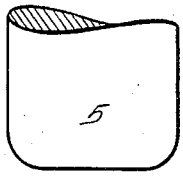
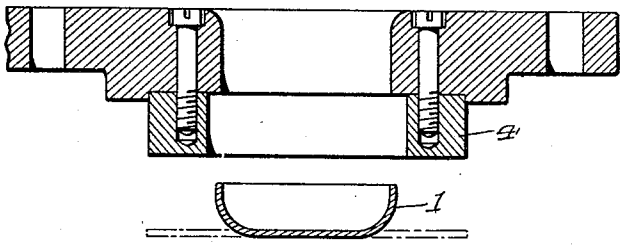
March 18, 1930. F. C. JONES 1,751,002

SHEET METAL HORN ELBOW

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Fig. 1.





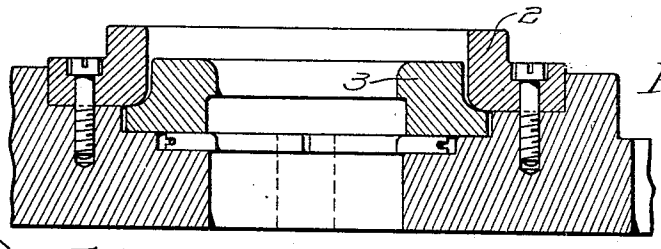


Fig. 2.



Fig. 3.

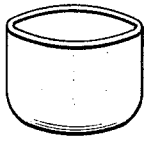


Fig. 4.

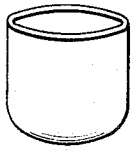


Fig. 5.



Fig. 6.

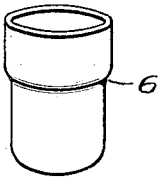


Fig. 7.

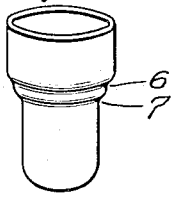


Fig. 8.

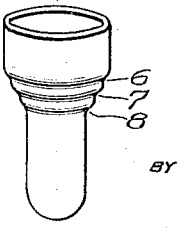


Fig. 9.

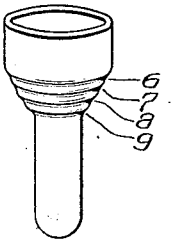


Fig. 10.

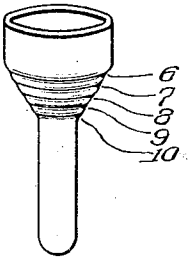
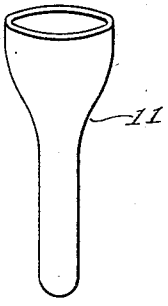


Fig. 11.



INVENTOR
Frederick C. Jones.
BY John W. Myers
ATTORNEY

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Fig. 12.

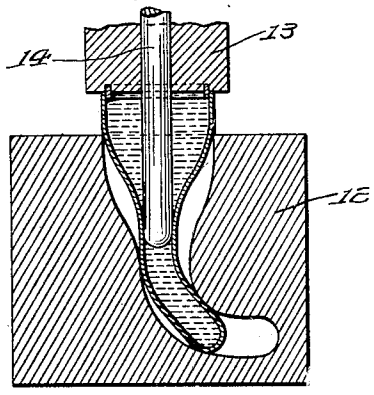


Fig. 13.

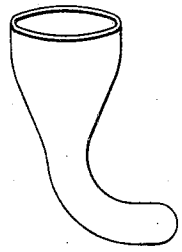


Fig. 14.

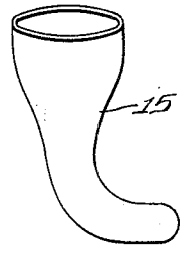


Fig. 15.

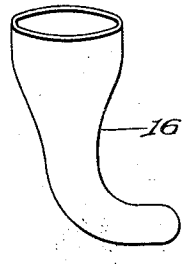


Fig. 16.

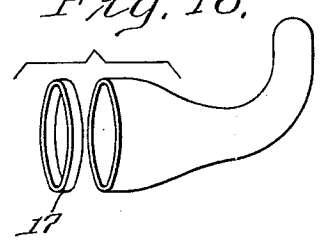


Fig. 17.

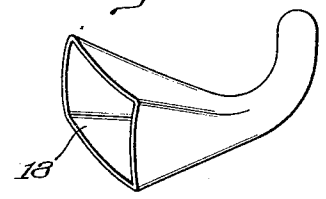


Fig. 18.

