Feb. 19, 1929. 1,702,434

C. R. HANNA

SIGNAL TRANSLATING DEVICE

Filed July 24, 1925

Fig. 1.

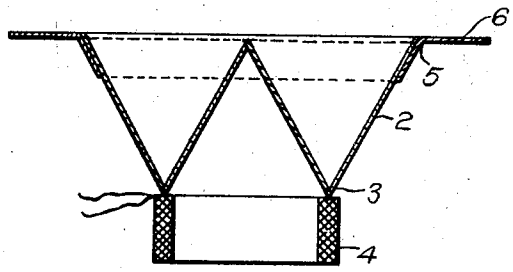
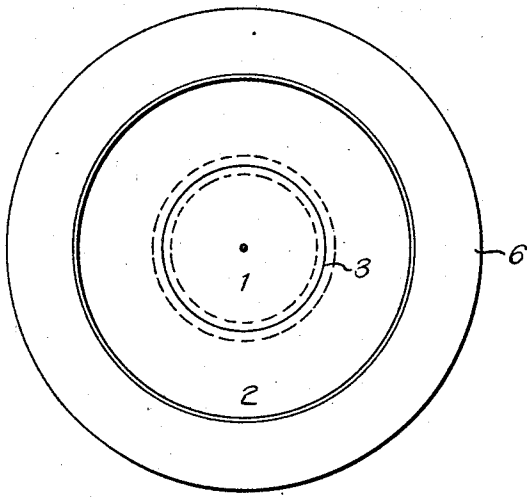


Fig. 2.



WITNESSES:

Alf Schiefelbein,

W. H. Whittemore

INVENTOR

Clinton R. Hanna.

BY

Wesley G. Carr

ATTORNEY

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UNITED STATES PATENT OFFICE.

CLINTON R. HANNA, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

SIGNAL TRANSLATING DEVICE.

Application filed July 24, 1925. Serial No. 45,740.

This invention relates to signal translating devices of the type in which the diaphragm is substantially conical.

It is an object of this invention to provide a diaphragm having the advantages of a conical diaphragm without its space requirements.

It is a further object of this invention to provide a diaphragm having an edge, intermediate the center and margin, along which an actuating element may be secured.

It is a further object of this invention to provide a diaphragm of a form that will present an arch or truss action to the thrust of the actuating element.

Other objects of this invention and details of construction will be evident from the following description and the accompanying drawing, in which

Figure 1 is a diametrical section, and

Fig. 2 is a top plan view.

The diaphragm is of paper or other light, stiff material. It consists of a central conical part 1, surrounded by a portion 2 in the form of a frustrum of a cone, which flares in the opposite direction. The parts 1 and 2 meet in an edge 3 to which a coil 4 is cemented, or otherwise secured.

The margin of the diaphragm is secured, as shown at 5, to an annular support 6 of kid, or other flexible material, by means of which the diaphragm and coil are held in place. Preferably, the kid is loose enough and flexible enough to exert no substantial restoring force upon the diaphragm and coil. The moving system is, therefore, subject to no reaction, except that which results from inertia or from the electrodynamic reaction.

In a microphone, the diaphragm actuates the coil. In a telephone receiver or loud speaker, the coil actuates the diaphragm. In either case, the work is done by forces acting through the edge 3. When the action between the coil and the diaphragm consists of a thrust toward the top of Fig. 1, the surfaces 1 and 2 act like the sides of an arch to stiffen the diaphragm. Consequently, the diaphragm moves as a whole, without being sensibly distorted by such thrust. When the force is downward, in Fig. 1, the tendency of the central cone to become less flat is opposed by the tendency of the outer cone to become less flat also, and the two, acting against one another like the members of a truss, constitute, as a whole, a rigid structure which is moved more easily than it is distorted.

I claim as my invention:

1. In a signal-translating device, a diaphragm comprising two intersecting surfaces, and energy-translating means attached to said diaphragm only along the intersection of said surfaces.

2. In a signal-translating device, a diaphragm comprising two intersecting conical surfaces, and a coil attached to the diaphragm throughout the intersection of said surfaces.

3. In a signal-translating device, an annular flexible support, a diaphragm carried thereby and having an edge defined by two intersecting conical surfaces outside the plane of said support, and a coil secured along said edge.

4. A diaphragm comprising a conical surface terminating in an open end to form an edge within its margin, an open-end conical surface secured along its free edge to said first named edge, and means along said common edge whereby said diaphragm may be agitated.

5. A diaphragm having an edge defined by two intersecting conical surfaces within its margin, and means along said edge whereby said diaphragm may be agitated.

6. As an article of manufacture, a diaphragm comprising a substantially conical base portion and an open ended reentrant apex portion, and having an energy-translating device affixed thereto along the edge defined by said reentrant portion.

7. As an article of manufacture, a diaphragm comprising a substantially conical base portion and a reentrant apex portion, and having a coil secured thereto along the edge defined by said reentrant portion.

In testimony whereof, I have hereunto subscribed my name this first day of July, 1925.

CLINTON R. HANNA.