

Aug. 23, 1927.

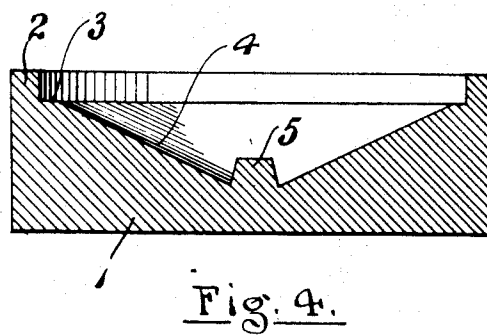
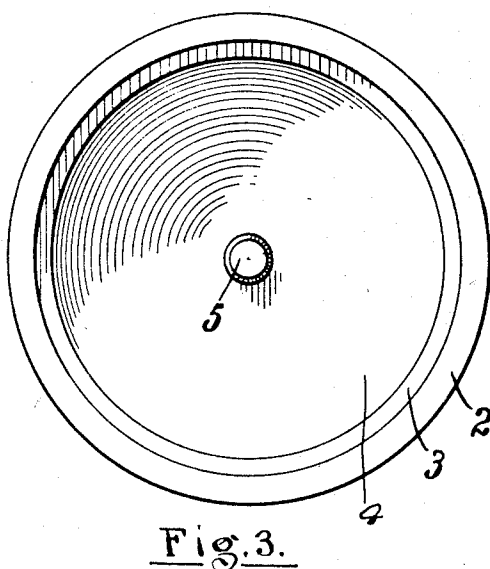
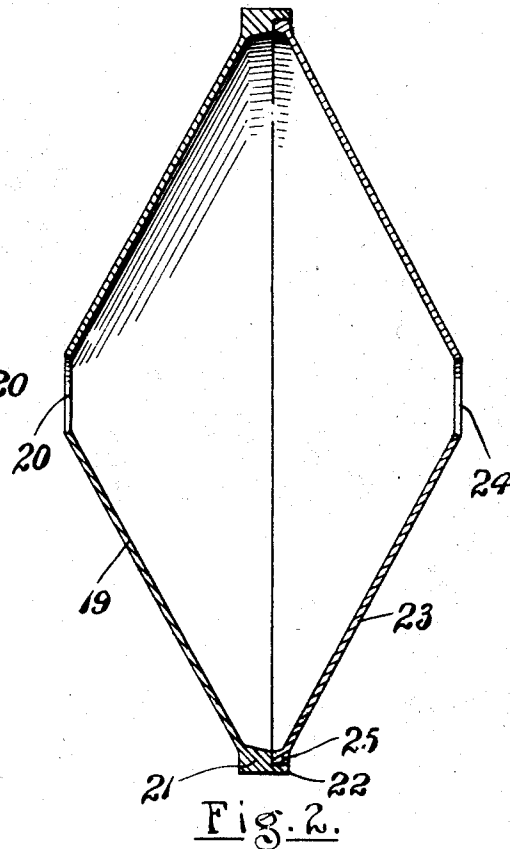
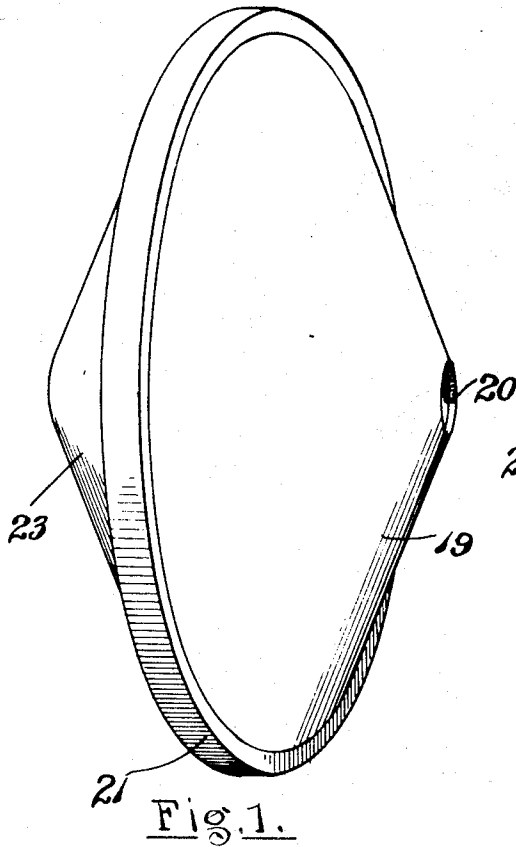
J. KERSTEN