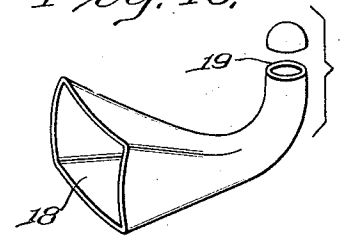
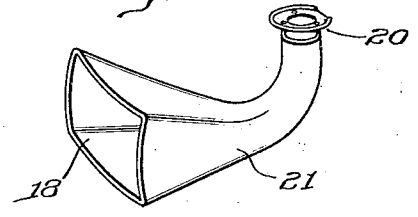


Fig. 19.



INVENTOR
Frederick C. Jones.
BY John D. Miller
ATTORNEY

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Fig. 20.

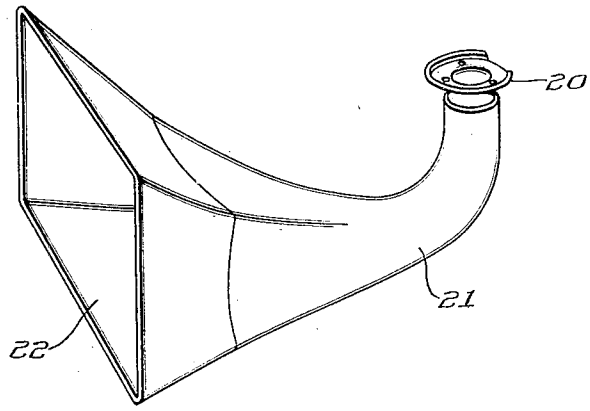
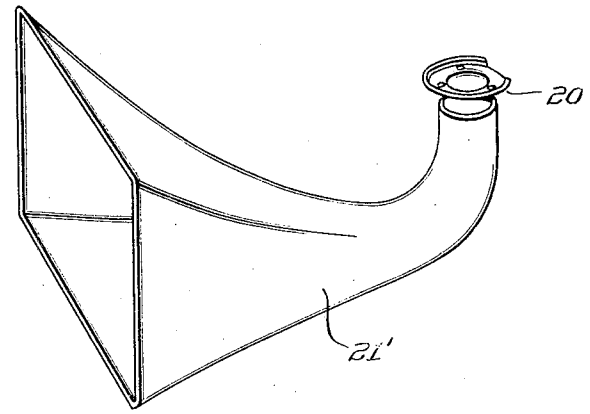


Fig. 21.



INVENTOR
Frederick C. Jones.
BY John D. Myers.
ATTORNEY

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Fig. 22.

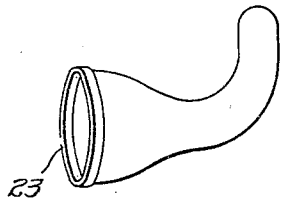


Fig. 24.

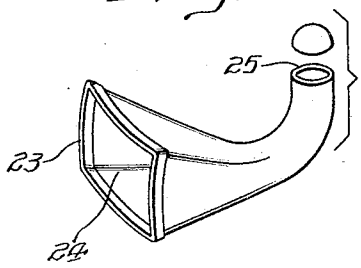


Fig. 23.

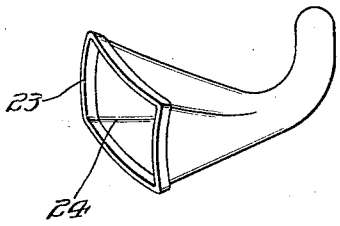


Fig. 25.

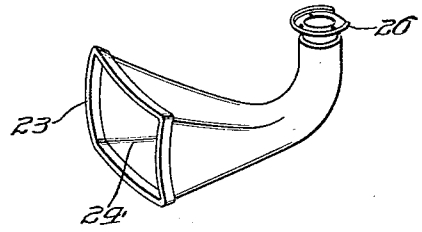


Fig. 26.

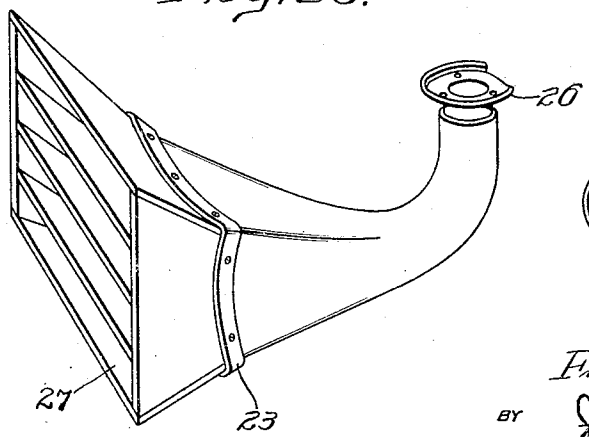
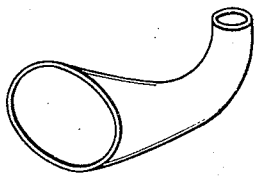


Fig. 27.



