March 16, 1937. F. KOCH 2,074,266

ACOUSTIC WARNING DEVICE

Filed Aug. 15, 1933

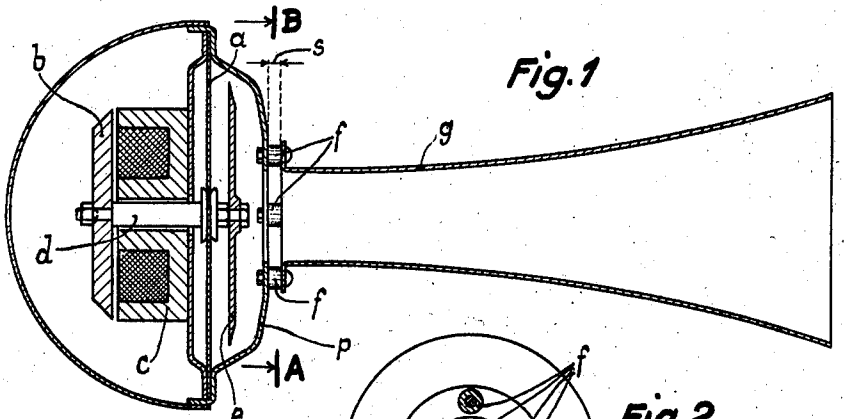


Fig. 1

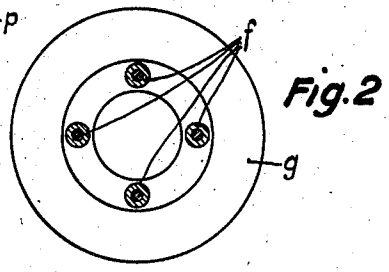


Fig. 2

Inventor
Fritz Koch
by Stewart & McKay
his attorneys

Patented Mar. 16, 1937 2,074,266

UNITED STATES PATENT OFFICE

2,074,266

ACOUSTIC WARNING DEVICE

Fritz Koch, St. Ouen-sur-Seine, France, assignor to Robert Bosch Aktiengesellschaft, Stuttgart, Germany

Application August 15, 1933, Serial No. 685,271
In Germany September 30, 1932

3 Claims. (Cl. 177—7)

The present invention relates to acoustic warning devices, more particularly intended for vehicles, in which the sound is produced by a diaphragm set in rapid vibration and then amplified by an amplifying acoustic conduit such as a horn, trumpet or the like situated in front of this diaphragm.

In such warning apparatus sometimes the oscillations arising on the one hand from the diaphragm and on the other hand from the column of air in movement in the acoustic conduit reciprocally influence each other. This takes place more especially in an undesirable manner when the acoustic conduit is of such proportions that its volume of air assumes a very marked proper or natural period of vibration, for example, when its length and its diameter are in a definite proportion. Owing to the fact that this period of proper oscillations may change, for example, under the influence of atmospheric conditions, such a warning apparatus easily gets out of tune by an atmospheric change; similarly, the adjustment of the tuning of the diaphragm in relation to the acoustic conduit and inversely is rendered more difficult by their reciprocal influence.

These defects are eliminated by the provision of an opening in the commencement of, or at the base of, the acoustic air conduit, which opening communicates with the exterior.

According to the invention the said opening is produced by the means for fastening the acoustic air conduit to the casing of the warning device.

Warning devices constructed in accordance with the invention are shown by way of example in the accompanying drawing, in which:—

Figure 1 is a longitudinal axial section of a warning apparatus.

Figure 2 is a transverse section of the apparatus on the line A—B of Figure 1.

In the construction shown in Figs. 1 and 2, *a* indicates the diaphragm, which is set in vibration by means of the armature *b* of an electromagnet *c* and an interrupter, which is not shown. The armature *b* and the diaphragm *a* are connected by a pin *d*. Furthermore, in this construction, a plate *e* vibrating in unison with the armature and diaphragm is placed on an extension of the pin *d*. This well-known method renders the sound of the warning device more penetrating.

To the wall *p* of the warning apparatus which, in relation to the diaphragm, is remote from the electromagnet, is screwed the base of the acoustic conduit *g*, distance-pieces *f* being interposed. In this manner an annular gap *s* is formed, which is interrupted only by the distance-pieces *f*, and which puts the chamber situated between the diaphragm and the neck of the acoustic conduit *g* into communication with the exterior.

This construction has the advantage that the same means are employed both to fasten the acoustic air conduit to the casing of the device and to provide the opening communicating with the exterior.

It will be understood that this invention is applicable not only to warning apparatus having an electromagnetic action, but also to those which are operated in any other manner, where there is co-ordinated action of a vibrating diaphragm and an amplifying acoustic conduit.

I declare, that what I claim is:

1. An acoustic horn comprising a casing, a diaphragm in said casing, means for vibrating said diaphragm, and an acoustic conduit fastened to said casing by means producing an opening which opens directly into the atmosphere between said casing and said conduit.

2. An acoustic horn comprising a casing, a diaphragm in said casing, means for vibrating said diaphragm, and an acoustic conduit fastened to but spaced from said casing to provide a ring-like opening which opens directly into the atmosphere at the place where the conduit communicates with said casing.

3. An acoustic horn comprising a casing, a diaphragm in said casing, means for vibrating said diaphragm, an acoustic conduit, and means including distance pieces for fastening said conduit to said casing and spacing it therefrom whereby an annular gap which opens directly into the atmosphere is formed between said casing and conduit which is interrupted by said distance pieces.

FRITZ KOCH.