on the trap, and it will be found that the interference is cut out and distant stations come in without a trace of the local. It will be noticed in some cases that the aerial condenser on the receiver has a different reading than when used without the trap. This is due to the effect of another tuned circuit—the aerial lead.

For Use With a Valve Set.

THE next part to be constructed is the connector, for use when using the last one or two valves in the set. Care must be taken to see that all the following connections are made the correct way round. It wouldn't do to say what might happen if a mistake was made, especially if the receiver was earthed as well as the crystal set.

It is assumed that the reader has at least one valve with a burnt-out filament! Break away all the glass and clean the solder from the tips of the pins. A small hole can be seen running down the valve legs, and it is through these that connections are made. About a yard of twin flex is obtained. Clean the wires at each end, and tin the ends to facilitate soldering. Now, look down on the valve base, with the legs underneath, and the pin at the back, push one wire down the plate leg (the right-hand top corner), the other wire, push in the hole of the filament positive leg (the right-hand bottom corner). Take a note of the colours. In some plugs it is quite easy to see which is the tip and which the sleeve connection. (Igranic pacent plug is recommended.) The wire fastened to the plate leg in the valve socket is soldered (soldering is preferable, as no mistakes are made), to the sleeve connection of the plug. The filament positive lead joins on the tip of the plug. If coloured flex is used it is quite simple to follow these instructions. So much for this part of the business.

CONNECT up the crystal set as though the phones were to be used. Now push in the adaptor plug, and take out the detector valve of the big set. In its place insert the adaptor socket. Switch on and listen. The R.F. valves can then be either turned out or taken out of the set all together. If the volume is too much with two audio valve, this adaptor can be plugged into the first audio socket, and have merely one amplifying valve on the crystal.

If, in any of these constructional articles there are any difficulties encountered by the builder, the writer will be pleased to help to make it clearer, and would appreciate any reports of the results of the constructor's efforts.

List of Components Needed
For Combined Crystal and Wave Trap

¼-lb. 20 s.w.g. wire d.c.c.
Strip of celluloid, 10 inches x 6 inches.
1 Variable Condenser, .0005 up.
1 Semi-Permanent Crystal Detector.
1 single filament Jack (Igranic No. 65).
2 Terminals.
1 Choke (or secondary of burnt-out transformer).
1 Condenser, 1 m.f.d.
1 Spring Clip.
Ebonite Panel, 9in. x 6in.
Baseboard, 9in. x 8in.
2 Terminals.

Tips and Jottings

The Pentode Valve.

THE pentode is a five-electrode power-output valve with a high magnification factor, but in which the usual low mutual conductance associated with high magnification valves has been avoided. One of these valves can replace two audio valves in the average receiver, or where there is only one audio stage, a pentode in place of the ordinary valve will mean much louder signals. Most listeners will, of course, replace the last valve with a pentode when it is desired to try the effect of the new audio valve.

Increasing B Eliminator Voltage.

IN the case of a B eliminator not delivering sufficient voltage for the plate of a super power-valve, the output voltage of the whole eliminator may be raised by the simple expedient of placing a double-wound step-up transformer at the input, so that according to the step-up ratio the voltage to the eliminator would then be 250, 270, or more, and the output would be correspondingly increased. The ratio of an eliminator transformer on 230 volt supply is usually about 1 — 1, so that the additional step-up transformer would not have a ratio of more than 1 to 1.25 or 1 to 1.5. Unless the eliminator contains high test condensers they would have to be charged for a type to stand up to the higher voltage.

Raytheon "A" Rectifiers.

SEVERAL correspondents have enquired as to the method of using the Raytheon cartridge for A battery charging. There have been some reports of failure with these rectifiers, but they appear to have been due to overloading. The manufacturer's statement of the amount of current they will pass is rather liberal, so that say two-thirds is a safe working output. For their use a good plan is to construct the A battery charging transformer described on March 2nd, but without filament winding, and with 126 turns secondary tapped in the centre giving 8 to 9 volts each side, regulated by one or two taps at the outside ends. For half-wave, using only one cartridge, only one half of the secondary would be used, giving one amp. Full wave, using two cartridges, would give two amps. without overloading.

For full wave the centre tap is negative. The case of each cartridge is connected to a respective outer end of the secondary. To each small end of cartridge is connected a 10-amp. fuse, the outer ends of which are connected together to form the positive output. For half-wave the cartridge is similarly joined to one side of secondary, its thin end being positive, whilst the other lead includes a 10-amp. fuse, and is the negative.

Connecting B to C.

IN the construction of a receiver the B battery negative lead is usually connected to the A plus terminal. The main object in this is to obtain a few volts higher potential on the B battery. Less risk of "blowing" the valves would be run if B minus was connected to A battery negative. The few volts lost would be negligible. In the majority of sets the A minus is direct to earth. If by any chance the B plus terminal touched the earth or aerial wires or fell over, catching the C battery, then the B battery would short circuit, but the valves would still be whole, which would not be the case if B minus was on A plus and the filament switch was turned on.

New Linen Diaphragm Speaker.

BY the time this issue is out of the press the new Linck diaphargm speakers will be on the market. These will be available as kit sets, including unit, linen, with wooden frame, and "dope" to treat the material after fixing it on the frame. Units alone will also be obtainable, and these will prove eminently suitable for the home construction of cone or double roll speakers.