

A Simple Roll-Type Loud Speaker

Easy and Inexpensive to Construct and Capable of Great Volume

By E. M. YARBROUGH

THE construction of this double-semi-cylinder loud speaker is simplicity itself, as a moment's consideration will show; and the cost of its materials is practically nothing, outside of the unit. It should make an immediate hit with a good many of our readers.—
EDITOR.

OF all loud speakers the writer has ever heard, the double-cylindrical diaphragm now to be described, built on the principle of Dr. de Forest's Audalton, is the most nearly perfect in reproduction. It is also, in contrast with most other paper-diaphragm devices, highly efficient, and absurdly cheap and simple to construct.

Briefly, this reproducer consists of a sheet of heavy paper folded in the middle, with the two halves rolled into semi-cylindrical shape so that the end view is like an "m"; the outer edges being supported, while the center of the crease floats on the diaphragm of a loud-speaker unit. This construction results in a quality of tone realized only by

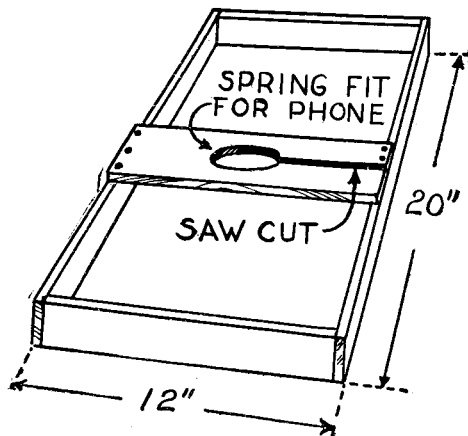


Fig. 2-A. The simple framework upon which the loud speaker is assembled.

the best free-edge cones, with a slight increase in actual volume over horn-type reproduction.

The only materials essential to its construction are a high-grade telephone unit, a cork, and a sheet of heavy art paper, about 20 x 30 inches, such as used for the covers of advertising pamphlets and programs. The latter may be obtained in several shades at any stationery store, or at the local printshop, for about fifteen cents.

CONSTRUCTION IS EASY

Art paper comes with a colored parchment finish on one side. Fold the sheet in the middle by placing one end true with the other and creasing the fold, being sure that the parchment finish is on the *inside*. Fasten the edges together with wire paper-clips about two inches up from each end of the crease, in order to stiffen the crease. Mark the center of the crease and insert it into a knife slit in one end of a long, narrow cork. (See Fig. 1). This cork should be long enough to rest on the diaphragm of the phone without allowing the paper to touch the cap. Cork, being of nearly the same density as paper, makes a much better acoustic link than metal.

Make a light, rectangular, wooden frame, about a foot wide and the length of the crease. (See Fig. 2-A). In the center of the frame, fasten crosspiece to which the phone is to be attached. Mount the phone exactly in the center, using the method of fastening best adapted to the unit. Now tack the free ends of the paper to the side-pieces and set the cork link on the center of the diaphragm. (See Fig. 2-B). The instrument may now be used in a horizontal position with good results.

If it is desired to use the speaker in a vertical position, by standing it on end or hanging it on the wall, the crease must be supported from the end-pieces by light rubber bands, both to give the cork a proper contact with the diaphragm and to prevent sagging of the crease. The diagram makes this clear. If a drop of glue is used to stick the cork to the diaphragm, the tension on the bands need not be great.

FINISHING THE SPEAKER

The ornamentation of the finished product may be as simple or as elaborate as the constructor desires. However, if the result is to be in good taste, it is best to follow the old rule that construction should be ornamental in itself, and ornamentation constructional. Perhaps the best treatment would be to leave the two columns of paper unadorned, thus accenting the beauty of the parchment, and to provide at each end artistic guard rails, as illustrated, matching the style of furniture in the room in which the instrument is to be used. These rails should not touch the membrane. If the paper is used alone, a neat row of inked swastikas may be used at each end.

