the conventional variable condenser symbol is shown between the aerial and the coil.

3. How do you detect the detector?

A.: Usually if you tap the detector you can get a ring in the speaker. Other valves in the set will also give a ring, but the detector is the most pronounced. Furthermore in the lead to the grid of the detector valve is a grid leak and condenser. It is usually preceded by a coil and followed by a transformer.

S.W. SUPER (Taranaki): The valve of the resistance is really not important. 100,000 ohms will be quite sufficient, although 500,000 ohms would do equally well. 500,000 ohms would make a good volume control used in the manner you suggest. It is really preferable to vary the voltage on both the s.g. valves, in order to control the volume.

GRID (Whangarei).—Yes, our specifications were slightly confused; 2100 was the maximum, that is, 1050 on either side of the rectifier. This will allow a slightly bigger margin than would the 850 specified. As, however, if you use half-wave rectifications you will need only 1050 turns, which will leave a big margin.

STALLOY (Thames).—Using a stalloy core, 3 x 3, what number of turns per volt must I use on the transformer to be connected with the 230-volt 50-cycle mains?

A.: You will require one turn per volt. The transformer will be 95 per cent. efficient.

2. Where could I get an uninsulated transformer steel?

A.: Try the National Electric Engineering Company, Wellington.

3. The shell and core pattern transformers are usually considered to be the most efficient.

STEP-UP (Greymouth).—Your questions are beyond the scope of Q. and A.

VELOX (Auckland).—Please send your circuit and we shall amend it as you desire.

M. (Miramar).—All you can do is to keep experimenting with different numbers of turns. We tried out a very large number, and those we published give the best results. If this is not the case with you, you can only do as we did, try various adjustments.

H.G.T. (Wellington).—Does the mutual conductance of the s.g. and pentode valves vary as the impedance?

A.: The impedance has a bearing on the mutual conductance, but it is wrong to say that the mutual conductance varies as the impedance, m.c., can be measured in mhos. by dividing the amplification factor by the impedance and multiplying by a million. It can be seen from this that m.c. will be constant for a given amplification factor and impedance only. Anything that tends to diminish the impedance or raise the amplification factor will better the m.c. Conversely, anything that increases the impedance or diminishes the amplification factor will have the opposite effect.

2. Does the mu refer to the plate current only or to the sum of the extra grid and plate currents?

A.: Indirectly to both, in that the extra grid influences the impedance which in turn influences the mu. The actual calculations are made from the plate current only. Mu, of course, denotes amplification factor, and is derived from the curve of the valve by comparing changing current brought about by change in anode voltage, divided by change in grid voltage responsible for the same variation in the plate current.

3. If reducing the ht. on the extra grid increases the impedance, and therefore the amplification factor, why not use no voltage on the grid?

A.: If you increase the impedance of a given valve, you will diminish the amplification factor. A valve has a high amplification factor, not because it has a high impedance, but because of the arrangement of the elements within the valve. Consequent upon this is the high impedance.

B.B. (C. Otago).—Using a 2-amp tungar bulb, what is the correct voltage to tap off the transformer to charge a 6-volt accumulator with 2 amps?

A.: The drop through the bulb passing 2 amps. is about 10 volts. Consequently you will require 16 volts. A better plan would be to make provision for 20 volts, and use a resistance to regulate the charging rate.

2. What voltage would be required to charge (a) a 50-volt accumulator, (b) 100-volt accumulator at an eight of an amp?

A.: The drop through the valve would be about 15 volts, consequently the secondary must be capable of delivering 65. (b) The drop will be from 20 to 25 volts, hence you will require 120-125 volts, from the secondary. The hook-up is the same in all three cases, and the rate of charging for the "B" accumulator will be about 100 mamps.

J.C. (Dunedin): Yes, to your first two questions, and no to the third.

GREEN GRASS (Pelorous Sounds): Would three "B" batteries give me better reception than two?—We think so.

CARAVAN (Wellington): Our Super Six is somewhat similar to the circuit which you are using, which, by the way, contravenes the P. and T. Department regulations. As we shall be publishing full details of this set in the near future, we advise you to use your parts for it.

W.A.L. (Rangiahua): What can I do to stop the noise from a lighting plant coming through my set?

A.: You can overcome the difficulty by using chokes and by-pass condensers in the manner described in the "R.R." for August 14.

OWL (Greymouth): Volume from the "Kestrel Three" is very weak. Tuning is very sharp and the set oscillates when the differential condenser is earthed.

A.: There is a fault in the set somewhere. Make the following tests: See that the moving vanes of all three condensers are actually connected with earth, that the fixed vanes cannot touch the moving or earth, that a condenser is not being shorted out through its proximity to shielding. Bring the aerial in to the fixed plates of the detector condenser and see if there is any improvement in either volume or operation. If there is, then there is definitely a fault in the r.f. stages. Have you remembered that the cap of the s.g. valve connects with the plate? Are you getting screen voltage to the r.f. valve?

2. Is it in order for a spark to occur when I connect "B—"? It occurs only once after an interval.

A.: This indicates that the condensers are charging and it is quite in order.

DX15NW: Is it necessary to earth the dead end of a Beverage aerial to a resistance, and why?

A.: We said so, and gave the reason in the article on the Beverage aerial published in the "R.R." on October 3, 1930.

2. Is fencing wire as good as the standard copper aerial wire?

A.: For the Beverage aerial, yes.

ARIKI (Blenheim): Your present aerial is the better.