A lead soldered to a sheet or rod of metal, which is usually of copper or galvanised iron, forms another very effective earth. Figure 3 shows an excellent method of attaching a lead to an earth plate, which consists of a piece of sheet metal about 2ft. square, preferably of copper, no thinner than 18 gauge. The end of a length of stranded aerial wire is unstranded, stripped of its insulation, and then passed through the hole in the centre. A knot should then be tied in it as shown to prevent strain on the soldered connections, which are taken to various points on the metal sheet.

Another good earth, using a galvanised iron sheet, is shown in figure 4. A strip is cut along one side as shown, and bent up so that the earth connection can be made to it above ground. The lead should be well soldered and taped to prevent corrosion. It is usually preferable to have the connection to the earth plate or tube above the ground, as in damp earth chemical action is set up at this joint, particularly where two dissimilar metals are joined, and corrosion results. For this reason, earth plates and rods should be regularly dug up and inspected, re-soldered if necessary, and then buried again. Joints corroded in this way are often the unsuspected cause of an unaccountable falling off in reception.

A length of galvanised iron piping, driven at least four feet into the ground, makes another good earth. Special copper earthing tubes are also available. A terminal is usually pro-

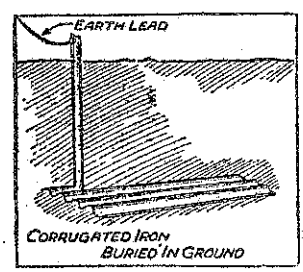


Figure 4.—An excellent earth. Notice how a strip of the corrugated iron is bent up in order to attach the earth lead above the ground.

vided at the top for attaching the earth lead, but it is better to solder the lead directly to the top of the tube and then take a turn round the terminal to take the strain off the joint.

Biscuit and kerosene tins, motor-car radiators, old coppers—all are popular forms of a great variety of earths, and generally they are all equally efficient so long as they are well buried in moist earth. Incidentally, if the soil dries up unduly in the summer, it is a good plan periodically to pour a solution of salt and water over the earth to keep it moist.

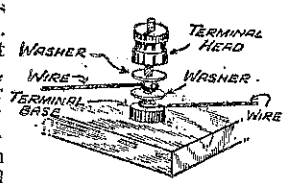
In cases where no connection to permanently moist earth can be secured, or where power interference from nearby transmission lines is experienced, a counterpoise aerial will often give the best results. (See figure 5.)

A makeshift counterpoise can be obtained just by running wire along the floor and connecting it to the earth terminal on the set, but for greater efficiency, the counterpoise aerial should be slung directly below the main aerial and at a distance of six or eight feet from the ground. It is important to remember that the counterpoise must be just as carefully insulated as the aerial itself.

HINTS FOR BEGINNERS

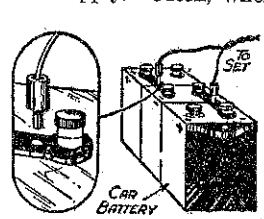
A Terminal Tip: Parallel Feed for Transformers: Making Connections to a Car Battery: Rejuvenating Accumulators: A Simple Aluminium Cutter.

IT is usually difficult to fix more than two loops of wire securely under a terminal end, as the loops tend to open out as the terminal is tightened. To prevent this, a thin, flat washer should be placed between each loop and also between the uppermost loop and the terminal head. This will ensure a secure connection.



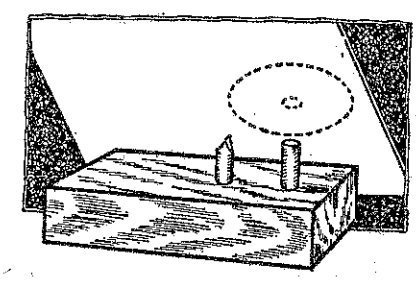
TWO things are primarily required of an audio transformer if it is to give good results. Firstly, it should have a high primary inductance, and secondly, the capacity of its secondary winding should be low. The first can be achieved by winding on a great quantity of wire—but for every turn of wire in the primary, there must be 3 or 5 in the secondary in a 1:3 and 1:5 ratio transformer respectively—and the larger the secondary, the higher its capacity, unless very special steps are taken. To solve this problem, many manufacturers are now using a special nickel alloy core, but here, again, there is another difficulty, because these alloys tend to saturate easily. A current of but a few milliamperes is often very detrimental to their characteristics. Lately there have been developed special alloys, which are more stable, but in general the only method of using "nickel" transformers so that their functioning is free from saturation limitation, is to parallel feed them. To do this the plate supply of the previous valve should be taken through an anode resistance of about 100,000 ohms to the plate of the valve, which is then connected through a 2 mfd. condenser to "P" of the transformer The "B+" terminal of the transformer is then earthed.

MANY country experimenters often use a car battery as a source of "A" supply. Often, when two or four volt valves are employed, it is difficult to find a satisfactory method of connecting one of the "A" battery leads to the connecting bars. A simple method of doing this is to employ wander plugs, sinking the necessary holes in the lead connectors with a metal drill.



WHEN an accumulator has been in service for some time it is very often found that it will not hold its charge as well as it did formerly, even though there may be no signs of sulphation. This is caused by a gradual absorption of sulphuric acid, which hardens the plates. To get them back into condition, the acid should be emptied out and the accumulator washed and filled with distilled water. The battery should be now charged in the ordinary way and, after charging, it should be carefully discharged about half-way. The distilled water will now be found to be strongly acid, its specific gravity having risen considerably. Empty this away and refill with fresh distilled water, and continue this procedure of charging and partially discharging the battery, until the distilled water shows practically no change in density. The accumulator may now be filled with fresh acid of the correct density and charged in the normal manner. It will now be found to hold its charge much better than formerly, and its working life will be greatly extended.

THE constructor who prefers to bend and drill his own chassis often finds difficulty in cutting holes for mounting valve sockets, etc. This simple cutter is quite easy to make and gives good result. Obtain a piece of hard wood, about ¾in. square, and about 4in. long. Screw a ¾in. iron wood screw into this, ¾in. from one end. Another screw should now be put in at a distance from the other equal to the radius of the circle required. It will be seen from the sketch that the screws are screwed in up to the ends of the threads. The heads should now be cut or filed off, and second screw filed to form a slanting chisel point. The way to use the tool is obvious. A centre hole is drilled in the chassis to take the centre screw, and the cutter is rotated about this. As an alternative, draw a circle on the chassis of the required diameter, and then drill small holes round this, just inside the circumference, so that the



edges are just touching. When the circle has been completed the centre piece will fall out, and the circle can be trimmed up with a pocket knife.

THE so-called "dry" battery, which is used in radio for supplying plate and bias voltages, is not in actuality "dry," but a modification of the original Leclanche primary cell employing zinc, carbon and a solution of sal-ammoniac. Instead of this solution being in the form of a fluid, however, it is made up as a paste something of the consistency of the paste used for mounting photographs. This paste is a mixture of sal-ammoniac and certain other material, introduced so that the paste will not easily go dry, as, when it does, the battery is useless. Because of this, dry batteries should always be kept in cool, shady places, well away from fires and radiators.

THE Czechoslovakian postal authorities offer a reward of forty crowns for information leading to the detection of a pirate. Anonymity is respected.