the condenser being of the wrong value. The correct values are as follow: Plate resistance, 100,000 ohms; grid-leak, 1 meg. Coupling condenser should be from .001 to .5 mfds. High voltage should be applied to the plate resistance, say, from 125 to 130 volts.

3. After switching over from gramophone reception the radio signals take from two to three minutes to come through.

A.: This sounds very much like a defective switch. Prize the prongs together and clean it with sandpaper.

4. The switching on and off of a house light effectively cuts off signals for a period of from 15 to 30 seconds. Signals then come in again gradually.

A.: This may be due to a fault anywhere in the receiver, and it will be very difficult to locate without tampering with the receiver itself. It may be in that r.c.c. unit.

5. How can I reduce my detector voltage below 100?

A.: If you are using r.c.c amplification it is not necessary to reduce the detector voltage any lower, but for transformer coupling a fixed resistance of from 10,000 to 15,000 ohms would reduce the detector voltage to a suitable figure.

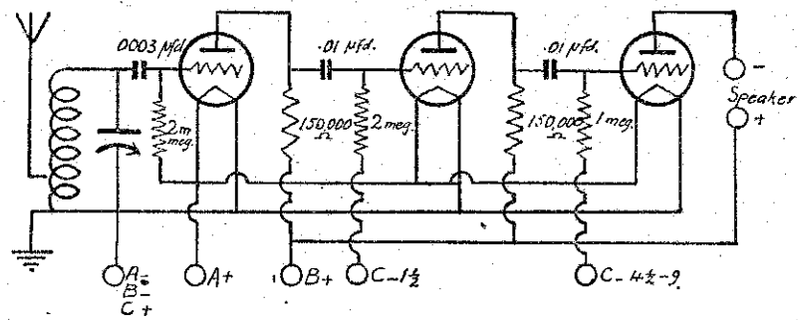
E.J. (Ohura): Also see full acount of the Beverage aerial published in the "Radio Record" of October 3.

F.L.R. (Chch.): Regarding the Night Hawk Two, the signals are unaltered whether or not a grid-leak is used. Reaction is accompanied by a back lash.

A.: Try connecting the 400 ohms potentiometer across your "A" supply and taking the variable tap to the grid-leak. This of course is not connected in parallel across the condenser as is shown, but is taken to the gride side of the variable tap. The grid return is then taken to A—.

PUZZLED (Gisborne): I recently built a booster which failed to give good results.

A.: We are not really surprised at that. Our experience with boosters has been that very few work satisfactorily, and we do not recommend their construction. If you want to incorporate a s.g. valve you



should rebuild the radio section of your set and use the improved method of transformer or tuned anode coupling.

2. Can I couple the grid leak and the grid condenser in series?

A.: No; if you are attempting resistance capacity coupling you are quite wrong. We publish a diagram showing the correct method of coupling valves by this system.

DIEHARD (Seddonville): Will you give me particulars of the Daniell Cell and will it keep my five-valve American battery set charged?

A.: The charger was descibed in detail in our issue of November 7, 1930. It would not, however, be suitable for your set, as the total filament consumption would be well over an amp and the rate of charge with a Daniell Cell is only about ½ an amp.

H.M.D. (Blenheim): What valves would give the best results in my American sets. The present are 201A's, but I want to use Philips or Mullard.

A.: For best results you should use the 201A's or the newer valve, the 221, in the radio stages. For detector you could use A615 Philips or P.M.6D Mullard. On the audio side you could use A609 Philips or 5X Mullard. For the power valve Philips 605, Mullard P.M.6. B605 has an output of a quarter of a watt.

2. Can a pentode be used?

A.: Yes, merely by connecting the auxiliary grid to B+.

3. Is the enclosed arrangement of "C" batteries correct? I find I have to reduce slightly from the approved ratings.

A.: For the first audio stage you need only 3 volts, and for the last stage it is sometimes necessary to depart slightly from the manufacturers' specifications.

4. What type of volume control is on my set? What type and size would be best to replace the one that has burnt out?

A.: We do not know. If you took your set to a reliable dealer he could tell you the resistance of the volume control and replace it for you.

