June 10, 1930. A. F. VAN DYCK ET AL 1,763,381

LOUD SPEAKER HORN

Filed Sept. 12, 1925 3 Sheets-Sheet 1

Fig. 1

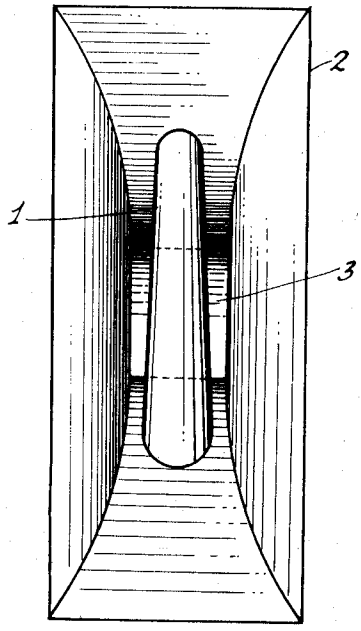
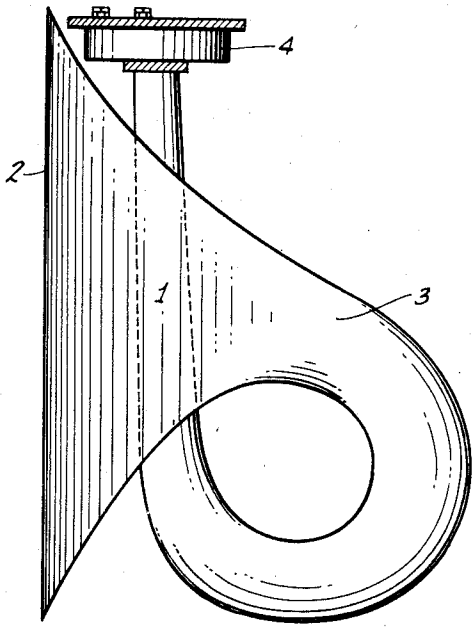


Fig. 2



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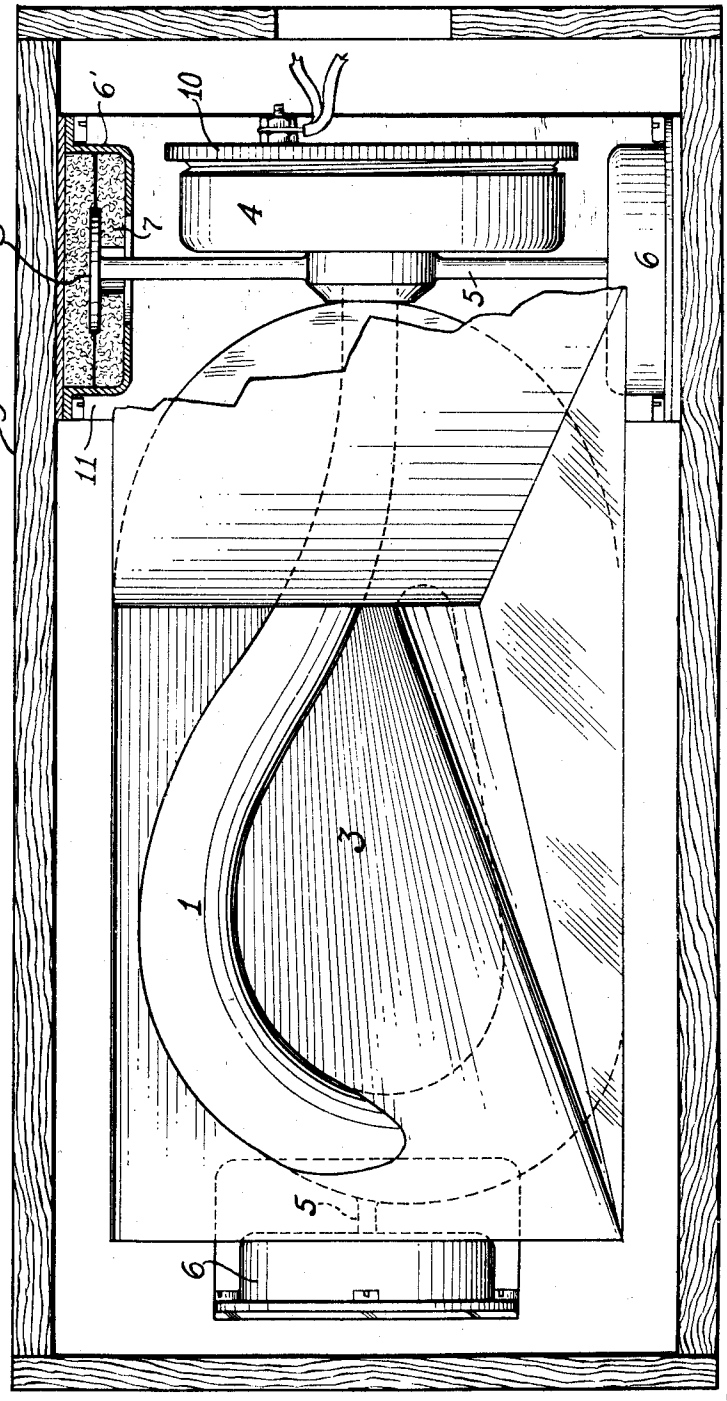

