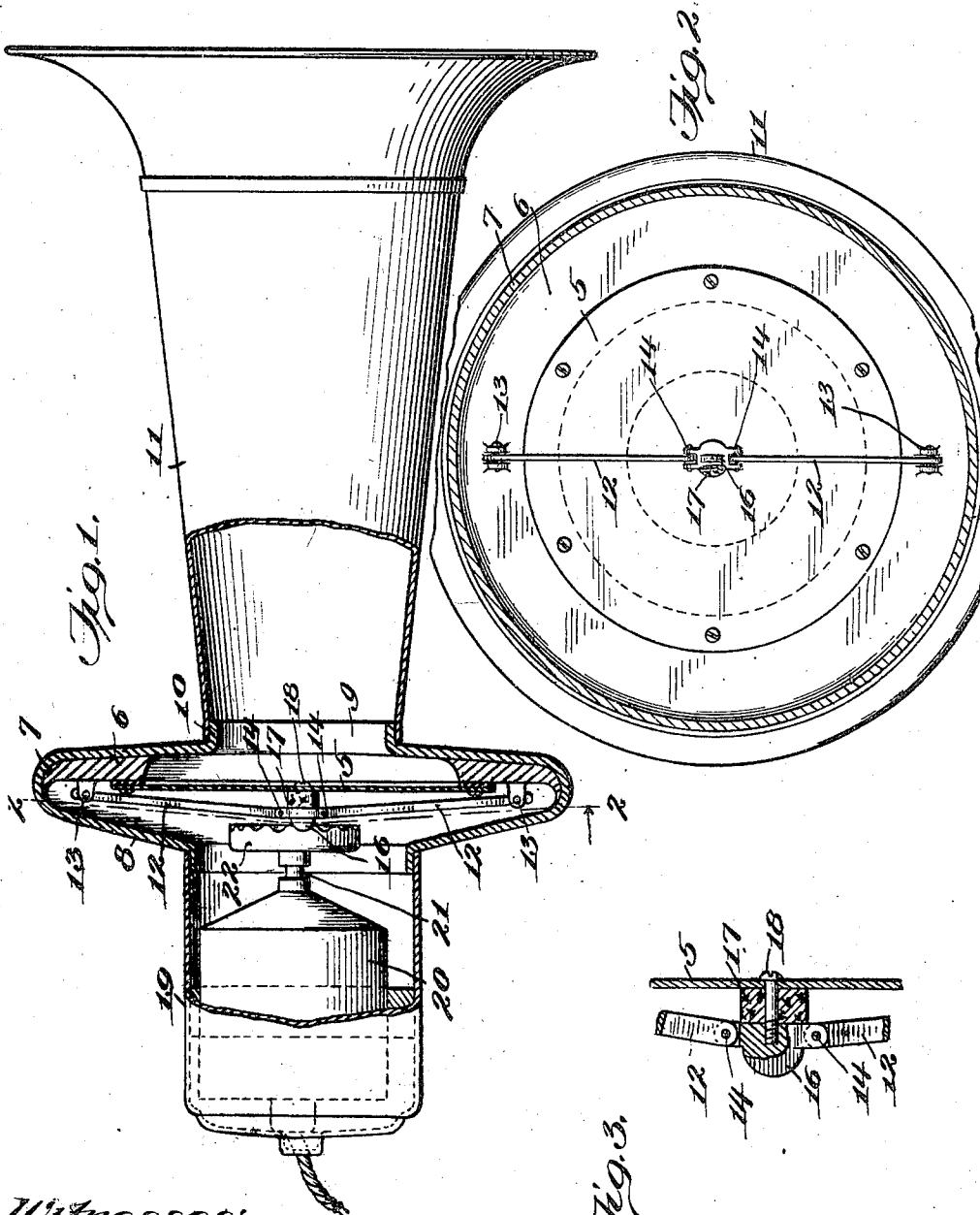


E. RUBES.
ACOUSTIC APPARATUS.
APPLICATION FILED MAR. 5, 1912.

1,059,769.

Patented Apr. 22, 1913.

2 SHEETS-SHEET 1.



Witnesses:
E. H. Hader

Chas. S. Hoyer

Fig. 3.

