

H. S. A. RYDBERG.
DIAPHRAGM SOUNDER AND THE LIKE.
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Fig. 1

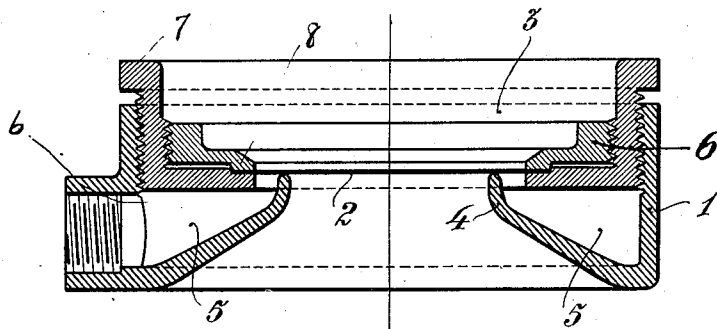
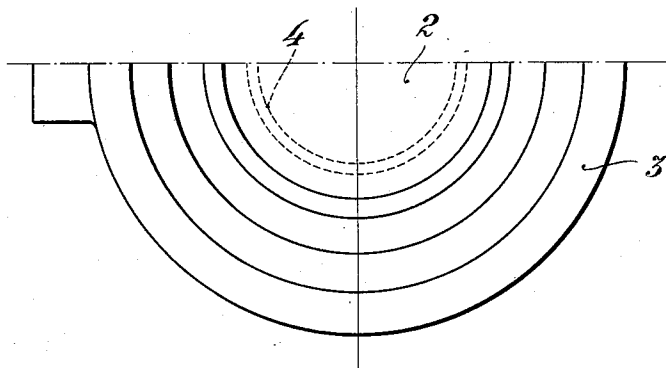


Fig. 2



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DIAPHRAGM-SOUNDER AND THE LIKE.

1,335,921.

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To all whom it may concern:

Be it known that I, HELGE SVEN ALBERT RYDBERG, a citizen of the Kingdom of Sweden, and residing at the Physical Institution, Lund, in the county of Malmöhus, Kingdom of Sweden, have invented certain new and useful Improvements in Diaphragm-Sounders and the like, of which the following is a full, clear, and exact description.

My invention relates to such apparatuses for signaling in water or in air or generally for bringing about vibrations which consist of an elastic member or a membrane or a member acted upon by a spring and resting against a ring shaped edge. When acted upon by a pressure such membrane will be brought into vibrations in a known way and during these vibrations the pressure fluid will pass between the membrane and the ring shaped edge.

In such apparatuses hitherto known the membrane is pressed against the edge of a pipe inclosed in such a way that the membrane covers both the end of the inner pipe, which serves as outlet for the pressure medium, and the annular space between the pipe and the casing. This pipe, however, always effects that the tune produced by the vibrations of the membrane is lowered and this is the case even if the length of the outlet pipe is adapted according to the theory of common organ-pipes. Besides, the apparatus becomes bulky and heavy and this inconvenience is conspicuous especially in submarine signaling where larger and heavier pipes must be used.

It is the object of my invention to provide an apparatus in which these inconveniences are done away with.

The invention is illustrated in the accompanying drawing in which,

Figure 1 is a longitudinal sectional view of a vibrator for submarine use. Fig. 2 is a plan view of one half of the vibrator.

The apparatus consists of an annular frame or casing 1 in which a membrane 2 is fastened into a sleeve 3 movable in a longitudinal direction in relation to the frame 1. The membrane 2 is fastened in such a way that it rests against the edge of a flange 4 extending from the frame and directed obliquely inward, which flange is intended to replace the outlet pipe. Between this flange 4, the frame 1, the outer part of the membrane, and the sleeve 3 is formed an

annular chamber 5 into which an inlet pipe for the fluid opens. When the fluid under pressure is led to the chamber 5 it passes in a known way between the membrane and the edge of the flange 4 during the vibrations or oscillations of the membrane. By giving the flange 4 the form shown in the drawing or a similar form so that it diverges from the membrane the influence exerted on the tune from the membrane by a pipe placed perpendicular to the membrane will be totally nullified, and experiments have shown that the effect of the new apparatus is essentially increased.

The diaphragm 2 is clamped on the seat of the flange by a clamping ring which is threaded into the cylindrical diaphragm holder. The diaphragm holder has an inwardly extending annular flange located between the lip and the casing 1, and arranged in spaced relation with the said lip. The clamping member which is threaded into the diaphragm holder is provided at the inner edge of its coacting flange with a circumferential rib which clamps the diaphragm in the recess forming the diaphragm seat.

The flange 4, which is conical, is truncated at the apex and it is united with one end of the casing and extends therefrom at one side of the inlet to a point beyond the plane of the opposite side of the inlet and the fluid space surrounding the conical flange tapers radially from the casing to the space between the truncated end of the conical flange and the diaphragm seat. A diaphragm seat is formed by recessing the annular flange 6 of the diaphragm holder 7 and the clamping ring is provided with a projecting flange 8 for engaging the diaphragm to retain the same on its seat.

Of course, a pipe very short in relation to the diameter of the membrane does not exert any influence materially upon the function of the apparatus, as for instance when the length of the pipe is shorter than the diameter of the membrane. Thus the portion of the flange 4 nearest to the membrane may also form a right angle to the membrane, but this portion must in such case be short compared with the diameter of the membrane, in order that it may not act disturbing on the tune.

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

Means for producing vibrations, compris-

ing a cylindrical casing, provided at one side adjacent to one end with a fluid inlet, the other end of the casing being interiorly threaded, a conical flange united with the casing at the end thereof, adjacent the inlet and extending inwardly therefrom and truncated at the apex and provided thereat with an abrupt, cylindrical lip arranged substantially concentric with the casing and constituting an outlet, an adjustable cylindrical diaphragm holder, exteriorly threaded to engage the threads of the casing and mounted within the threaded end thereof and provided at its inner end with an inwardly extending annular flange surrounding said lip and spaced therefrom, and recessed at its inner edge to form a diaphragm seat located in substantially the plane of the end of the said lip, a diaphragm

arranged on the said seat and extending over the lip and covering the outlet, and a clamping ring threaded into the diaphragm holder and provided with an inwardly extending flange engaging the diaphragm adjacent the periphery thereof and securing the said diaphragm on its seat, said annular and conical flanges forming an annular fluid space tapered radially from the casing to the space between the annular flange and the said lip.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HELGE SVEN ALBERT RYDBERG.

Witnesses:

FRED FLERON,
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