1,639,656

SOUND AMPLIFYING CONSTRUCTION

Filed Dec. 14, 1925

2 Sheets-Sheet 1



Inventor
Jacob Kersten

By Frank E. Liverance, Jr.
Attorney.

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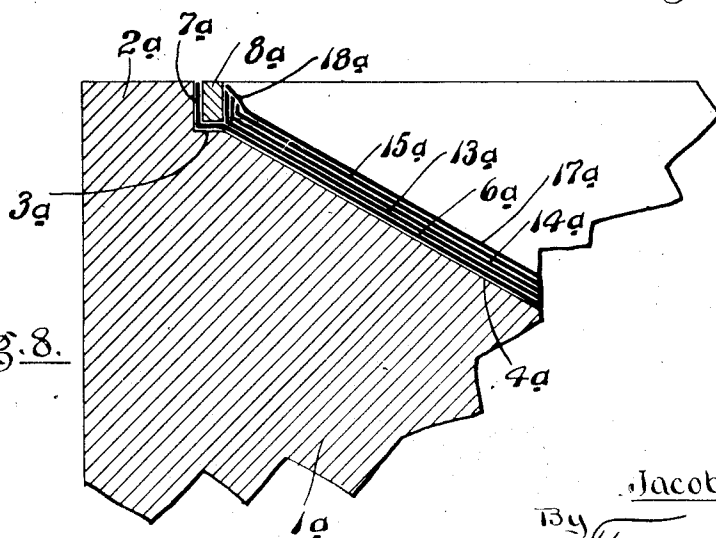
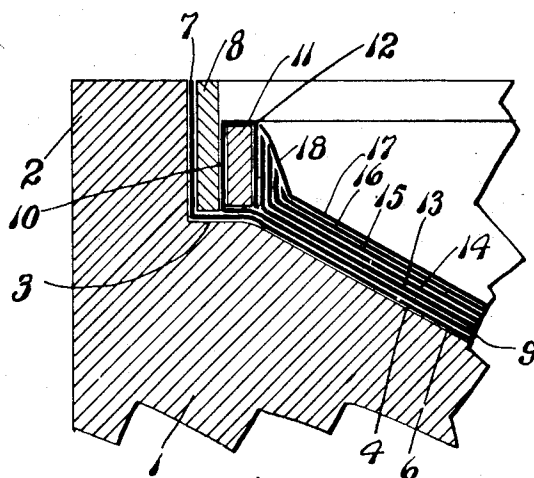
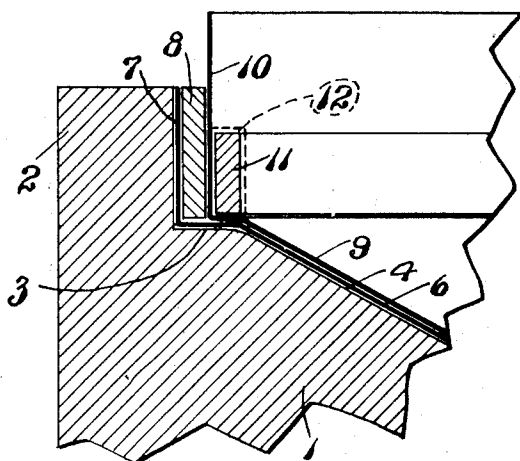
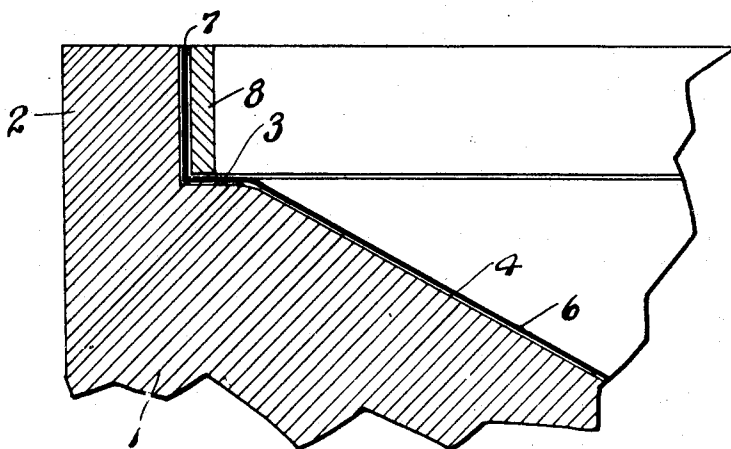
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SOUND AMPLIFYING CONSTRUCTION

