The Daniell Cell Charger

IN our issue of November 11, 1927, "Megohm" described a charger comprising Daniell cells. A correspondent has been using this but meets with trouble. "I have installed the Daniell cells on accumulators as the R.R. article describes. I find that the zincs are used very badly within a month. Since then have brought the Epsom solution from half saturated to 2oz. for the six pots. (½pt. capacity each approximately) still they seem to eat away quickly. I changed to 1-80 of sulphuric acid with new zincs, and they were treated the same. Should the zincs last very long? Bluestone seems to go into the porous pots quickly.

Questions.—(1) How can I check the bluestone from creep; too much to make the zincs last longer, using either Epsom or sulphuric in pots.

(A.) Bluestone and numerous other "salts" exhibit a peculiar action. If a piece of bladder similar to the material used for sausages, is filled with a solution of bluestone it can be sealed up and will be perfectly watertight. If, however, this container, tied up tightly is lowered into a vessel of water, in a few hours the water will be found to be turning blue, and in a day or so the two solutions inside and outside the bladder will be of the same strength. This is known as a "colloidal" action. The bluestone has passed through the membrane. The same action takes place in a Daniell cell. There is no actual preventive but the action can be retarded a great deal by arranging so that the two acid solutions inside the porous pot and outside are equal in strength.

(2.) Should Daniell cells show 6 volts, and when 4 jars show 4 volts, should the 4 give same amperage as accumulators to light a torch bulb? This in view of voltmeter giving out.

(A.) The true Daniell cell of bluestone and 10 per cent. solution of sulphuric acid should show 1.8 to 2 volts per cell. The amperage should be from 15 to 30 on dead short, depending on the size of copper electrode and strength of acid. A torch bulb only takes .3 ampres at 4 volts.

(3) Is any harm done to charger in disconnecting?

(A.) No. The zincs should always be lifted out of solution when not in use. You ask about the life of zincs. I presume you have got these amalgamated. If you haven't, get a small quantity of mercury and put in the bottom of each porous pot. About half a thimbleful to each pot. This will coat the zincs with mercury and prolong their life.

RADIO DIRECTORY

What to Buy and Where

CITIES

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.**
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.
RADIOTRONS AND MARCONI VALVES	**All Radio Dealers.**
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.
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.**

Useful Tips and Jottings

Saturation of Transformer.

THERE are several troubles associated with the use of unsuitable L.F. transformers. For instance, a particularly objectionable form of distortion occurs when an ordinary small transformer with a rather "tishy" core is expected to carry a plate current of 4 or 5 milliamperes, and to respond to the signal variation handed to it by, perhaps, preceding H.F., Det., and L.F. stages. In such a case, the magnetic load upon the core is practically at a maximum before signals are fed to the valve and, consequently, its magnetic variations cannot correspond with the signal's impulses, but can only be varied in a limited degree. The distortion effect is similar to that of an overloaded valve unable to respond faithfully to variations of its grid voltage.

Potentiometers.

POTENTIOMETERS used either for adjusting the bias of a detector valve or an H.F. valve should be shunted with a condenser of about 0.1 mfd. capacity. Most potentiometers sold for this purpose have a resistance of several hundred ohms and may introduce losses sufficient to cause a slight reduction of signal strength and sharpness of tuning unless a suitable by-pass of low H.F. impedance is provided. Paper condensers are quite good enough for this purpose. Even if the resistance of the potentiometer is too low to introduce serious losses its inductance will almost certainly be sufficient to upset the tuning slightly when adjustments are being made with it. The by-pass condenser is therefore desirable in any case.

Pick-up Notes.

THE speed at which a record turns plays a very important part in the reproduction of faithful music from a gramophone pick-up. Almost all the modern records are recorded at a speed of 78 revolutions per minute. Occasionally instructions on the record indicate a speed of 80 r.p.m. Very often the speed indicator fixed to the motor is inaccurate, and should be checked up by sticking a small piece of paper on one side of the turntable and counting the revolutions per minute, while the record is revolving.

Needles.

COLUMBIA semi-permanent chronic needles are very good for pick-up work, as these will play 6 to 10 records without the necessity to change. The point should be lowered gently to the record, as rough treatment is liable to break off the tip, and a broken needle goes a long way to ruining the record.

Amplification.

TWO stages of good transformer coupled audio amplification are all that is necessary for a gramophone pick-up work. Good class transformers and a power valve in the last stage must be used, otherwise reproduction will be no better than that of the cheapest gramophone costing less than the pick-up itself.

The Zinc Rod in Daniell Cells.

IT has been found that chemically pure zinc is not attached by sulphuric acid as readily as commercial zinc containing a good percentage of foreign matter. Pure zinc is soluble in the metal mercury forming a pasty solution called zinc amalgam. Mercury is insoluble in sulphuric acid, therefore if a layer of zinc amalgam is formed on the outside of the zinc rod in a Daniel cell, the active surface presented to the acid is pure zinc, the impurities being deposited when the zinc amalgam is formed. To give this coating, first clean the zinc rod by rubbing in dilute sulphuric acid, and then rub on the mercury, when it will be found to adhere in the form of a shining mirror. A small quantity of mercury can be kept permanently in the bottom of the porous pot, and this will keep the zinc constantly amalgamated. Care should be exercised, however, when using mercury not to allow any to come in contact with gold rings or jewelry, the experimenter may be wearing, as mercury also combines with gold, etc., forming gold amalgam. If by any chance a silver colour is noticed on any gold article that comes in contact with the mercury, this can be removed by rubbing lightly with concentrated nitric acid, which dissolves the mercury without touching the gold underneath. If the zinc rods are given this treatment they will be found to have two or three times the life if not treated.

Megohm's Short-Valve Set.

I AM constructing "Megohm's" short-wave set, published some time ago in the "Radio Record," and would be much obliged if you would answer the following questions:—1, Should I use power valve in last socket? 2. How many turns of wire on coils are needed for broadcast wave-lengths for the above set. Trusting you can put me right, and thanking you.—T.G.M. (Wellington).

A power valve is always advisable for second audio stage. For domestic use one of the B605 type is quite suitable. Don't forget to use grid bias as specified by the makers.

If .0002 condenser is used, then use 85 turns for broadcast with 30 turns reaction. If .00035 to .0005 mfd. condenser used, 70 or 60 turns, with 40 turns reaction.

IF you must have joints in either your aerial or your earth wire, be sure they are soldered ones.