Inventor:
Ernest Rubes

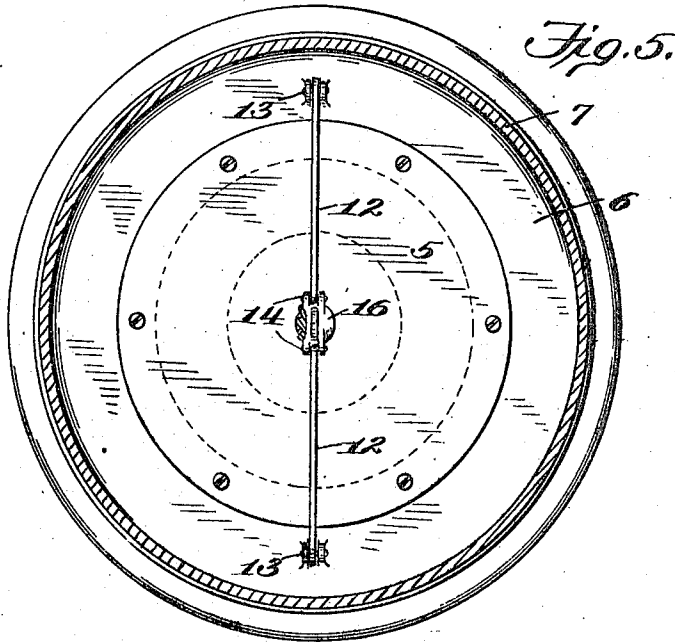
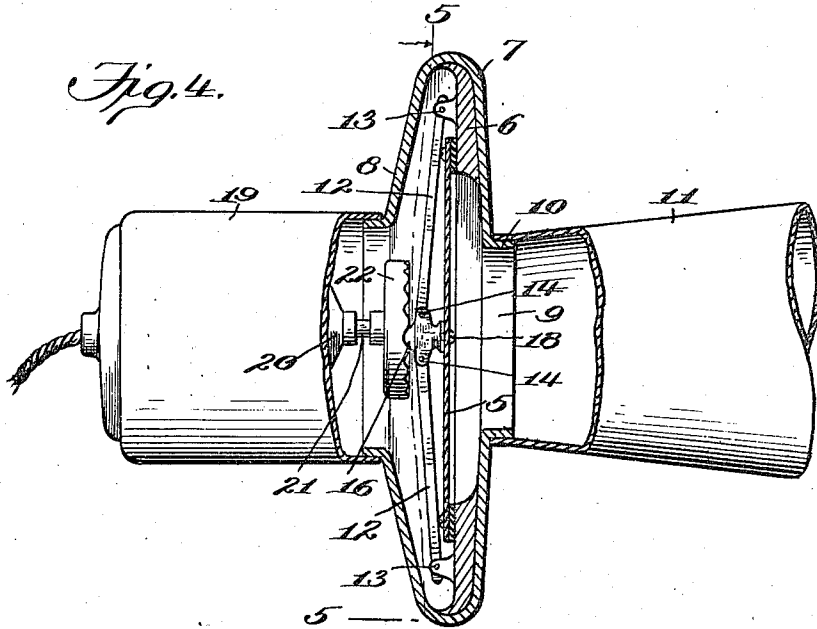
by James L. Norris, Jr.
Att'y.

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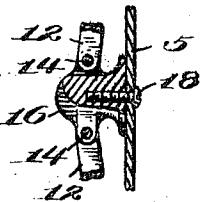
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2 SHEETS-SHEET 2.



Witnesses: *Fig. 6.*
Chas. S. Hoyer



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UNITED STATES PATENT OFFICE.

ERNEST RUBES, OF BROOKLYN, NEW YORK.

ACOUSTIC APPARATUS.

1,059,769.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed March 5, 1912. Serial No. 681,773.

To all whom it may concern:

Be it known that I, ERNEST RUBES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Acoustic Apparatus, of which the following is a specification.

This invention relates to acoustic apparatus and particularly warning signals such as are used on automobiles, motor boats and the like.

The primary object of the invention is to render the main vibrating element or diaphragm more durable and at the same time insure proper vibration of the diaphragm. In warning signals or signaling devices of this class as now commonly employed, the main vibrating element or diaphragm is directly engaged and forcibly and rapidly displaced by the means for vibrating the same, and as a consequence such diaphragm soon becomes ruptured and buckled. These disadvantages incident to the commonly employed form of signal are due to the fact that the entire force utilized for vibrating the diaphragm is directly imposed on the effective face of the diaphragm. The structure embodying the features of the present invention overcomes these disadvantages by interposing yielding means between the projection, vibrating member and the case.

The invention consists in the construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the drawing: Figure 1 is a sectional elevation of an acoustic apparatus or warning signal embodying the features of the invention. Fig. 2 is a transverse vertical section on the line 2—2, Fig. 1. Fig. 3 is an enlarged detail sectional elevation showing the manner of connecting the projection and vibrating member by pivoted yielding means to the casing. Fig. 4 is a view similar to Fig. 1 showing a modification. Fig. 5 is a transverse section on the line 5—5, Fig. 4. Fig. 6 is an enlarged detail sectional elevation similar to Fig. 3 showing the modification.

The present invention embodies improvements on the inventions disclosed by my application Serial Nos. 630,598 and 651,389, filed respectively June 1, 1911, and September 26, 1911.

