

tion, combined with sensitivity. With a given input, the linen-diaphragm will give rather more volume than will a paper cone. The units will, of course, work well from a larger amplifier than just mentioned, but whilst not giving the full possible volume, it will be more than ample for any ordinary house.

When it becomes necessary to supply dance music to fill a hall, a dynamic cone speaker is the most suitable, as heavy volume is required for dancing, for which an exceptionally heavy unit would be required in a linen-diaphragm speaker. The latter speaker with an ordinary good unit will be found suitable for dancing in the home.

Nothing is gained by increasing the dimensions of the linen-diaphragm speaker over those given. Increased size only means more tension on the diaphragms to get the right effect, and the extra tension may be risky. The speaker as described will reproduce notes well below 50 cycles—as deep as

the baffle to the thickness of the battens. This method of mounting preserves the deep notes and gives them necessary prominence.

#### Free-edge Cone.

THIS, the simplest form of cone-speaker, is quickly made, and gives good results. A 12-inch circle of heavy paper is cut out, a small segment removed, and the two edges glued together. A hole is then made in the centre, through which the spindle is passed, one of the felt-covered washers on either side of the cone. When the nuts are tightened up, the speaker is ready for use if the unit is laid flat on the table. The spindle will hold the cone in place. Suitable means may be devised for hanging the unit on the wall or upon a stand. It may be attached to the ceiling with the cone downwards in a horizontal position. This is a handy method of trying out the unit before the construction of a more complete speaker, but does not bring out the full capabilities of a unit.

A segment of 25 degrees is sufficient to cut from any cone to get the "dished" effect. This is about 30 degrees when overlapped and glued. One cut runs to the centre, but the second cut runs slightly to one side, so that an overlap for glueing continues to the centre. See diagram.

#### Material for Cones.

SHEETS of paper suitable for cones may be purchased, but very few dealers keep it in stock, and it requires careful packing for postage.

Suitable paper, known as "cover paper," may often be obtained from a printer, and if not sufficiently heavy, two sheets may be pasted together. The correct thickness for a large cone would be equal to two thicknesses of the "Listeners' Guide" cover. Dark browns or similar colours are the most suitable. An important point is to choose a "soft" paper rather than one with a hard finish—judge it by shaking a sheet—it should not have much "rattle."

Heavy brown paper is fairly good for the purpose.

When sheets are pasted together they will remain flat if allowed to dry for 24 hours under flat pressure. Drying at a fire or without pressure will result in buckling. A small table turned upsidedown on a larger one makes a good press, but a few sheets of newspaper must be used as a pad to take up unevenness. Have clean paper next to the cone, as the dampness may cause newspaper print to transfer and spoil the appearance.

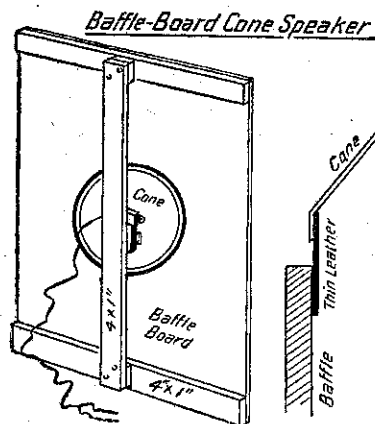
Two or three sheets of newspaper faced up with thin brown or a fancy paper will make good cone material.

The main thing to avoid in cone construction is unsound joints, as these are liable to rattle and give annoyance. If the edges are glued together with secotine as directed in the "Guide," no trouble will be experienced.

#### General.

IT might be said that the manufacture of a loudspeaker as outlined above is the simplest of all radio construction work, especially when the great amount of satisfaction to be derived is taken into consideration. With a good unit ready for use, it is only a matter of a little time and careful hand-work to produce an article that will please the eye as well as the ear.

(Concluded on page 28.)



any pedal organ notes that the writer has encountered on a gramophone record.

It is just as well to mention here that the application of celluloid solution to the linen or silk diaphragm is not intended to result in a celluloid diaphragm in which the fabric is embedded. The dope is only intended to stiffen the fabric sufficiently to take away the "deadness" which it has when used without stiffening. Three coats of thin solution are ample, and thus treated, the diaphragms will give pleasingly mellow reproduction.

