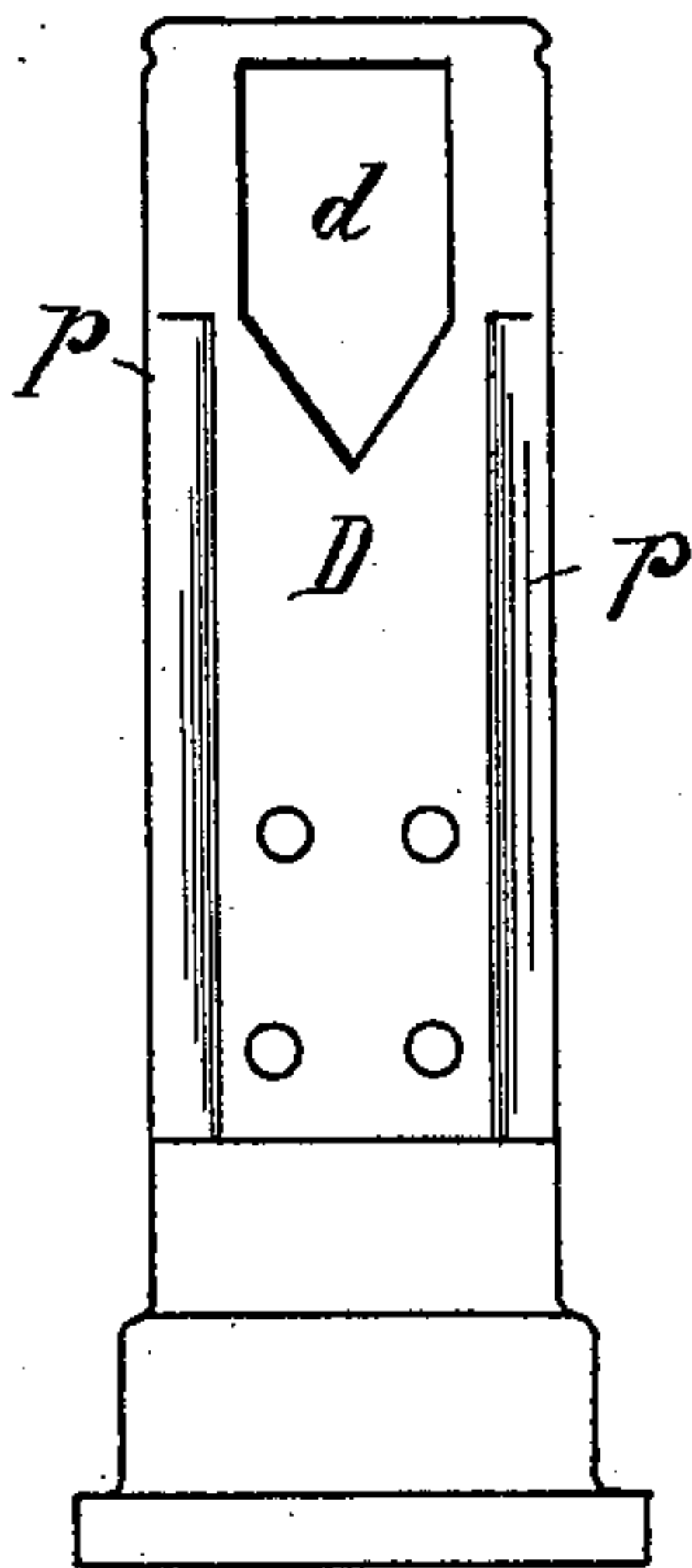
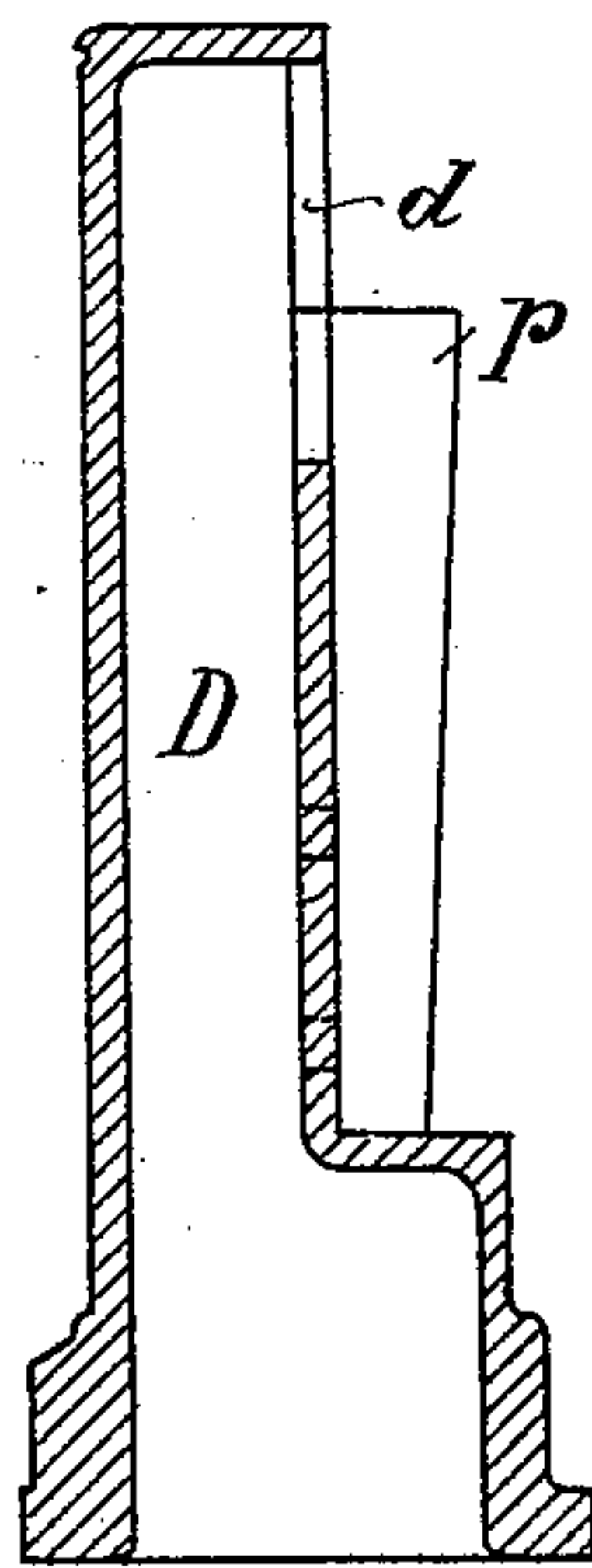