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2 Sheets-Sheet 2



Inventor
Jacob Kersten

By Frank E. Liverance, Jr.
Attorney.

UNITED STATES PATENT OFFICE.

JACOB KERSTEN, OF ALLEGAN, MICHIGAN.

SOUND-AMPLIFYING CONSTRUCTION.

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This invention relates to a sound amplifying construction and is primarily concerned with a novel construction and method of making a sound amplifier device from paper, said device being made of two parts and being adapted to be fitted together at their adjoining edges.

It is a primary object and purpose of the present invention to construct each of the two parts or halves of said device of paper in a particularly simple, practical and economical manner and in accordance with a method whereby the same may be constructed by unskilled labor. As a result the parts of the sound amplifying device can be made economically and as a feature of the method of manufacture said parts are held against warping out of shape so that they may be readily fitted together to make a substantially tight fitting where placed together.

To these ends as well as to many others not at this time specifically stated I have made this invention, understanding of which may be had from the following description taken in connection with the accompanying drawings, in which,

Fig. 1 is a perspective view of the sound amplifying construction showing the two parts thereof placed together.

Fig. 2 is a vertical section through the construction shown in Fig. 1.

Fig. 3 is a plan view of the mold used in the construction of one of said parts.

Fig. 4 is a central vertical section through the mold shown in Fig. 3.

Fig. 5 is a fragmentary enlarged vertical section illustrating the first step in the production of one of the parts of the device.

Figs. 6 and 7 are similar views illustrating succeeding steps in the construction of said device, and

Fig. 8 is a view similar to Fig. 7 illustrating the manner of constructing the other part of the device which is interengaged with the first part.

Like reference characters refer to like parts in the different figures of the drawings.

In the production of the device a mold 1 of suitable material is provided in the form of a cylindrical block which, at its upper side, is turned out and recessed, there being left an annular upstanding border or flange 2 around the outer edges of the block which extends downwardly for a short dis-

tance, the inner side thereof coming into conjunction with an inwardly extending annular horizontal shoulder 3, the material being removed from the block at the inner edges of said shoulder portion to make a downwardly and inwardly extending conical recess 4. At the lowest point or apex of this conical recess a small plug 5 is left, the same extending upwardly as shown.

With a mold of this character for the production of one of the parts or edges of the sound amplifying apparatus a sheet of paper 6 is placed in the mold filling the recess 4 and lying against the ledge 3 and having its upper edge turned upwardly to lie against the inner side of the border flange 2, as indicated at 7. It is evident that when this paper is placed in the mold the plug 5 will project upwardly through the paper, making an opening therethrough. After this sheet of paper has been fitted in the mold a closed ring 8 of suitable paper stock is placed inside of the upwardly extending terminal portion 7 of the sheet 6, as shown in Fig. 5. This ring 8 is of a height that its upper edge lies flush with the upper side of the flange 2.