5. Does a Daniell Cell charger need an external source of electricity?

A.: No. The Daniell Cell as described in the "Radio Record" of November 7, 1930, points out that it generates a supply of electricity which can be employed for battery charging or even for operating a set directly.

6. Beside the long lead, is the aerial of which I enclose the plan good?

A.: It is pretty complicated and we consider you would be better with a single aerial 40 feet high and with a short lead-in. One aerial tends to screen the other as you now have them.

7. Is a brief description of the Pierce earth system possible?

A.: The Pierce system was described in the "Radio Record," March 6, 1931.

QUEST (Chch.): I have built an Edison element battery. Where could I obtain particulars of a home-made charger?

A.: The 1930 "Radio Guide," of which copies are now difficult to obtain. This will suit your purposes.

2. Could I charge the whole 90 at once, or would I have to split the battery?

A.: You could charge the whole 90.

3. How long should a charge last, using my set six hours a day?

A.: That depends upon the capacity of your battery, which we do not know.

4. What are the best valves to use?

A.: Five 201A's or 221's, or their equivalents, and a 171 type power valve in the last stage. This must be suitably biased.

QUERY (Te Awamutu): For results, which short-wave adapter is the better, the one described in last year's "Guide" or the one described in the 1931 "Guide"?

A.: The superhet. adapter in the 1931 "Guide."

2. I have heard that hum is inclined to be objectionable.

A.: You will always have to face that with a.c. shortwave reception.. However, a special article has been devoted to a shortwave power pack which describes very fully all the smoothing necessary for that type of eliminator, and this should help you in eliminating hum from the super het. power supply.

G.L (Auckland): My aerial is 100ft. long, double wire. Will a variable condenser in series with it increase the selectivity?—Yes.

2. What set not exceeding five valves is the best for volume on distant stations and tone on the local station?

A.: "The Radiogram Five," in the "Radio Guide."

3. For the Two R.F. B.D. which is the better ratio for transformers, 3½-1 or 4-1?—A.: There is really very little difference between the two.

4. Which are the best valves for the 2RF.B.D.?

A.: Valves of the 201A type in the radio stages, a detector of the 615 or 6D type; audio valves, again the 201A type and for a power valve the 605 type.

5. Is unspaced d.s.c. wire as effective as spaced enamelled wire?

A.: That very much depends upon the shape of the coil and the total number of turns to be wound on. The best plan is to follow the directions given and not try to make any adaptations. All coils are very carefully worked out before they are published.

6. What is the best metal for shielding?

A.: Either copper or aluminium. The former is easier to work but the latter more effective.

KEIJO (Invercargill): My set will not operate below 212 metres, although I can tune down to represent 200m. Although I can hear stations down here I cannot separate them.

A.: We cannot tell; it may be anything. Perhaps your coils are not matching when you get up on to those very high frequencies. It is a case either for a serviceman or to be ignored.

2. How can I reduce hum in my a.c. set?

A.: You cannot, unless the set is home-made. Hum reduction is a matter for a skilled engineer.

BUDDY (Masterton): What solution is used in a balkite battery charger?

A.: 1.200 specific gravity H2SO4. This can be obtained from any battery service station.

CYCLOTS (Wellington): I am constructing a 1-valve set the circuit of which is enclosed. When I disconnected the "B" battery I could still hear music.

A.: That is not altogether unusual, as your valve is still operating because of the effective of the "A" battery on the plate.

CANS. (Dunedin): How can I make my crystal set more selective?

A.: By using a variable condenser in series with the aerial or by rewinding the coil using the circuit that was described in this year's "Guide."

2. How many turns of the enclosed wire must I put on a 2½in. ebonite former?

A.: It is 18 d.c.c. You will need 80 turns.

3. Can you suggest anything that would improve the set?

A.: It is very hard to get the circuit of your set from the plan you have sent along. Apparently, however, you are getting good results and alterations would not be worth while.

TE MIRO (Cambridge): Should the first valve of my set be discoloured as with smoke?

A.: This is probably quite in order. The chances are very much against anything being wrong.

2. Am I using the correct valves?

A.: Your power valve could well be substituted by B405. The 120 valve is a three volt power valve, whereas your other valves are four volters.