INVENTOR

Frederick C. Jones,

BY John D. Myers

ATTORNEY

Patented Mar. 18, 1930

1,751,002

UNITED STATES PATENT OFFICE

FREDERICK C. JONES, OF CAMDEN, NEW JERSEY, ASSIGNOR TO VICTOR TALKING MACHINE COMPANY, A CORPORATION OF NEW JERSEY

SHEET-METAL HORN ELBOW

Application filed August 16, 1924. Serial No. 732,411.

My invention relates to improvements in metallic horn elbows or hollow brackets which form the inner or throat portion of the amplifiers of talking machines of the cabinet type and serve to support the amplifiers within the cabinets thereof, and has for one of its objects to provide an improved seamless sheet metal horn elbow which gives good results in the reproduction of sound in comparison with the heavy casting usually employed and which provides a strong support for the amplifier and at the same time being much lighter than the usual casting is less likely to pull loose from the talking machine cabinet in case the instrument is subjected to severe shock, as, for instance, during transit.

My invention further includes all of the various other novel objects and features of construction and arrangement and steps of manufacture hereinafter specified.

In the accompanying drawings, illustrating one embodiment of the invention and in which similar letters of reference are used to indicate similar parts,

Fig. 1 is a vertical sectional view, partly broken away, indicating the manner of carrying out the first step in the method of forming my improved horn elbow, the blank being shown in dotted lines in its initial form and in full lines in the shallow cup-shaped form resulting from the first drawing operation;

Figs. 2–11 inclusive are perspective views of the blank showing its form after successive redrawing operations;

Fig. 12 is a longitudinal sectional view showing the next form of the blank with its reduced end partially deflected laterally and indicating the manner of effecting this operation;

Figs. 13, 14 and 15 illustrate the form of the blank after successive operations similar to that shown in Fig. 12;

Fig. 16 is a perspective view showing the large end of the blank trimmed off;

Fig. 17 is a similar view of the blank after its large end has been shaped to a substantially rectangular form in cross section;

Fig. 18 is a perspective view of the blank with the smaller or closed end thereof cut off;

Fig. 19 is a perspective view of the completed horn elbow;

Fig. 20 is an enlarged perspective view of a complete amplifier with the bell portion thereof fitted to my improved horn elbow;

Fig. 21 is a similar view showing a modified form of the invention in which the horn elbow and bell portion of the amplifier are formed together in an integral structure;

Figs. 22, 23, 24 and 25 illustrate the blank after successive steps in a modified process in which an attaching flange is formed at the large end of the elbow;

Fig. 26 is an enlarged perspective view of an amplifier embodying the modified form of elbow with attaching flange receiving and secured to a wooden bell portion;

Fig. 27 is a perspective view of another modified form of horn elbow.

In producing a sheet metal horn elbow or hollow bracket in accordance with my invention, a blank, 1, is first formed from a disc of sheet metal and drawn to shallow cup-shaped form, the punching of the disc and the drawing of the blank being effected in a suitable press and preferably taking place in a single operation thereof as indicated in Fig. 1. For instance, the bed of the press carries the annular die, 2, and within and just beneath it the draw ring, 3, while the reciprocating head of the press carries the punch, 4, through which reciprocates the piston, 5. A sheet of suitable metal being laid over the die, the lowering of the head of the press causes the punch to cooperate with the die to stamp out the disc or blank, 1, after which the piston is advanced beyond the punch and within the draw ring for a given distance whereby to carry the blank downwardly within the same and draw it to shallow cup-shaped form.

The blank is then redrawn in cup-shaped form to elongate the same and reduce its diameter, this being accomplished in a suitable number of redrawing operations as indicated in Figs. 2, 3, 4 and 5.

In the next operation the blank is redrawn for a portion of its length only so as to elongate the lower portion of the blank (that is, the portion adjacent its closed end) and reduce the diameter thereof independently of

the upper portion of the blank, and to provide an intermediate annular off-set or peripheral step, 6. The blank is then similarly redrawn in successive operations to further elongate and reduce the lower portion thereof, and to form other offset portions or steps, 7, 8, 9 and 10, as indicated in Figs. 7, 8, 9 and 10 respectively. As a result of these operations the lower or closed end portion of the blank is reduced to substantially tubular form and to much smaller diameter than the upper portion thereof, while the intermediate portion of the blank, being provided with the series of off-sets or steps just described, merges gradually from one diameter to the other. By subjecting the blank to the action of suitable forming dies the series of off-sets or steps is ironed out so that the intermediate portion of the blank is given a continuous smooth taper as indicated at 11 in Fig. 11.