In order to get the best possible tone from the speaker (assuming of course that the output of the radio amplifier is distortionless) we must eliminate, as far as possible, the distortion arising from the use of a stretched metal diaphragm in the phone unit. The best low-priced units are those in which

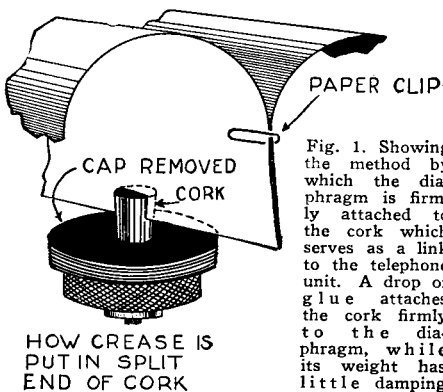
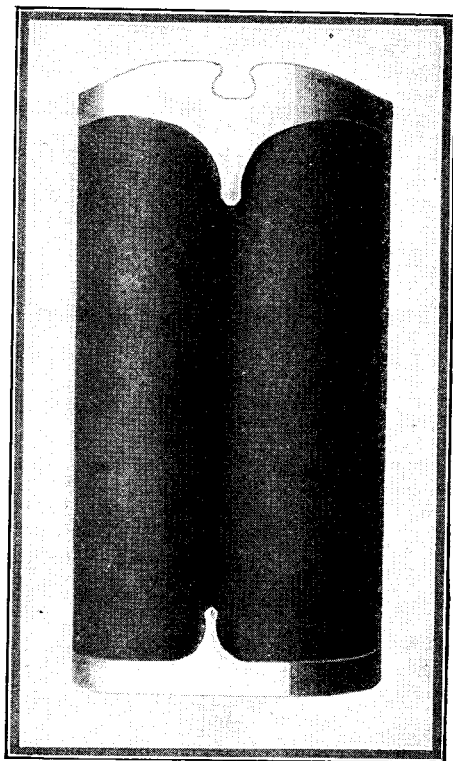


Fig. 1. Showing the method by which the diaphragm is firmly attached to the cork which serves as a link to the telephone unit. A drop of glue attaches the cork firmly to the diaphragm, while its weight has little damping effect.

a large diaphragm is supported between resilient washers, and in which the distance between the magnets and the diaphragm is adjustable. Simply unscrew the cap altogether and adjust the magnets until good tone and volume is had. The cork can now be made very short, resulting in better linkage, and may, if desired, be set on various parts of the diaphragm until the best point is found.

POWERFUL AND COMPACT

The efficiency of conversion by this speaker, of electrical energy into sound energy, is attested by the fact that the resultant sound is as loud and distinct all



One form of decoration by the use of an ornamental guard rail at each end of the diaphragm, if so desired. A very neat effect is thus obtained.

over the room as it is an inch from the membrane. As a result, excessively powerful signals are not necessary for good volume. The writer uses only 66 volts on three "bootleg" 199's in a Roberts Reflex, with a choke coil for the last step. But to hear this outfit talk, you would think that five hundred miles were five, and that "twenty bits" were "twenty bones."

The rectangular construction of this loudspeaker is admirably adapted for portable receivers, for the paper may be made removable from the sides, and folded flat, so that the whole may be packed in the lid of a suitcase. Another stunt is to use a single horizontal cylinder as a combination speaker and dust cover for an open-built

(Continued on page 91)

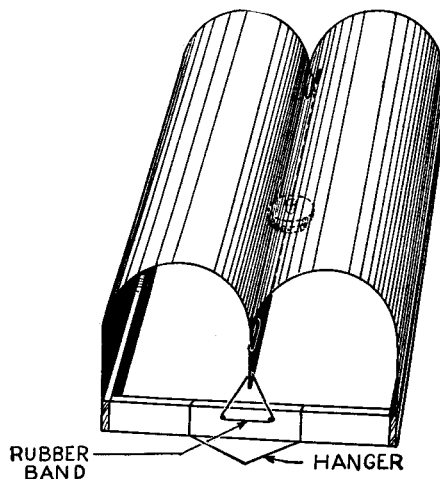


Fig. 2-B. The completed loud speaker, arranged for use on the wall, as viewed from the top. The position of the unit is indicated.

Simple Loud Speaker

(Continued from page 41)

set. A neat, compact outfit is the result. The phone should be mounted on sound-proof pads.

As a final word to those who intend to convert their old phonographs for electrical operation, you will find that the available space within the cabinet is more completely utilized by the double cylinder than by a cone. A speaker of the size described is equivalent to a cone 26 inches in diameter, which would be hard to fit into most cabinets. In the case of the large models, there would be no difficulty involved in fitting a double cylinder, twice this size, into the space now occupied by the records.