

when I connect it to an 80 amp. battery the liquid boils and the charger gets too hot to touch after a few minutes.

A.: There appears to be a short circuit in the 80 amp. hour battery. Treat it as described in the "Radio Listeners' Guide."

#### A Legal Point.

CAN a shopkeeper sell a second-hand two-valve set which belongs to a private person. He does not have a dealer's license.—F.J.H. (Wellington).

A. No. There is no objection to a man selling his own wireless set, but when anyone sells another man's set he must have a radio dealer's license.

2. Is there any remedy for a paralysed valve which will oscillate on the local station but not on a distant one?

A. This is an unusual case, and it appears that a new valve is required.

#### Various Points.

I HAVE been troubled with a dead spot, writes K.A.D. (Wellington), and have found that when I watered the earth is shifted. Is this usual?—No.

2. How can one tell for certain that the set is not oscillating?

A. Damp the finger and place it on the aerial terminal. If a "plo" is heard in the speaker the set is oscillating.

2. Is it natural for stations to come in as follow: 7ZL on 30 degrees, 1YA on 81.

A. Your dial is back to front. Either turn the condenser up the other way, get another dial or put up with it as it is.

3. I wish to go away for Christmas, taking a set with me, but leaving one to be operated at home. Do I take out another license for 30/-?

A. No. Take out one for the period you will be away.

#### Getting America.

SHOULD I be able to get America with a six-valve battery set?—R.A.S. (Mamakura).

A. Getting America depends very much on location and the type of aerial. The writer has heard several American stations on this type of set using a Beverage aerial, such as was described in the "Radio Listeners' Guide."

#### Audio Transformer.

WHICH transformer should go first, a 5-1 or 3-1?

A. The lower ratio transformer should always go next to the detector valve, the reason being that better quality and sensitivity occurs through matching the impedance of this valve to the transformer. The valve impedance is high, so a high impedance transformer must be used. The 5-1 having a lower impedance takes the second place.

2. I am using two shielded transformers and when I place my finger on the shielding of the first there is a loud howl in the speaker. What is wrong?

A. Feed-back is occurring, so earth the core and the case of the transformer.

3. Do two transformers of the same ratio work well in an amplifier?—Yes.

4. Do you suggest the use of a variable grid leak in a short-wave set?—"Grid Leak" (Blenheim).

A. No, they are inclined to be noisy.

#### Valves Wrongly Placed.

I AM using B 605, A 615, C 603, in my radio set. Can you identify the sockets and tell me where the valves should go?

A.: It is hard to identify the sockets when the receiver is not a usual one. The radio frequency valve is always associated with the coil and condenser. A lead from the coil goes to the grid terminal of the RF socket. The detector is always recognisable by the grid leak and condenser attached to its grid socket. The power valve has its plate connected to the speaker terminal or out put jack. The RF valve (in Philips series) should be A 609. The detector A 615, the power valve B 605, or C 603, with nine volts grid bias. When using the 171 A with 90 volts about 20 volts bias should be applied.

2. I have to constantly adjust the screw of the diaphragm of my speaker to prevent rattle.

A.: It appears you are saturating the speaker winding with too much anode current. Increase the grid bias and try the use of A 609 or its equivalent in the place of B 605 in RF.

#### Stations Mushy.

I HAVE an American set, and am using Continental valves. I have altered the coils and now find that the reception from overseas stations is mushy. Can this be altered?

## Laboratory Jottings

### Components and Portables

THE following components, supplied by A. E. Strange, electrical engineer, Christchurch, have been tested to our satisfaction:—

#### Dubilier .0001 Variable Condenser.

This piece of apparatus has been specially designed for short-wave work. It has a special ball-bearing gear which enables a fine adjustment. The ratio of the dial movement to condenser movement is approximately 200 to 1. A rotating shaft moves a bushing piece at the back of the condenser and between this and the shaft is a single glass ball-bearing which moves its position as the dial is rotated. Thus perfectly smooth movements may be obtained and the finest values of capacities are possible. This condenser is particularly suitable to short-wave work. The .0001 midget variable condenser has also been supplied for tests. This is of the usual type for balancing and may be used for reaction.