#### Baffle-Board Speakers.

ANOTHER successful cone speaker is that in which a cone of small diameter is mounted with a flexible edging or "surround" in a circular hole in the centre of a sheet of heavy three-ply or building-board not less than 2ft. square. A cone 9 inches in diameter is suitable, and the hole in the baffle may be  $\frac{1}{2}$  to  $\frac{3}{4}$  in. larger in diameter. The cone is then connected to the baffle by a one-inch circle of thin chamois leather, or the nearest suitable material procurable—thin india-rubber sheet is good, but perishes in time; a strip of thin serge cut "on the bias," that is diagonally; waterproofed silk is also used. The material must be thin, pliable, and free from "grain." The construction of this type of speaker was described on May 3 last. A one-inch batten is attached to two opposite ends of the baffle; and the unit is supported upon a stout cross-piece joining the two, but standing away from the back of

# RADIO DIRECTORY

## What to Buy and Where

### CITIES

- |   |   |
|---|---|
| <b>AERIAL MASTS</b> .....   | <b>Domestic Radio Co., Ltd.,</b><br>300 Queen Street, Auckland.                                   |
| <b>ALTONA &amp; HAMMARLUND-ROBERTS SETS.</b>  | <b>Johns, Ltd.</b><br>Chancery Street, Auckland.  |
| <b>AMPLION LOUDSPEAKERS</b>   | <b>All Radio Dealers.</b>   |
| <b>BURGESS RADIO BATTERIES,</b>   | <b>All Radio Dealers.</b>   |
| <b>CROSLEY RADIO</b>  | <b>Abel, Smeeton, Ltd.,</b><br>27-29 Customs St. E. Auckland.                                     |
| <b>CROSLEY RADIO RECEIVERS</b>  | <b>G. G. Macquarrie, Ltd.,</b><br>120 Willis Street, Wellington.                                  |
| <b>CROSLEY RADIO</b> .....  | <b>Abel, Smeeton, Ltd. Rep.: G. MOSES,</b><br>James Street, Bangalore.                            |
| <b>DAYTON All-Electric Radio</b> ...  | <b>Superadio, Ltd.,</b><br>147 Queen Street Auckland.   |
| <b>EMMCO RADIO PRODUCTS</b>   | <b>Johns, Ltd.,</b><br>Chancery St. Auckland  |
| <b>EMMCO RADIO PRODUCTS</b>   | <b>Thos. Ballinger &amp; Co., Ltd.,</b><br>Victoria St. Wellington.                               |
| <b>EMMCO RADIO PRODUCTS</b>   | <b>L. B. Scott, Ltd.,</b><br>Worcester St. Christchurch.  |
| <b>KING RADIO RECEIVERS</b> ...   | <b>F. J. W. Fear &amp; Co.,</b><br>63 Willis Street, Wellington.                                  |
| <b>LISSEN RADIO PARTS AND KITS</b> .....  | <b>All Radio Dealers.</b>   |
| <b>LOUDSPEAKER AND TRANSFORMER REPAIRS</b> .....  | <b>A. E. Strange,</b><br>104 Worcester Street Christchurch.                                       |
| <b>MAJESTIC RADIO RECEIVERS</b>   | <b>Kirkcaldie &amp; Stains,</b><br>Chief Wellington Agents, Lambton Quay.                         |
| <b>MULLARD VALVES</b> .....   | <b>All Radio Dealers.</b>   |
| <b>PILOT 1930 PARTS AND KITS, ETC.</b> .....  | <b>Abel, Smeeton, Ltd.,</b><br>27-29 Customs Street East, Auckland.                               |
| <b>PILOT 1930 PARTS—PILOT SUPER WASP KITS, GILFILLAN, KELLOGG and ATWATER KENT SETS</b> ..... | <b>Harrington's, N.Z., Ltd.,</b><br>138-140 Queen St., Auckland.<br>40-42 Willis St., Wellington. |
| <b>RADIOLA RECEIVERS and Expert Radiola Service.</b>  | <b>Farmers' Trading Co., Ltd.,</b><br>Hobson Street Auckland.                                     |
| <b>RADIO REPAIRS AND SERVICE</b> .....  | <b>E. G. Shipley,</b><br>185 Manchester Street, Christchurch.                                     |
| <b>COUNTRY TOWNS</b>  |   |
| <b>CROSLEY RADIO</b> .....  | <b>J. C. Davidson,</b><br>Main Street Pahiatua.   |
| <b>CROSLEY SETS</b> .....   | <b>Abel, Smeeton, Ltd. Rep.: C. Ruscoe,</b><br>409 Devon Street, New Plymouth.                    |
| <b>CROSLEY RADIO</b> .....  | <b>D. A. Morrison &amp; Co.,</b><br>Victoria Avenue Wanganui.                                     |
| <b>MAJESTIC ELECTRIC RADIO</b>  | <b>Berryman's, The Home of Music,</b><br>Palmerston North.  |
| <b>MAJESTIC, ATWATER-KENT AND RADIOLA ELECTRIC SETS</b>                                       | <b>Radio House, Hamilton.</b><br>G. S. Anchor Manager.  |
| <b>PHILIPS VALVES AND APPARATUS</b>   | <b>All Good Radio Dealers.</b>  |