The blank next has its reduced lower end portion bent or deflected laterally with respect to the body of the blank at an angle of approximately 45 degrees, so that the blank assumes the form illustrated in Fig. 12. In carrying out this step the blank in its form shown in Fig. 11 is first filled with suitable fluid such as water and is then inserted in a die or forming block, 12, with its large open end projecting upwardly beyond the same. The die is of the usual two part construction so that the parts may be separated for the convenient insertion or removal of the blank. Above the die is a vertically moving head, 13, through which reciprocates the piston, 14. The head, 13, when moved downwardly impinges against the upper edge of the blank and closes the open end thereof, preventing the water within the blank from escaping. The piston is then moved downwardly beyond the head, 13, and into the blank whereby to exert hydraulic pressure against the inner surface thereof. The head, 13, bears upon the upper end of the blank during this hydraulic action so as to supplement the same in causing the blank to conform to the die and, as it does so, to force the blank downwardly within the die by an endwise thrust. As a result the reduced end portion of the blank is deflected laterally to a certain extent into the angular portion of the die socket.

In the next operation the lower end of the blank is further bent or deflected so as to extend at a greater angle to the body of the blank, say at 90 degrees, as shown in Fig. 13. The angularly-turned lower end of the blank and the intermediate portion thereof are somewhat expanded in the succeeding operation as shown at 15, in Fig. 14, and are then further expanded as shown at 16 in Fig. 15 so as to cause the blank to flare gradually from its closed end towards its open end throughout its entire length or the major portion thereof. These operations indicated in Figs. 13, 14 and 15 are all preferably effected in the same manner as described and illustrated in connection with Fig. 12 and in fact the same apparatus may be used, the pressure exerted on the blank being regulated in each succeeding operation so as to cause the same to assume the different forms illustrated, in which it approaches conformity to the die more closely at each succeeding stage and fully conforms thereto in the stage shown in Fig. 15.

The larger end of the blank is then preferably trimmed off as indicated at 17 in Fig. 16, whereupon the larger end portion or body of the blank is shaped or formed in suitable dies so that it is flattened and substantially rectangular in cross-section as indicated at 18 in Fig. 17.

The closed extremity at the smaller end of the blank is then cut off as indicated at 19 in Fig. 18, so that the angularly turned reduced portion constitutes the neck of the horn elbow, and an attaching member, 20, in the form of a flanged bushing is fixed within the neck, thus completing the process and producing the finished horn elbow, 21.

In using my improved elbow in a talking machine amplifier, a suitable bell portion is fitted to the mouth of the body of the elbow, and may also be formed of sheet metal as shown at 22 in Fig. 20, so that the amplifier is of sheet metal throughout.

If desired the elbow may be extended as indicated at 21′ in Fig. 21 to constitute the bell portion of the amplifier, the two parts being formed as an integral structure by suitably modifying the process above described.

The process may also be modified as illustrated in Figs. 22, 23, 24 and 25. In this instance the operations are the same as heretofore indicated up through the stage shown in Fig. 16. However the larger end of the blank after being trimmed off, is next formed with a flange, 23, as shown in Fig. 22; the operations then continuing as before, the larger end or body of the blank being shaped or formed as at 24, the closed extremity being cut off as at 25 and the attaching member being fixed to the smaller end or neck as at 26. In the completed elbow this flange, 23, receives and overlaps the wooden bell portion, 27, of the amplifier as shown in Fig. 26 and affords convenient means of securing the two parts together.

It is to be understood that the body of the elbow will be shaped to conform to the contour of the particular form of bell portion desired and need not be rectangular in cross-section. For instance, Fig. 27 shows a modified form of elbow in which the larger end is shaped to oval form to fit a similar bell.

It is obvious that various changes may be made in the details of construction and in the carrying out of the process without

departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim and desire to protect by Letters Patent of the United States:

1. A horn elbow or bracket for talking machine amplifiers, comprising a hollow body open at both ends and flared from one end toward the other, and drawn, shaped and made in seamless form from a single continuous piece of sheet metal, and a member provided at one end of the body for attaching the same to a talking machine cabinet to support the elbow.

2. A horn elbow or bracket for talking machine amplifiers, comprising a hollow body open at both ends and flared from one end to the other and having an angularly disposed neck adjacent its smaller end, said body being drawn, shaped and made in seamless form from a single continuous piece of sheet metal, means provided at the smaller end of the body for attaching the same to a talking machine cabinet to support the elbow, and means provided at the other end of the body for coupling thereto and supporting the bell portion of an amplifier.

In testimony whereof, I have signed my name to this specification.

FREDERICK C. JONES.