Dec. 26, 1933. C. T. SCHIRMER 1,941,324

SIGNAL DEVICE

Filed April 11, 1931 2 Sheets-Sheet 1

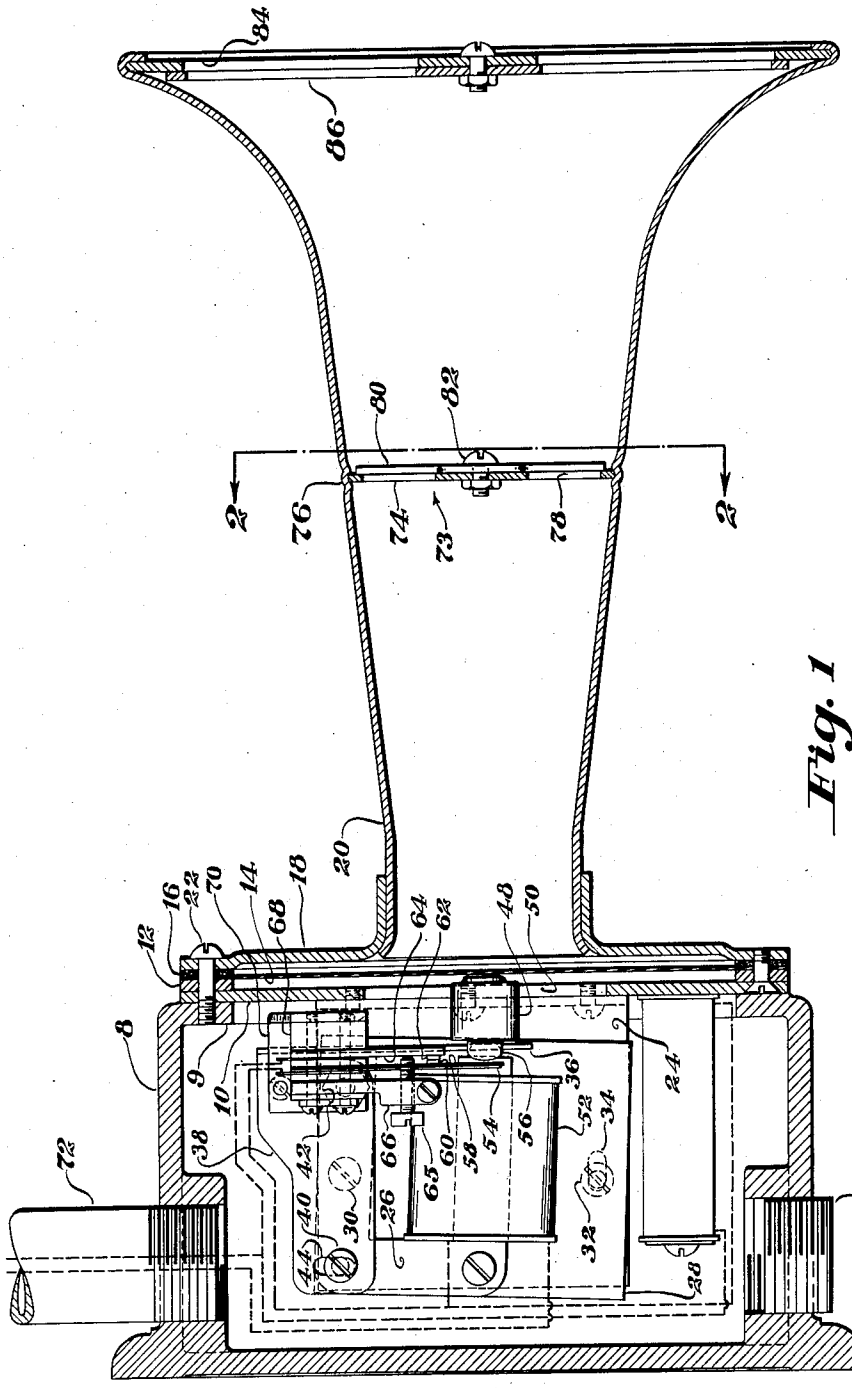


Fig. 1

Witness

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SIGNAL DEVICE

Filed April 11, 1931 2 Sheets-Sheet 2

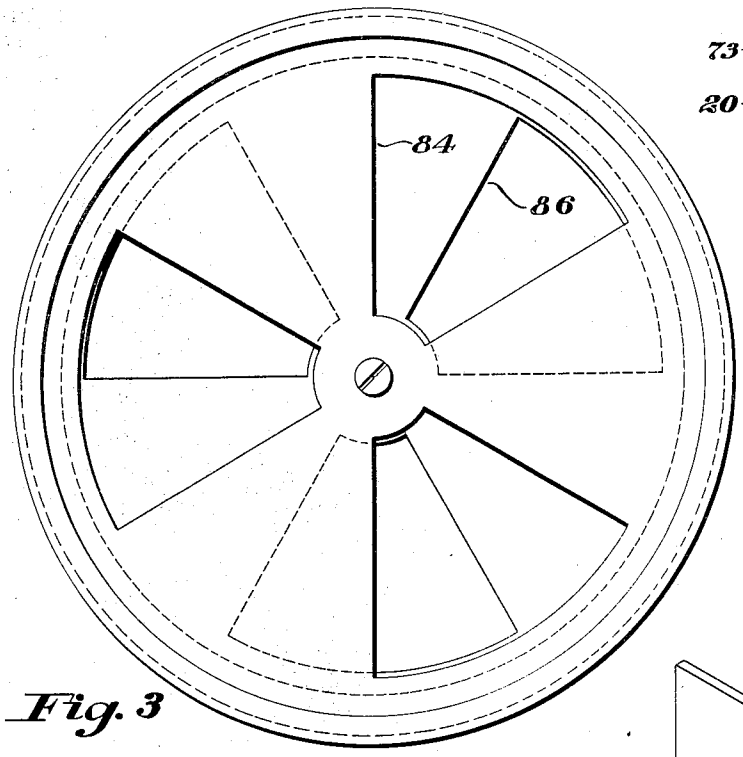


Fig. 3

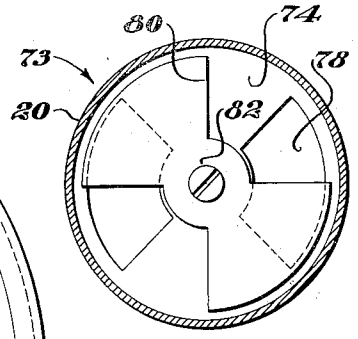


Fig. 2

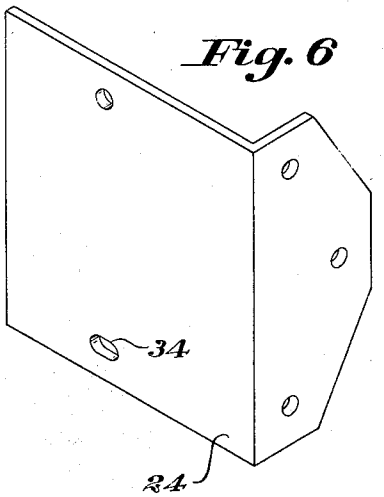


Fig. 6

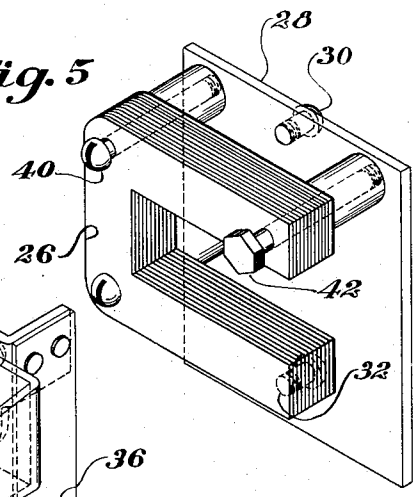


Fig. 5

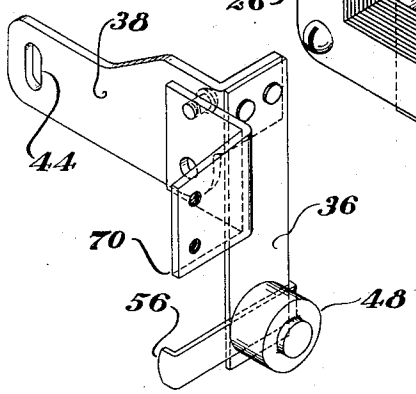


Fig. 4

Witness
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UNITED STATES PATENT OFFICE

1,941,324

SIGNAL DEVICE

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Application April 11, 1931. Serial No. 529,345

4 Claims. (Cl. 116—137)

The present invention relates to signal devices.

The object of the present invention is to provide a signal device capable of convenient adjustment for volume of sound, as well as for its operating characteristics. To this end, the present invention comprises the signal device hereinafter described and particularly defined in the claims.

In the accompanying drawings, Fig. 1 is a sectional elevation of the preferred embodiment of the invention; Fig. 2 is a section on line 2—2 of Fig. 1; Fig. 3 is an end view of the trumpet; and Figs. 4, 5 and 6 are perspective detail views illustrating the adjustment of the operating mechanism.

The illustrated embodiment of the invention comprises a vibrator horn having a heavy casing 8, preferably of cast iron, which houses the vibrator mechanism. Attached to the flange 9 of the casing is a plate 10 which supports the sound generating mechanism. The plate 10 also carries a metal ring 12, a diaphragm 14, a flexible gasket 16, and a trumpet base 18 to which the trumpet 20 is secured. This entire assembly is attached to the flange 9 by screws 22.