Fig. 3

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LOUD SPEAKER HORN

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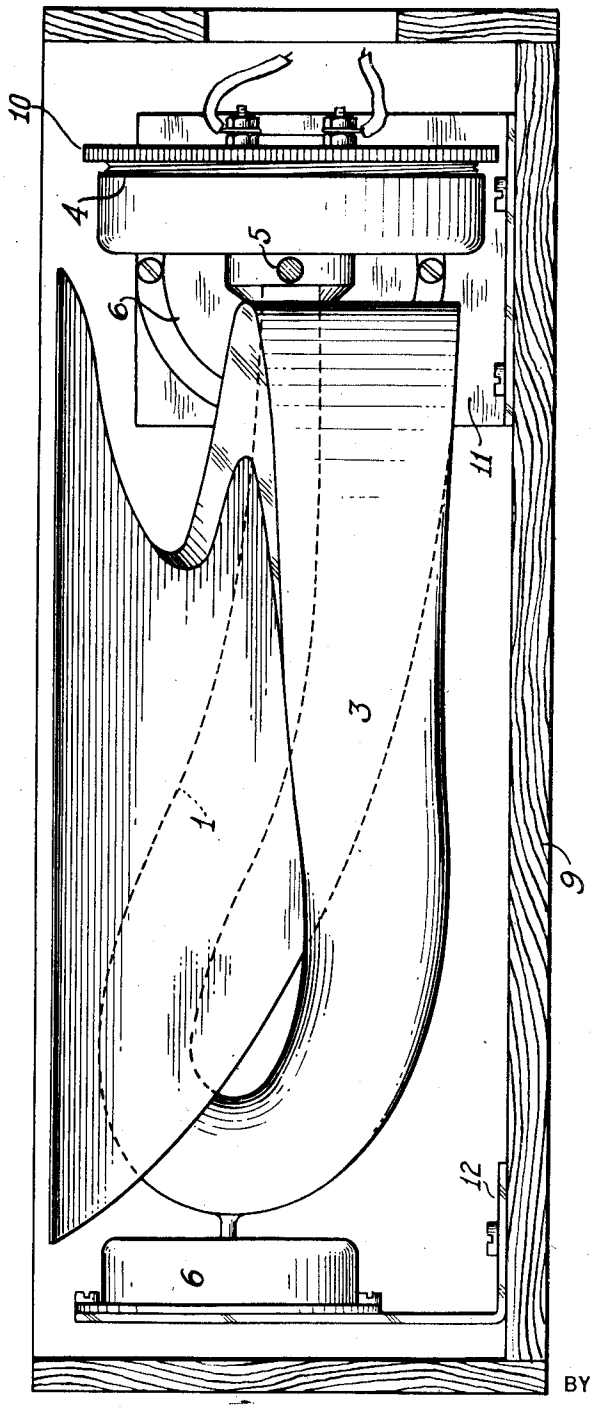

Fig. 4

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UNITED STATES PATENT OFFICE

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LOUD-SPEAKER HORN

Application filed September 12, 1925. Serial No. 55,889.

The object of our invention relates to the compact construction, improved reproduction and perfection of design of "loud speaker horns". It accomplishes this through the use of minimum space and maximum efficiency of a particular apparatus used.

This horn is so constructed that one portion having a smaller cross sectional area passes through another portion or portions having a larger cross sectional area. This crossing may be made through the bell portion of the horn or through any other flared part.

