

unusual about this, for the distinct click merely indicates that the set is in working condition, and ready to receive signals. The small spark is caused through the circuit of the B battery being completed through the loudspeaker, and valves. If, however, the filaments are turned off, it would indicate that the B battery is being short-circuited, and that insulation has somewhere broken down usually the bypass condenser.

Batteries Unsatisfactory.

THE same writer adds, "Being unable to procure a battery for some weeks, I have been running my set on one block short. Now that I have procured one, I found that on connecting it along with the others, the volume has considerably decreased. If I disconnect it again, the volume leaps up."

ANSWER: The question is a little vague, but one would take it that the valves, particularly the detector and the radio-frequency, are being overloaded with B voltage, and this would cause a marked drop in quality as well as in volume. If the radio-frequency and detector valves have 135 volts on them, this decrease of volume would be expected. The detector rarely needs more than 45, so that the correspondent would do well to see to his connections, so that each valve is getting no more than its correct amount of current.

Various Points.

"A. D." (Whaka) asks the following questions:—

1. Why does my set still work with no reduced volume when the grid leak is removed?

ANSWER: Probably the radio frequency valves are detecting.

2. On removing the "B" plus detector wire from the batteries I can still get the New Zealand stations.

ANSWER: This seems to indicate more than ever that the R.F. valves are detecting, in which case little can be done beyond increasing B voltage on RF valves.

3. On setting the dials to any wavelength between 300 and 350 metres, and bringing the set into oscillation, a roar will start and increase in volume till it shakes the windows.

ANSWER: Caused evidently through a microphone detector valve. Try another detector.

4. I wish to put a 'phone jack between the first and second stage. How is this wired?

ANSWER: As the set is a factory-made one and has a metal panel our candid advice is "Don't." It is not advisable to try these additions to factory-made sets.

Single Dial Control.

I HAVE a four-valve set which I would like to convert to a single dial control, but at present the two variable condensers do not read the same for all stations. The aerial tuning condenser feeds more capacity (greater dial reading) than the grid condenser. What would you advise?—M.L.

ANSWER:—See "Beginner Corner."

Pentode's 3-in-One.

"VALVE" (Christchurch) asks the following questions relative to the "3-in-one":

1. Could honeycomb coils be used in this set? If so, could the 18th turn and 50th turn coils be used in conjunction with a two-way coil holder?

ANSWER: A honeycomb coil can be used, but its capacity would be slightly different from that of a plain solenoid coil. The grid coil would need to be much less than 50; in fact, 30 would almost cover the broadcast band, that is, provided it was tuned with a .0005 variable condenser.

2. Could the Browning-Drake type of coil with the moveable tickler and an extra winding of 20 turns for the aerial be used?

ANSWER: Yes, it would be quite all right.

3. Should there be a wire between the bottom of the grid coil and the earth?

ANSWER: This is contrary to the regulations of the P. and T. Department, but the battery can be earthed.

4. Would 24 gauge D.C.C. wire be suitable for these coils?

ANSWER: If honeycomb—yes. If solenoid, put on a few turns less.

5. Please advise the specifications of coils for wave lengths between 80 and 200 metres.

ANSWER: Twenty-two turns secondary and 7 turns tickler on a 3-inch former, with 18 tinned copper wire, will tune from 65 to 110 metres, while, say, 30 turns secondary and 10 turns tickler would probably cover the remainder of the band. However, this would have to be decided by experiment.

Improving a 4-Valve Set.

WITH regard to a 4-valve set, "Phasatrol" (Paeroa) asks:

1. Is a clorostat in conjunction with a .00025 condenser correct for a phasatrol?

ANSWER: A phasatrol used in the position suggested by the correspondent would not be advisable, as it is going to weaken volume considerably. The best method of neutralising is on the neutrodyne principle as described in the Beginner Corner last week.

2. Could you suggest any alteration or improvement on an ordinary four-valve set?

ANSWER: Yes. The following should improve tone.

1. The incorporation of a by-pass condenser and radio frequency choke between the tickler and the first audio transformer, such as was described in the "Radio Record" recently. Connect a fixed condenser of a capacity ranging from .001 to .0005 from the transformer side of the tickler to "A—." Between the point where the wire to the condenser leaves the lead from the tickler insert a radio frequency choke to connect to the audio transformer.