After this has been done a second sheet of paper 9 is placed in the mold and by means of suitable glue or cement securely cemented to the under sheet 6, it at its outer portions being formed to lie over the ledge 3 and then turned upwardly inside of the ring 8, as indicated at 10, but extending a distance above the upper edge of the ring 8, as shown in Fig. 6. A second ring 11 of a diameter so as to fit within the upwardly extending cylindrical portion 10 of the paper is then located above the ledge 3 against said part 10 of the second sheet 9 of paper. This ring is of less height than the ring 8 and the upwardly extending and overhanging portion 10 of the sheet 9 is bent inwardly and then downwardly inside of the ring 11 completely covering the same, as indicated at 12. It is of course understood that whenever these rings 8 or 11 or the sheets of paper placed in the mold are applied the same are suitably treated with glue or cement so that they adhere closely together.

After the sheets 6 and 9 have been thus applied and the rings 8 and 11 put in place, a series of sheets of paper 13, 14, 15 and 16 are superimposed above the second sheet 9 and cemented thereto and to each other, each

at its edge portion passing outwardly along the inner side of the ring 11 but to varying heights. This is clearly shown in Fig. 7. The final sheet of paper 17 which is applied has an edge portion 18 extending to the inner corner of the ring 11 which is covered by the paper 12 thereby covering all of the raw edges of sheets 13 to 16 inclusive, as shown in Fig. 7. Each sheet of paper when applied to the mold has a portion thereof disrupted and forced outward by the plug 5 at the lower central point of the mold. It is of course understood that the application of sheets of paper does not necessarily mean a single continuous sheet, but approximately a single thickness of paper which may be made up of many pieces glued together and possibly overlapping each other to some extent so that the inner surfaces of the mold can be properly fitted.

This completes one-half of the sound amplifying device and when it is removed from the mold it consists of a conical body 19 formed of several thicknesses of paper and with a central opening 20 therethrough at its apex, while at its base or around the edges of the base is a much heavier and thicker rim 21, the same including the rings 8 and 11, and with a single relatively narrow flange 22 projecting therefrom, this flange being the portion of the ring 8 which extends beyond the ring 11. This is fully shown in Fig. 2.

The opposing part or half of the amplifying device is formed in a similar mold except that the annular flange 2^a is of less height and greater width than the flange 2 previously described and the ledge 3^a is narrower than the ledge 3. The conical recess 4^a is substantially the same and it likewise has a central upstanding plug at the apex of the cone. In constructing the other part or half of the device a first thickness of paper 6^a is placed against the mold, fitting against the ledge 3^a and against the inner sides of the flange 2^a, it having the upward extending portion 7^a within said flange 2^a. A ring 8^a is placed above the ledge 3^a flush with the upper edge of the paper 7^a and this part of the device is then completed by several additional thicknesses or sheets of paper 13^a, 14^a, and 15^a applied the same as the sheets, 13, 14, 15 and 16 are applied as previously described, while the final thickness of the paper, 17^a, likewise has an edge portion 18^a covering the raw edges of the paper beneath. These thicknesses of paper and ring 8^a are glued or cemented together and when taken from the mold produce a construction having a wall 23 with an opening 24 at its apex and with a thickened rim 25, the outer diameter of which is of a size that it fits snugly within the flange 22 of the first part of the construction, this being shown fully in Fig. 2.

