

Huge Reductions

Having decided to specialise in Repair Work and Set-making, we are offering the following items for quick sale:

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Specialist in Repairs and Construction.

L. H. WRIGHT

RADIO SPECIALIST,
10 Manners St., Wellington.

RADIO DIRECTORY

What to Buy and Where

AUCKLAND

ALTONA & HAMMARLUND-ROBERTS SETS.	Johns, Ltd. Chancery Street, Auckland.
ATWATER-KENT RADIO ..	Frank Wiseman, Ltd. 170-172 Queen Street, Auckland.
BREMER-TULLY RADIO	Superadio, Ltd., 147 Queen Street, Auckland.
BURGESS RADIO BATTERIES,	All Radio Dealers.
FEDERAL, MOHAWK, GLOBE	Federal Radio House, 8 Darby Street, Auckland.
FERRANTI RADIO COMPONENTS	A. D. Riley and Co., Ltd. Anzac Ave., Auckland, and all leading dealers.
GREBE RADIO	Howie's, Dilworth Building, Custom st., Auckland.
MULLARD VALVES	All Radio Dealers.
PREST-O-LITE. Car and Radio Battery Service	L. J. Purdie & Co., Ltd. 97 Dixon Street, Wellington.
RADIOLA RECEIVERS and Expert Radiola Service.	Farmers' Trading Co., Ltd., Hobson Street, Auckland.
T.C.C. CONDENSERS	A. D. Riley and Co., Ltd. Anzac Ave., Auckland, and all leading dealers.

COUNTRY TOWNS

ANCHORADIO, BREMER-TULLY, RADIOLA, BROWNING-DRAKE, AND ATWATER-KENT RADIO	Radio House, Hamilton. G. S. Anchor, Manager.
BROWNING-DRAKE SALES AND SERVICE	J. H. Sinclair, Otane, H.B.
CROSLEY ELECTRICAL AND BATTERY MODELS	The Forrest-Crosley Radio Co., Ltd. Cuba Street, Palmerston North.
GAROD, CROSLEY, RADIO AND ACCESSORIES	The Hector Jones Electrical Co. King and Queen Streets, Hastings.
GREBE, CROSLEY AND RADIOLA SERVICE	E. Dixon and Co., Ltd., Hawera.
RADIOLA DEALER AND SERVICE	G. C. Carrad. 140 The Avenue, Wanganui.
PHILIPS VALVES AND APPARATUS	All Good Radio Dealers.

The Construction of the Pentode Valve

A Power Valve With Unequalled Amplification



It has been stated by a wireless correspondent to a London paper that there are over 1200 different types of valves on the market for the amateurs to choose from. Little wonder, then, that the man who has just dropped a valve is rather puzzled when he has to choose one as a replacement from this selection. We are constantly hearing of a new valve with improved characteristics being offered to the public and before we venture to speculate on a new valve with tremendous claims, we generally wait until a friend has tried one out. There is one valve, however, which can be purchased without waiting to hear how Mr. So and So got on last night with his.

This is a valve for the last stage called the Pentode, the one to be described being the B443, made by Philips Lamps, Ltd. A similar valve is made by Mullards, PM22, and the following remarks as to general characteristics are equally applicable to it.

control grid acts in the same way as the usual grid in the three-electrode valve. Surrounding this is another grid with a lead brought out to the small terminal on the side. Between this grid and the plate is yet another grid. This is called the "earthed grid," and is connected inside the valve to the centre of the V-shaped filament. Its use will be described later. The plate surrounding the whole is connected to the usual plate pin in the base.

Negative grid bias is applied to the inner or control grid as is usual with every other type of power valve and with 150 volts on the anode, 15 volts negative bias is required on the grid. To the second grid a high potential is applied, and this is done by connecting the small terminal on the cap by a piece of flexible wire to the B plus amplifier terminal. The earthed grid at first appears to have no value, as no connection is made to it outside the valve. Under working conditions the plate is undergoing a bombardment of electrons given off by the filament. So-

Forthcoming Features

"Pentode" will describe in future issues:

1. Shield Grid 5-Valve "Browning Drake."
2. "All-From-Mains" Crystal Amplifier.
3. Pleated Diaphragm Speaker.
4. Whole-wave Crystal Set to Work Loudspeaker.

WATCH FOR THESE ARTICLES—THEY WILL BE WORTH WHILE.

When the radio enthusiast reads of its characteristics he will wonder if the writer is often given to such hallucinations, and he will have every excuse when it is stated that here is a super-power valve with an amplification factor of one hundred. Much has been said of the screened grid high frequency valve. It has been tried and has proved its merit. Well, here is a screened grid power valve.

The Internal Construction.

AS its name implies, the Pentode has five electrodes. To look at, it is the same as any other valve except that it has, at the top of the base, between the glass and moulded cap, a small terminal.

If one could see inside a big difference would be noticed between its construction and the assembly of the triode. Instead of the usual single grid there are three grids. The necessary extra supports give the whole a very complicated appearance and one wonders at the workmanship displayed in getting the three grids and filament surrounded by the plate. The valve is supplied with the standard American base and is easily adaptable to any set using one or two stages of low frequency amplification.

It has been stated already that there are three grids. The inner or con-

called secondary electrons are reflected by the plate and tend to return in the opposite direction to the second grid, which is also at a high potential. The use of the earthed grid is to prevent this return flow of secondary electrons, which if allowed to take place would upset the working of the valve. The earthed grid being at earth, potential absorbs these stray electrons and leads the charge back to the filament.

Four volts are applied to the filament of this valve. Those readers who are using 4-volt valves in their sets will have no trouble. Just plug the valve into the last socket and connect, with a piece of insulated wire, the small terminal on the side to B plus amplifier or to the highest value used on the B battery or eliminator.

Fitting the Pentode.

A LITTLE difficulty may be experienced in adapting this valve to a receiver using 6-volt valves. The Pentode would soon be useless if 6 volts were run for any length of time through the filament, and a resistance will have to be used to bring the voltage down to four. As the valve takes .15 amps the value of this resistance will have to be about 14 ohms. Unless a 20 or 30 ohm rheostat is used to control the last audio valve only, the additional resistance will have to