This construction has a great many advantages and features which render it desirable. Wherever compactness of construction is necessary, such as in the use of small portable radio receiving sets, or whenever the advantages of portability are necessary, this arrangement is advantageous. The horn when constructed in this manner may be adapted to occupy a nearly cubical space filling each one of the several corners.

This device also has to do with the mounting of loud speaker horns where compactness of space is essential and rigidity of support in connection with adjustability is necessary. It also has to do with the elimination of reverberation and undesirable acoustical effects from loose or rattling parts.

This construction has also an advantage arising from the extra mechanical stiffening of one part by another passing through it. Vibration of the horn walls is undesirable and its prevention is assisted by the construction described.

Other objects and advantages will appear in connection with the annexed specification, claims and drawing:—

Fig. 1 shows a front view of one embodiment of our invention.

Fig. 2 shows a side view and the location of the coils and reproducer.

Fig. 3 shows a front view of a modification.

Fig. 4 shows a side view with one of the housing sides removed and partly in section.

1 shows the smaller portion of the conducting tube passing through the bell or flared section 2. 3 indicates the throat of the horn. 4 shows an electrical reproducer or other equivalent apparatus for producing sound vibrations. However, we do not consider ourselves limited to this construction but the conducting part 1 may pass through any enlarged part of the conducting tube either in advance or behind in respect to the time at which vibrations pass through it. This arrangement might also be applied to a phonograph, the device 4 being a phonograph reproducer.

In Figs. 3 and 4 the same numerals indicate similar elements of the loud speaker horn. In addition, a novel mounting arrangement is disclosed. Rods 5 indicate supports mounted integral with various parts of a horn. The ends of the supports are enlarged and embedded in sponge rubber or other similar shock absorbing material which is contained within the caps 6, 6′ and 6″.

6′ shows one of the cups in section.

As indicated, 8 is the enlarged portion of shaft 5, which permits of a larger surface of support in the soft material 7. It may be noticed that in this case the horn is supported at three points thereby preventing any stress caused by the particular horn mountings and allowing a natural positioning of the horn with respect to the enclosing casing 9.

10 is an adjusting nut on the telephone unit 4.

The arrangement of the rods 5, 5 adjacent this telephone unit is such that any force supplied in the direction of the motion of the adjusting nut 10 will be easily resisted by this construction without undue stress on any of the parts.

As shown in Figs. 3 and 4, these cups are mounted on the brackets 11 and 12 so as to provide a device which will withstand abuse such as would be the case in light and portable loud speaking devices. It can be seen that the general configuration of the loud speaker horn together with its accessory parts very nearly fill the volume of this box shaped container. It forms a compact unit which it is doubtful could be produced with any other construction. It has been found, after con-

siderable experimenting and research that the acoustical effects are more efficiently and more faithfully reproduced with this particular type of horn construction than with any other type which occupies such small volume and short dimensional space as the one described in this disclosure.

It can be noticed as shown in the figures that the exposed portion of the throat has a variable amount of opening looking from the top to the bottom of the device as shown in Fig. 1 due to the tapering of the tube 1. This variable amount of opening is more or less advantageous in the reproduction of different frequencies of vibration. Also the conducting portion 1 produces certain vibrations, absorptions and resonant effects which are more or less advantageous in this construction. This arrangement can be used for either receiving or transmitting sound vibrations.

Having described our invention, we wish to be limited only by the scope of the claims annexed hereto:

1. A horn having a length greater than its greatest overall dimension consisting of a looped tube intersecting itself, legs attached to the horn for supporting the same and resilient footings for the legs.

2. A horn having a length greater than its greatest overall dimension consisting of a looped tube intersecting itself, a plurality of legs attached to the horn, two of said legs disposed at right angles to each other and resilient footings for the legs.

3. An acoustic device comprising a horn having a length greater than its greatest overall dimension, said horn consisting of a looped tube intersecting itself, a pair of legs rigidly connected to the smaller end of said horn, a third leg connected to said horn at a point between the points of intersection of said horn, said third leg being at right angles to said first mentioned legs, an enlarged portion at the end of each leg, resilient material engaging said enlarged portions, a cabinet for enclosing said horn, a plurality of brackets secured to a part of said housing, and containers secured to said brackets for housing said resilient material.

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