#### Horizontal Grid Leak Holder.

This Dubilier product, which is sturdily made, may be fitted into any

A.: You have made a rather unfortunate mistake of using anything but American valves in an American set. This affects the neutralising and quite frequently series filament resistors are used in the circuit to break down a 6-volt battery potential to 5-volt for the American series. You should revert to American valves and re-neutralise your set.

2. Could I use three blocks of "B" batteries, and two "C" batteries with this set?

A.: Yes. The highest potential of 135 volts should be applied only to the last valve. Likewise the highest grid volts should go to the grid return of the power valve. A small grid potential of about 4½ volts should be applied to the second last valve.

#### Turns on a Voice Coil.

I HAVE an English 6-volt dynamic speaker equipped with a high resistance speech coil. This coil has apparently developed a short-circuit and I am contemplating removing it and winding on an American type low resistance coil for use with a 25—1 step-down transformer. Can you supply me with data re gauge, of wire and number of turns? Valves used, Osram P625 A's in push-pull. Will you also supply data of turns and gauge with P625's and Philips B403's?—D.R.K. (Hastings).

A.: All voice coils wound with 30 S.W.G. enamelled wire. P625A, 65 turns; P625, 105 turns; B403, 75 turns. quickly.

set. There is nothing shoddy about its manufacture, with the result that it will stand up to hard work in the form of pulling about from one circuit to another. The vertical grid leak holder has its application in the circuit where the grid of the valve is connected to A + for detection purposes. The grid leak tested was perfectly silent and satisfactory.

#### 35 Ohm Resistances.

This is a fixed resistance similar to the Amperites, and, mounted as they are, its application in the set is where the voltage of the valve is much lower than the voltage of the accumulator.

#### The Airzone Portable.

NOTHING is more useful in providing music during camping and picnic excursions than a good portable, and our test of the "Airzone" (Smyth and Co.) reveal that it is one of the best. Tested under adverse conditions, heavy static and bad localities, this set performed well. It always brought in 2YA even at great distances, and when a temporary aerial was erected it was as good as a home receiver.

The circuit is the familiar Browning-Drake, with the antenna coil enlarged as a loop antenna, in which a tap for an aerial is provided. The ground joins the filament negative through a terminal in the lid.

An automatic switch is provided by which the set is shut off when the lid is closed. Battery current cannot thus be wasted by the set being closed up with the rheostat on.

Everything is robust, and will stand reasonably rough handling. The built-in speaker is exceptionally good for this class of work, and is a pleasure to listen to.

## Connecting Flashlamps

VERY frequently it is desired to have at hand some means of rapidly connecting up one or more flash-lamp batteries for temporary use. Many kinds of clips and other fasteners have, of course, been brought out for this purpose from time to time, but, nevertheless, it is difficult to devise a handler form of flash-lamp battery than the following:—A short length (about 2in.) of ¼in. lead tubing is bent roughly in a U-shape, and the ends are flattened out. The flattened ends of the U-shaped piece of lead tubing constitute a grip for the battery electrodes, and the weight of the tubing not only effects a firm and decisive contact, but it also makes the connector an easy one to handle quickly.

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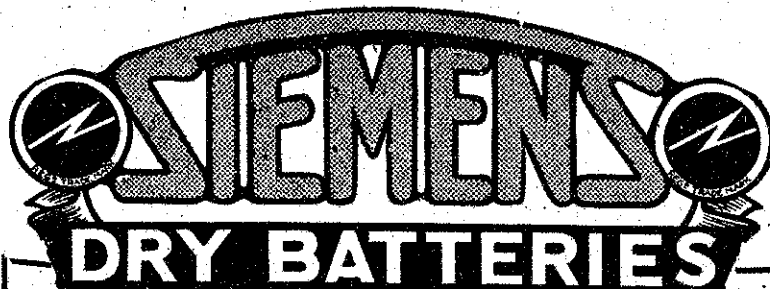
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