Fig. 13.



Witnesses
T. J. Parnsworth
T. J. Parnsworth

Inventor
Gerardus Johannes Pieters
by *Harold Freeman*
Attorneys

UNITED STATES PATENT OFFICE.

GERARDES JOHANNUS PIETERS, OF AMSTERDAM, NETHERLANDS.

FOG-HORN.

SPECIFICATION forming part of Letters Patent No. 614,215, dated November 15, 1898.

Application filed August 1, 1898. Serial No. 687,450. (No model.)

To all whom it may concern:

Be it known that I, GERARDES JOHANNUS PIETERS, a subject of the Queen of the Netherlands, residing at Amsterdam, in the Kingdom of the Netherlands, have invented certain new and useful Improvements in Fog-Horns, (for which I have applied for a patent in Germany, filed February 4, 1898; in Russia, filed June 20, 1898; in Austria, filed February 11, 1898; in Belgium, filed February 9, 1898; in Italy, filed March 7, 1898; in England, filed September 22, 1897, and in France, filed June 22, 1898,) of which the following is a specification.

This invention relates to an improved construction of fog-horns having reeds worked by steam or other elastic fluid under pressure, whereby with a comparatively small expenditure of power I obtain sounds purer and stronger and capable of being heard at greater distances than the sounds of fog-horns as they are usually constructed, the sound being given out in such manner that the position of the fog-horn can be accurately determined by the strength thereof. This object is fulfilled, according to the present invention, by effecting the vibration of the reed not merely by the pressure of the steam, as heretofore, but also by utilizing the velocity of issue or the *vis viva* of the steam for this purpose and by admitting only a definite quantity of steam, determined by experiment.

In order to utilize the velocity of the steam, the arrangement of the fog-horn is such that the reed is situated directly in front of the steam-inlet. The latter must be made of a rectangular cross-section such that the length of the rectangle corresponds to the width of the reed, while the width of the inlet corresponds with the range of vibration of the reed. These proportions are of importance not only because thereby the entire steam-jet is led directly against the reed and is consequently better utilized, but also because all particles of steam that might rise uselessly at the side of the reed would only increase the steam-pressure in the cylinder in which the mouthpiece carrying the reed is arranged, whereby the vibration of the reed would be reduced and even might be entirely prevented. This defect is also prevented in the improved construction by providing the

cylinder with an escape-valve. Experiments have shown that this also has a most marked influence upon the purity and strength of the tone.

In order to prevent the possibility of the fracturing of the reed under the increased strain to which it is subject by the improved construction, a peculiar configuration is imparted to the opening of the mouthpiece through which the steam escapes under the reed, such configuration being made to correspond to the form of the steam-jet. By this means the steam-jet is made to act in an undivided manner only on the free end of the reed, and a fracturing of the latter, such as occurs when the steam-jet tends to force the reed away near its weakest point, usually in the middle, is avoided.

For insuring a sharper sounding of the reed this is fixed not merely by screws, as heretofore, but through the medium of an unelastic intermediate plate.

In order to insure that only a definite quantity of steam shall pass to the reed, as above stated, and thus to prevent the occurrence of too great a compression, causing interference with the vibration of the reed in the cylinder, notwithstanding the provision of the escape-valve, the spindle of the inlet-valve is provided—for example, at the handle—with a projecting arm, which after turning the spindle through a certain angle is made to strike against a stop on an adjustable disk, so as to prevent the further rotation of the spindle, and consequently the further opening of the valve.

