

# How to Construct a Six Foot Exponential Horn

(Contributed by a Successful Constructor)



ONE of our readers, a successful constructor, has sent the particulars of a six-foot exponential horn, made originally from the design published in the American journal, "Radio News." He assures us that the speaker is so good that he would like to pass the particulars on to other constructors who might like to try their hands at the speaker.

## Material Required:

1 Sheet 3-Ply, 6ft. 3ft. (Hoopine, approx. 6/6 per sheet).  
About 10ft. of 1 1/2 in. x 1/2 in. (Red Pine, Oregon, etc.).  
One 6in. Square of 1in. thick Wood.  
One 9in. Square of 1in. or 7/8in. thick Wood.  
About 1lb. 3/4 in. 20g. Moulding Nails.  
Glue, Plaster of Paris, about 2oz. 1 1/2 4 Wood Screws.

Draw a pattern full size of each of the shapes shown in Fig. 2. This can be on stout brown paper. To each width given add the thickness of the 3-ply. From the pattern so obtained

draw four of each shape on to the 3-ply sheet, and cut them out. They may be sawn and spoke-shaved to shape, or for those not possessing tools could be cut to shape cheaply at any wood-working shop, the same applying to the other processes to be described.

Accurately mark on each piece the position of the battens. Glue and pin these to the shapes, the top and centre one only, at present. They should be attached overlapping the shape at one side, by slightly less than the thickness of the 3-ply, and on the other overlapping by the thickness of the batten itself. The nails should be driven from the inside, and the points hammered over on the outside. That is for the outside horn.

Place all the four pieces in a row the same way up, and the longer overhanging ends of the battens should all be on the same side—say the right on each shape. Along the same inside edge of each piece make a line the thickness of the 3-ply in from the edge. Apply

two or three coats of shellac to the inside of each piece, taking care to leave the margin marked on each one untouched by the shellac, as this margin is where the adjacent side will butt against the face. The glue to be applied to the joint will not stick to the wood if any shellac is on it.

Treat the sections of the inner horn in the same way, and applying glue to the margin left and the edge of the next section, glue and nail up the four sides. The nails should be about 1in. apart on each edge. The constructor will now have a long slender horn, and if the edges of the shapes have been cut in smooth sweeps, all should be closed up and airtight.

If any gaps appear mix a few drops of liquid glue (seccotine or similar preparation into a stiff paste with a little plaster of paris, and work into any cracks. This will set like cement in an hour or so, and the outside may be sandpapered and shellacked.

THE outer horn may now be joined up. Some assistance will be required for this. By starting at the small end and using screws through the ends of the battens into the end grain of the battens on the adjacent sides it will not prove a difficult task for two pairs of hands. Stop any cracks in the same way as in the case of the inner horn. The inner horn must now be carefully centred in the large one, the large (bottom) end of the small one one inch up from the bottom of outer horn. Wedge in place and prepare four braces 1in. wide of 1/2 in. wood, and four 3in. wide, and by jamming these in radially (see Fig 1 and plan), the inner horn may be rigidly fastened inside the outer. The lengths can only be found by trial.

ter of paris. Glue four more battens round the outside to finish flush with the end of the horn, and screw the 9in. base to these battens (Fig. 1.).

THE unit fits on to the small (upper) end of the inner horn, and the method of fixing it must be devised to suit the unit chosen. A suggestion is made (Fig. 4), which will probably be applicable to most types of unit, and which has been tried successfully.

Bend a piece of thin sheet brass or copper to push lightly on the end of the horn, and solder it up. Fit a piece of

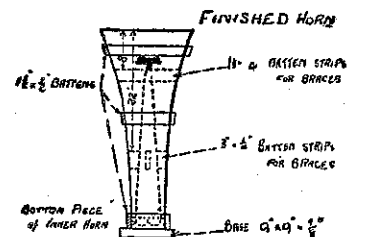
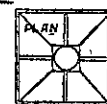
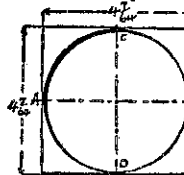


FIG. 1



PLAN OF BOTTOM PIECE OF HORN.