Referring to Figs. 1, 2 and 3 of the drawing, the numeral 5 designates a diaphragm

or vibrating plate of the type usually employed in devices of this class and preferably secured to an offset portion or ledge 6 of a rim 7 constituting part of an inclosing casing 8 for the apparatus and having a central enlarged opening 9 surrounded by a flange 10 to which the inner end of a suitable resonator 11 is applied. At a suitable distance in rear of the diaphragm 5 a plurality of resilient arms 12 is secured to the ledge 6, two of these arms being shown and pivotally attached at their opposite ends, as at 13 and 14, respectively to the said ledge or portions of the latter and to a diaphragm vibrating auxiliary or a rearwardly extending projection 16. The arms 12, however, may be of any number, it only being necessary to have the arms free for movement with the projection 16 through their pivotal connection to the latter and also yielding or resilient to relieve the diaphragm 5 of direct pulling strain in a manner which will be more fully hereinafter specified. Between the diaphragm 5 and the projection 16 is a washer 17 secured to the said disk and diaphragm by a screw or analogous device 18. This washer 17 will be constructed of any suitable sound absorbing material, such as cork, and the object of the same is to prevent the transmission of harsh rattling sounds or stridulations through the resonator 11 by the action of the vibrating device on the projection 16. The rear section 19 of the casing as shown is in the form of a cylindrical extension in which a suitable electric motor 20 is mounted and secured in any preferred manner, the said motor having its armature shaft 21 projected forwardly and provided with a rotary toothed disk or vibrating device 22 which is held in continual contact with the projection 16.

In Figs. 4, 5 and 6 practically the same features are embodied and, like reference characters are used to indicate similar parts as in Figs. 1, 2 and 3. The sound absorbing device or washer 17 is omitted in the modified structure, the projection 16 in this instance being directly secured to the vibrating member or diaphragm 5.

In the operation of the improved device it will be understood that the motor is supplied with electric current from a suitable source of generation, and the armature shaft 21 rapidly rotated to set up a corresponding rotary action of the disk 22, and the teeth of the latter being in contact with the pro-

jection 16 will cause the diaphragm 5 to be rapidly displaced, the vibration of the diaphragm being accomplished through the projection 16 and washer 17. This operation of the diaphragm will generate alarm notes or sounds, and owing to the presence and association of the movably mounted yielding arms 12 with the projection 16, lateral pulling strain will be prevented from being imposed directly on the diaphragm. The arms 12 coact or harmonize with the vibrations of the diaphragm with material advantage in the sound emitted by the resonator, and the wear and tear of the sound producing parts of the apparatus are reduced to a minimum, and rupture and buckling of the diaphragm are prevented. By the interposition of the sound absorbing means or washer 17 between the diaphragm 5 and the projection 16, harsh metallic rattling sounds or stridulations will be eliminated and the tone of the sounds or signal given forth by the apparatus will be soft and pleasing to the ear, but at the same time sufficiently distinct to be effective as an alarm.

The interposition of the pivoted arms 12 between the projection 16 and the casing irrespective of the sound absorbing washer 17 is the all important feature of the invention, and when the several parts including the vibrating member or diaphragm 5 are connected up or operatively associated, the projection is reinforced against breakage and a yielding movement ensues which relieves the projection of undue strain as the diaphragm, projection and arms move uniformly when subjected to vibrating stress and shocks and injurious pulsations are taken up by the arms. The projection is practically pivoted to the casing and connected to the diaphragm in both forms and all the parts move together and the arms counteract to prevent injury to the diaphragm and projection by the action of the rotary disk 22.

The several parts of the apparatus are simple in their construction and may be readily associated, and changes in the proportions, dimensions and minor details may be adopted without departing from the spirit of the invention.

What is claimed is:

1. In an acoustic apparatus of the class specified, an inclosing casing, a resonator secured thereto, a diaphragm mounted in the casing, a projection secured to and extending inwardly from the diaphragm, a plu-

ality of resilient arms extending radially with relation to the diaphragm and pivoted at their outer and inner ends respectively to the casing and to the projection, the arms acting as a protective means for the diaphragm in different directions to relieve the diaphragm of injurious strain and to reinforce the projection in opposite directions against breakage, and means engaging the projection to set up a vibration of the diaphragm.

2. In an acoustic apparatus, an inclosing casing, a diaphragm mounted in the casing, a projection secured to the diaphragm, a plurality of resilient arms extending radially over the diaphragm and pivoted to the casing and to the projection, and means engaging the projection to set up a vibration of the diaphragm.

3. In an acoustic apparatus of the class specified, an inclosing casing, a resonator secured thereto, a diaphragm mounted in the casing, a resilient means pivotally secured to the casing, a projection attached to the resilient means for vibrating the diaphragm, a sound absorbing means interposed between the diaphragm and the projection and secured to the projection, and means engaging the projection to set up a vibration of the diaphragm.

4. In an acoustic apparatus of the class specified, an inclosing casing, a resonator secured thereto, a disk carrying a projection, resilient arms pivotally connected to the disk and the casing, a sound absorbing means interposed between the diaphragm and the disk and secured to the latter, and rotary means directly engaging the projection of the disk to set up a vibration of the diaphragm.

5. In an acoustic apparatus of the class specified, a diaphragm, an inclosing casing therefor having a resonator, a disk carrying a projection, resilient elements pivotally connected to the disk and the casing and supporting the disk close to the center of the diaphragm, sound absorbing means interposed between the disk and diaphragm, and means directly engaging the projection on the disk for causing a rapid displacement or vibration of the diaphragm.

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

ERNEST RUBES.

Witnesses:

ISAAC BROWN,

JOHN F. CLEVELAND.