By the above-described means the greatest possible extent of vibration of the reed, and consequently the greatest amplitude of the sound-waves, is obtained, resulting in a very sharp pure sound, which when led off through a horn will travel to great distances even against a strong wind, and which, if the upper part of the horn be gradually turned around, renders it still more easy to determine from the strength of the sound, which is greatest in the axial line of the fog-horn's mouth, the exact point at or direction in which the fog-horn is situated. The length of the horn should be so made that the vibrations of the reed work in unison with the vibrations of the column of air in the horn—i. e., the horn

ought to sound with the reed. It is of importance that only the upper part of the horn should be made to turn, and not the entire apparatus, because in the latter case an interference in the production of the sound could ensue, which does not occur in the former case.

In the accompanying drawings, forming a part of this specification, and in which like letters and numerals of reference designate corresponding parts, Figure 1 is a front elevation of the mouthpiece of the improved fog-horn. Fig. 2 is a similar view with the reed removed. Fig. 3 is a side view of the same. Fig. 4 is a vertical sectional view thereof. Fig. 5 is a vertical sectional view of the horn as an entirety; Fig. 6, a similar view at right angles to Fig. 5. Fig. 7 is a side elevation of the horn. Fig. 8 is a detail view of the mouth of the horn, one end being broken away. Fig. 9 is a transverse sectional view of the fog-horn. Fig. 10 is an end view of a modified form of mouthpiece. Fig. 11 is a cross-sectional view thereof. Fig. 12 is a front elevation of the same with the reed removed, and Fig. 13 is a vertical sectional view.

Referring more particularly to the drawings, D designates the mouthpiece, having a peculiarly-shaped escape-opening *d* with square lower part and pointed equilateral triangular upper end, over which the reed *h* is secured by means of screws *h* and intermediate plate *f*. The mouthpiece is suspended by its upper rim *a* in the casing C of the fog-horn, as shown in Figs. 5 to 9, and is so arranged in the casing C that the lower edge of the reed *g* is exactly over the steam-inlet 11 of the valve-casing A, as shown at Figs. 5 and 6. The regulation of the steam-jet is effected by the valve 1 with spindle 2, handle 3, arm 6, and disk 5 with stud 4, Fig. 7. The casing C has, as shown at Figs. 5 and 6, an outlet *x*, operating as an escape-valve. Over the mouthpiece D is fixed, upon the casing C, the funnel-shaped sound-delivery tube E, and on the cylindrical upper end of this is fitted loose the mouth of the fog-horn F. The rotation hereof is shown effected, by way of example, by means of a hand-wheel *o*, bevel-wheels *b' b'*, spindle *i*, carried in the base-plate G, and the cross-head K, supported by standards H and toothed wheels *m l*.

As with the improved fog-horn the pitch of the sound can be accurately adjusted, it is possible to employ it as signaling apparatus, in particular if two fog-horns with notes of different pitch be employed. Such two fog-horns may either be separate or they may be combined in one apparatus.

In Figs. 10 to 13 a somewhat modified form of mouthpiece is illustrated. In this construction the mouthpiece D is provided on

its face with longitudinal side ribs *p*, between which the reed is adapted to freely vibrate. These ribs preferably extend from the secured end of the reed to a point in alignment with the widest part of the opening *d*.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a fog-horn the combination of a casing, a mouthpiece within the casing having an opening in its side, a reed secured at one end and arranged to vibrate above the opening, said opening being contracted in the direction of the secured end of the reed, a sound-delivery tube leading from the mouthpiece and an inlet-pipe communicating with the casing arranged to deliver fluid under pressure against the face of the reed at the free end thereof, substantially as described.

2. In a fog-horn the combination of a casing, a mouthpiece within the casing having an opening in its side, a reed secured at one end and arranged to vibrate above the opening, said opening being contracted in the direction of the secured end of the reed, a sound-delivery tube having a rotatable end leading from the mouthpiece, means for rotating the end of the tube, and an inlet-pipe communicating with the casing arranged to deliver fluid under pressure against the face of the reed at the free end thereof, substantially as described.

3. In a fog-horn, the combination of a casing, a mouthpiece within the casing having an opening in its side, a reed adapted to vibrate above said opening, a sound-delivery tube leading from the mouthpiece, an inlet-opening for compressed fluid leading into the casing in close proximity to the reed the length of said opening corresponding to the width of the reed and corresponding in width to the range of vibration of the reed, substantially as described.

4. In a fog-horn, the combination of a casing, a mouthpiece within the casing having an opening in one side and provided with separated guide-ribs, a reed secured to vibrate between the ribs and above the opening, a sound-delivery tube leading from the mouthpiece and a compressed-fluid inlet opening in the casing arranged to direct the fluid in contact with the face of the reed, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GERARDES JOHANNUS PIETERS.

Witnesses:

WILLY ZIMMERMANN,
GUSTAV HÜLSMANN.