This sound amplifying device is adapted to receive any suitable horn within it and act similar to a sounding board for amplifying the sound vibrations coming from the horn, the sound vibrations escaping from the device through suitable openings made in one of the sides thereof. The specific construction of the completed device forming no part of the present invention is not shown nor described, the invention in the present instance consisting in the construction of this sounding board portion of the device and method followed in producing the same. The rings 8, 11 and 8^a being of rigid construction and perfectly circular in form before being used in the construction do not twist or warp out of shape but hold the edge portion of each of the two parts or halves of the device in proper shape so that they may be quickly and easily fitted together without gaps or discrepancies in the fitting. Moreover the construction being of paper which is easily manipulated and glued or cemented together it is a very quick and easy operation to make the amplifying device and the cost of production is low. Unskilled labor can handle this work very readily. The molds are of the very simplest form of construction and may be quickly made by turning from a wood block or any other way desired.

The invention has proved very practical and servicable. It is defined in the appended claims and is to be considered as comprehensive of all forms of structure coming within the scope of said claims.

I claim:

1. A device of the character described comprising a conical body having an opening at the apex of the cone, said body being formed of a plurality of laminations of paper cemented together, a circular ring of paper material located at the base of said body and within the outermost of said sheets of paper, and a second circular ring of paper material located within the first ring, the second of the paper sheets forming the body being passed between said rings and thence over and around said second ring, said second ring being of less depth than the first ring, substantially as described.

2. A device of the class described comprising a conical body having an opening at its apex, said body being formed of a plurality of sheets of paper cemented together, and a circular ring of paper material located at the base of said body and between the outer sheet of paper and the next adjacent sheet of paper forming the body, substantially as described.

3. A device of the class described comprising a conical body having an opening at its apex, said body being formed of a plurality of laminations of paper cemented together, and a circular ring of paper stock disposed

at the base of said body, the outermost lamination of paper lying against the outer side of said ring and the remaining sheets of paper, except the innermost, being turned to lie within the inner side of said ring, the innermost lamination of paper at its edge portion being continued over the edges of the intermediate laminations of paper between the innermost and outermost sheet.

4. The method of forming a conical paper amplifying device of the character described, which consists in providing a conical mold having an upwardly extending plug at its central lowermost point, placing a sheet of paper against the sides of said mold with the plug passing therethrough, then placing a circular ring of paper material against the edge portions of said first sheet and cementing the same thereto and thereafter applying a plurality of sheets of paper one over the other above said first sheet and cementing the same together and to said first sheet and turning their edge portions upwardly along the inner sides of said ring, excepting the innermost sheet, its edge portions being passed over the upwardly extending edges of the intermediate sheets of paper between the innermost and outermost sheet.

5. A device of the character described comprising a conical member made of paper and having an opening at its apex, said member at its base having two circular rings one within the other and the inner ring being of less depth than the outer ring, said rings being cemented in place, and a second conical member having an opening at its apex and provided with a single ring of paper stock at its base having a diameter substantially equal to the diameter of the inner ring of

the first member whereby the base of the second member may be received within the flange formed by the projecting portion of the outer ring of the first member where it extends beyond the inner ring, substantially as described.

6. In a device of the character described, two conical members each formed of a plurality of laminations of paper and each at its base being provided with reinforcing rings of paper material cemented to the laminations of paper forming the bodies of said members, the base of one of said members being formed with an annular recess to receive the base of the other member, substantially as described.

7. The method of forming an amplifying device of paper consisting in providing a conical mold formed at its outer portions with a horizontal ledge and an upwardly extending annular flange, placing a sheet of paper within said mold against its conical bottom, said ledge, and against the inner sides of said flange, then placing a circular ring of paper stock over said first sheet of paper above the ledge and against the edge portions of said sheet of paper which lie against the inner side of the flange, and cementing the ring to said paper, and then completing the device by placing and cementing a plurality of laminations of paper in superimposed relation over the first sheet with the edge portions of the said sheets bent upwardly against the inner sides of said ring and cementing the same thereto and to each other.

In testimony whereof I affix my signature.

JACOB KERSTEN.