The sound generating mechanism comprises an angle bracket 24 attached to the plate 10, and an electromagnet 26 with a laminated core structure supported on and spaced from a plate 28 which is adjustably mounted on the bracket 24. The plate 28 is secured to the bracket by screws 30 and 32, the former acting as pivot for the whole magnet assembly and the latter passing through an elongated opening 34 in the bracket to permit a slight swinging movement about the pivot 30. The magnet has a resilient armature 36 attached to a bracket 38 which in turn is attached to one leg of the magnet by bolts 40 and 42. The bolt 42 passes through an opening in the bracket 38 and the bolt 40 passes through an elongated opening 44 in the bracket to permit pivotal adjustment of the bracket and thereby to adjust the air gap. The armature carries at its free end a hammer 48 which passes through an opening 50 in the plate 10 to strike the diaphragm.

One leg of the magnet core is wound with a coil 52. The current to the coil is periodically interrupted by means of a vibrating contact spring 54 engaged by an arm 56 extending outwardly from the armature, the spring 54 being insulated from the arm by a strip of insulating material 58. The spring has a contact 60 to engage a fixed contact 62 on an arm 64. The electrical contacts are adjusted by a screw 65 mounted in a projecting arm 66, the end of the screw bearing on the arm 64, which has slight resiliency to permit variation of contact pressure. The electrical vibrator assembly is mounted on insulating blocks 68 secured to an angle piece 70 on the bracket 38.

It will be seen that the screw 65 adjusts the electrical contacts and the pivotal mounting of the bracket 38 permits adjustment of the air gap between the magnet and the armature. The mounting of the plate 28 on the bracket 24 permits adjustment of the relation of the hammer to the diaphragm without, however, disturbing either electrical contact adjustment or the magnetic air gap adjustment.

The parts are wired in the usual manner, as indicated in dotted lines in Fig. 1, the wires being led into the casing through a conduit 72 threaded into the casing.

In operation, the hammer is caused to vibrate and to strike rapidly against the diaphragm, emitting a considerable volume of sound through the trumpet.

In order to control the volume of sound, two adjustable dampers are provided. One damper, indicated at 73, is placed internally of the trumpet. It comprises a fixed plate 74 secured in a spun groove 76 of the trumpet, and having a plurality of sectorial openings 78. A movable plate 80 is adjustably secured to the fixed plate by a bolt 82. The movable plate has sectorial wings of such size as either to completely cover the openings 78 in closed position or to leave the openings unobstructed in opening position. The second damper is placed at the mouth of the trumpet and comprises a fixed plate 84 secured by spinning over the edge of the trumpet, and a movable plate 86 mounted in similar fashion to the internal damper.

The horn described above is particularly useful as a signal for fire alarm systems for buildings in that it permits use of one design for all conditions. Thus, in a factory room, where there is considerable noise, the full volume of the horn will be availed of by leaving both dampers open, whereas in an office, where the noise level is low, the full volume is neither necessary nor desirable and the dampers may be partially or completely closed. To reduce the volume, it is preferable first to close the small damper while leaving the large one open, and then to effect further reductions by closing the large damper. The range of volume from wide open to completely shut position is extemely large, permitting use of the horn under any conditions. It has been found that with one damper completely shut and

the other open, the reduction of volume may not be sufficient for some circumstances because the trumpet is apparently permitted to vibrate even though the air waves are shut off from the surrounding atmosphere. With both dampers shut, however, the volume is greatly reduced, not only because of the cutting off of the air waves, but also because of a diminution in the vibration of the trumpet. In order to permit a wide range of sound, it is necessary that no leakage be permitted from the casing or trumpet. The casing is accordingly made of substantial proportions and is completely enclosed. The plate 10 for supporting the vibrating mechanism should be constructed to fit tightly over the flange 8 of the casing. Although several openings may be provided for conduit connections, any openings which are not used are closed by plugs 90 to prevent egress of sound waves.

Having thus described the invention, what is claimed is:

1. A signal device comprising sound generating mechanism, a trumpet, and a plurality of adjustable sound dampers disposed in separated parts of the trumpet, each damper comprising a fixed plate with sectorial openings and a movable plate with sectorial wings, the movable plate being arranged to restrict or close the openings of the fixed plate.

2. A horn comprising a vibrating diaphragm, a vibrator assembly associated with the diaphragm, a trumpet, and a plurality of adjustable sound dampers disposed in separated parts of the trumpet, each damper comprising a fixed plate with sectorial openings and a movable plate with sectorial wings, the movable plate being arranged to restrict or close the openings of the fixed plate.

3. A horn comprising a sound generating mechanism, a trumpet, and a plurality of adjustable sound dampers including one disposed internally of the trumpet and one at the mouth thereof, said dampers acting to control the volume of sound emitted from the trumpet and when closed, to diminish the vibration of the trumpet itself.

4. A horn comprising a sound generating mechanism, a trumpet, and a plurality of adjustable sound dampers including one disposed internally of the trumpet and one at the mouth thereof, each damper comprising a fixed plate with sectorial openings and a movable plate with sectorial wings, the movable plate being arranged to restrict or close the openings of the fixed plate.

CYRUS T. SCHIRMER.