SECTION THRU A-B AND C-D

FIG. 3

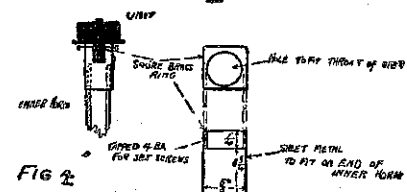


FIG. 2

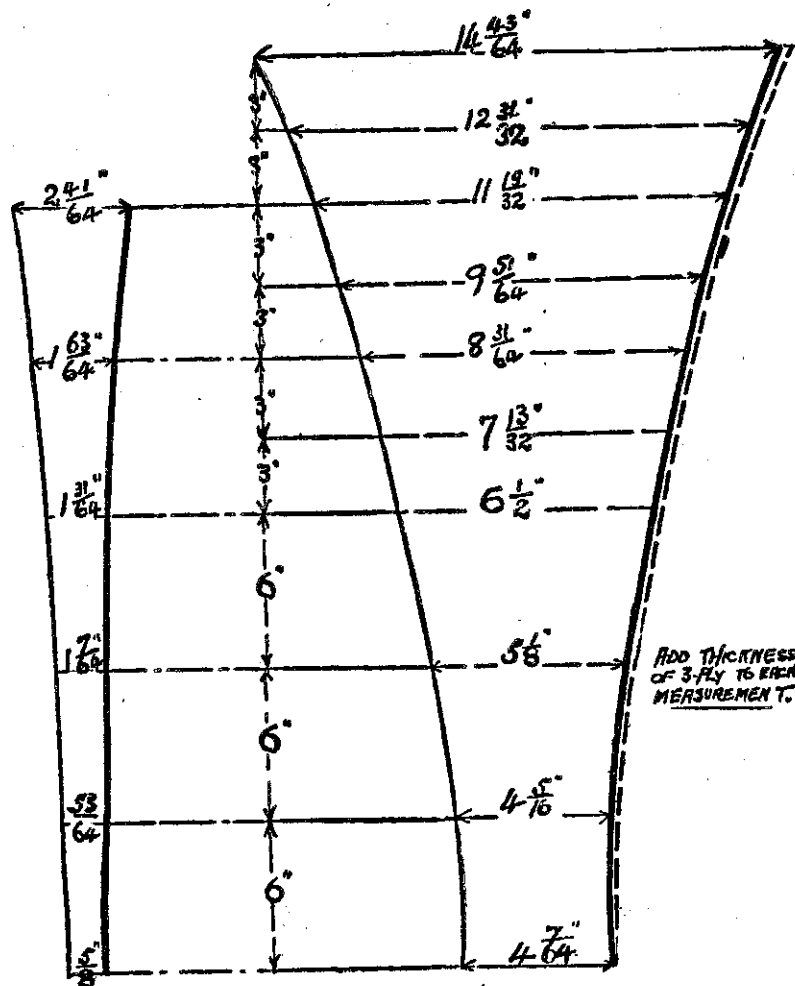


FIG. 2

DIMENSIONS OF HORN SECTIONS

SIZES ARE INSIDE MEASUREMENTS

SO ADD THICKNESS OF 3-PLY TO EACH DIAMETER AND CUT 4 PIECES ALIKE.

## An Empire Programme

THE Prime Minister, Mr. MacDonald, at 9.30 p.m. Friday last, introduced a special programme issued on all stations of the British Broadcasting Corporation in connection with the annual Empire Day celebrations.

During the programme listeners were given an impression in sound of a journey round the Empire. Visits were paid to Canada, Australia, Singapore, India, and South Africa, and ships, trains, aeroplanes, wireless, and other forms of Imperial communications were represented.

The experimental shortwave Empire station 5SW, transmitted this programme, and an attempt was made by 2YA to rebroadcast. It was, however, unsuccessful.

Take the 6in. square of wood and square it down until it fits tightly in the end of the outer horn (4 1/4 in. sq.). If the constructor possesses a lathe this square must now be mounted on the face-plate and recessed to the shape and size indicated in Fig 3 (section). If he has no lathe this must be given to a wood turner. Force this completed square into the horn and glue in position, filling all cracks with plas-

4in. brass sheet lightly into one end. Bore the brass square to fit tightly over the neck of the unit, solder it inside the metal tube, and tap through the sheet metal and brass, say four B.A., for set screws that will tighten it on to the neck of the unit. The unit will now have an adaptor that will push tightly over the end of the inner horn.

The chief concern of the constructor must be to see that the whole horn is airtight and has no loose parts that can vibrate. Should there be any vibration, extra battens may be applied. The outside may be painted or finished in any manner the constructor fancies. A horn has been constructed to these specifications and gives remarkable reproduction, superior to an expensive cone of good make, or horn speaker, and the constructor can be sure that the results will more than repay him for the trouble taken in making up this speaker.