2. If an output filter such as described in the "Radio Record" of February 8 were added an improvement should be noticed. The condenser from the radio frequency choke should be at least .5 to 1 mfd., but the .001 condenser put directly across the speaker is not necessary.

Pentode's Dynamic Cone.

I INTEND making the moving coil loudspeaker as described in the "Radio Record," writes "Fan" (Dunedin), and would like verification on the following points:—

1. If a pot made entirely of ordinary cast iron, including the ends and the core, were used, what thickness of walls and general dimensions would you advise, the gap being 3-32nds, instead of 5-32nds?

ANSWER: There is no need to make any alterations in the specifications; try to obtain an end plate of dynamo steel.

2. Could I have a high resistance moving coil so as to avoid the necessity for a step-down transformer?

ANSWER: It would be difficult to construct such a coil with a gap of 3-32nds, as 1000 turns of 44 gauge wire would have to be wound on.

3. If the pot-magnet coil is wound for 230 volts, can it be plugged into the lighting mains without any intervening units?

ANSWER: No, the A.C. current would have to be rectified. Rectifiers have been fully dealt with in the "Listeners' Guide."

4. Is the 230-volt winding as effective as the 6-volt accumulator winding, and could the latter be energised by a Tungar charger of 6v. 2 amps. output?

ANSWER: To the first part of the question, "Yes"; if the winding was to be energised by a charger, it would be as well to connect an accumulator in parallel with the speaker. In other words, to float an accumulator across the speaker windings.

5. I presume that an ordinary 6-volt accumulator, which is already feeding 5-valves would not be able to stand the strain of a moving coil loudspeaker as well as the set? Am I right?

ANSWER: Yes. The strain would be rather much. Connect the Tungar charger to the accumulator, and float this across the speaker windings.

Position of Transformers.

I AM building a set, using two transformers of the ratios of 6-1 and 4-1. Which transformer should be the first? "H.J.F.P." (Henderson.)

ANSWER: It is claimed by recent investigators that better results accrue if the smaller ratio is used in the first stage.

A Very Long Aerial.

"L.A.K." (Mangamahu), writes, "I have erected by the way of experiment, an aerial approximately 750ft. long and between 100 and 130ft. high, using 12-gauge copper wire. I find that I cannot tune to the lower wavelengths, although I have tried different capacities of condensers in series with the aerial. How might I tune in the lower wavelengths?"

ANSWER: An aerial of this dimension has a very great self-inductance, so that less inductance is necessary in the aerial coil. Try reducing this. It will be found that volume will be slightly decreased, and this is the general problem of aerials, but if the correspondent works along the lines suggested, he should do some interesting experimental work. Try a neutralising condenser in series with the aerial lead.

The Heat of Filaments.

"G.I." (Hastings) writes: "In last week's 'Record' I read that audio valves should be burned full on, but my set works best with two audios controlled by one rheostat, and turned about

three-quarters on. The R.F. and the detector are both controlled by a rheostat, which works best when turned down. If turned on too far the set bursts into oscillation. If the audios are turned on fully, there is no noticeable increase in signal strength, while static is far louder and comes in with sharp cracks instead of the usual crackling. The valves are the 4-volt type, and are heated by three 15-volt cells.

ANSWER: In this particular case, the burning of the filament with the rheostat turned on full would mean that the filaments were getting half a volt of current more than they should do, so that the rheostat would naturally have to be turned back. The set bursting into oscillation would indicate that there are too many turns on the tickler or the set is not correctly neutralised.

2. My earth is a tin chimney of about 16 sq. ft., and buried 5ft. underground. It is connected to the set by 7ft. of wire of the same gauge as the aerial. I have soldered a wire to this earth and carried it about 20ft. under the house to a clamp on the water pipe. Would the water pipe earth be an advantage?

ANSWER: Providing the first earth was efficient and kept damp, no. The 20ft. of wire would offset any advantage.

Concerning a Portable.

"G.W.R." (Karori) wishes to dismantle his portable set, and seeks advice on the following points:

1. Could you supply me with the diagram of a circuit, and particulars of components?

ANSWER: If the correspondent wants a really good portable set, he could no better than construct the "Rotorua"



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