throughout New Zealand. The centres for the examination just finished were given in the "Radio Record" about a month ago.

3. Where can I get the P. and T. regulations?

A.: At the present time they are under revision, and are not necessary for the examination.

4. A book was sent me of the electrical wiring regulations, and stated that P.W.D. radio regulations were included in these, but I cannot find them. Where can I get them?

A.: With the book there should have been a slip directing you to the passages which which should be noted. If you did not get the slip write again to the Employers' Federation and they will send you one. You are also required to know the fire underwriters' regulations, and you can obtain these from the council of Fire Underwriters' Association of New Zealand, 97 The Terrace, Wellington.

DYNAMIC (Onehunga): I have a five-valve set which uses 201A's in all stages. I have recently substituted the speaker for a dynamic cone. The results are very disappointing. There is no volume. I tried a 603 and a similar power valve in the last stage, but without any appreciable improvement.

A.: The original model 300 does not use grid bias, and the same B+ tapping was used for all valves except the detector. It appears now that you are using grid bias. What alterations have been made and who has made them? Are you quite certain that you are applying bias to the last valve only? If you are putting only 15 volts bias on to the second last valve, there is no wonder nothing will come through. At the same time the voltage on the last valve should be as high as possible, possibly 135 to 150, while that on the other valves could quite conveniently be 90 to 135. It is unwise, however, to use a dynamic cone speaker with a small battery set such as you possess. Dynamic cone speakers are built for powerful sets which are capable of supplying to it the requisite amount of energy. Your set was designed for a sensitive speaker such as a horn or a light cone, and we advise you not to use the dynamic type. However, you should get quite good results if you can get the last valve working correctly, which it would appear you have not. Check up, too, to see that you are getting the field current through from the rectifier. It is possible that there is a slight disconnection, and this would cause the symptoms of which you complain. Regarding the step-down transformer, it is probably not necessary, as you have a high resistance voice coil, and, as you say, the 171 fairly nearly matches it. C603 is really near enough because the impedance of the valve should be at least half that of the speaker. They do not have to be the same, as you presume, so in your case a step-down transformer is not necessary. However, if you are using C603 or 171A it would be advisable to use a 1-1 transformer in order to keep the high voltage current out of the speaker, otherwise you may burn out the coil. Do not think, however, that by using a transformer or a filter of any description you will get louder results. You will not, unless by a remote chance the direct current from the valve is choking the speaker.

A Cause of Instability

AN often unsuspected cause of instability in a receiver is the undue proximity of certain connecting wires; for example, grid and plate leads. This is quite likely to cause uncontrollable oscillation. Sometimes it is found that the wiring cannot be spaced further owing to the disposition of the components, and it may be thought undesirable to alter the layout. In such a case, if some of the more important wires, such as the grid and plate leads mentioned above, are cased in earthed metal tubing the set can often be made completely stable.

This tubing should, of course, be of fairly large diameter, or otherwise its presence will throw a large unwanted capacity across the tuned circuit and render ganging, if this is used, difficult. In this case the internal diameter of the tubing should be at least twice the external diameter of the wire, including its insulating sleeving. Soft copper or brass tubing may be readily obtained for this purpose, or as an alternative metal braiding may be used. For a temporary substitute, ordinary tinfoil may be wrapped round the insulating sleeving of the leads which require screening, and held in place by binding with a length of thin bare copper wire, the free end of which could be connected to the nearest point of the earth potential.

Avoiding Hand-Capacity

THE small semi-variable compression type condensers are usually made up of two metal plates or sets of plates with interleaving sheets of mica. Capacity is varied by a set screw, the rotation of which tends to reduce or increase the spacing between the plates. It is important to notice that to minimise hand capacity effect the set of plates which makes metallic contact with the adjusting screw should be joined to the earth or low potential end of the circuit. Identification marks are not normally provided for the terminals, but their internal connections are easily traced without dismantling by making an electrical test. Before doing so, however, it is, of course, essential that the control knob should be screwed home sufficiently for contact to be made between the screw and the metal plates.

Smoothing Out Hum

THERE are two vital factors where the smoothing of audio frequency variations is concerned, namely, capacity and inductance. It often happens, due to one of several possible reasons, that hum is experienced when working a set from an eliminator, and consequently extra smoothing is desirable. Unless the hum is very bad this smoothing can conveniently take the form of extra capacity. No alterations need be made to the eliminator. All you need to do is to connect externally 2 mfds. fixed condensers across the "B+" output terminals and the "B–" output terminal. Another place where extra capacity sometimes helps is across the by-pass condensers of decoupling resistances.

Wiring Hints

AND now for a couple of tips in connection with wiring compotents. The bolts and nuts holding the terminals or valve holders should al—ays be tightened up before the compotents are mounted. Nothing is more exasperating than to try to tighten a terminal which just revolves round and round with the whole bolt and nut. Secondly, small box spanners, which may be obtained at any radio store, will save you much time and trouble when tightening nuts.

Using Frame Antenna

IT is often assumed that any receiver using one or two stages of r.f. amplification will work satisfactorily on a frame attenna if the latter is correctly connected in the circuit. This, however, is not always the case. Often a receiver which is normally quite stable will become uncontrollable when an attempt is made to use it in this way. This instability will often persist even when an earth connection is used with the frame, although the addition of an earth is generally considered a cure for such trouble. The trouble is due to the large field which the frame antenna possesses, and it can only be overcome by extra screening or by moving the antenna to a position more remote from the receiver.

A.C. Power Valves

FOR those who cannot afford to make a complete change-over from ordinary to A.C. valves, it is quite practicable to lighten the load on the accumulator by driving the filament of the output or power-valve direct from the mains. A step-down transformer is required to reduce the A.C. voltage to that taken by the valve. The valve filament terminals are connected directly across the secondary winding, which is preferably centre tapped to earth.

Useful Hints

IF you assemble your own batteries from dry cells do not forget that good insulation between the rows is even more important than insulation between the individual cells.

ALTHOUGH tap water is sometimes used successfully to renew the level of the electrolyte in an accumulator, its use is decidedly risky, and distilled water (obtainable at a chemist's for a few pence) is far better.

COPPER is usually considered the best metal for aerial wire, but phosphor bronze and silicon bronze run it close.

GENERALLY speaking, there is no advantage in using a "cage" or "sausage" aerial for broadcast reception, unless only a limited space is available.

IF aerials attached to different sets are separated by only a few feet it will be impossible to avoid a certain amount of mutual interference when the sets are working.

A LONG lead-in should always be avoided if possible, so the best place for the set is close to the lead-in's point of entry.

DO not throw away your old panels, for you will find that terminal strips and similar handy accessories can be turned up from them with very little trouble.

TERMINAL shanks, soldering tags, and similar points should be filed and tinned before a set is completely assembled, as the operation is much easier at this stage than when all the components are screwed into place.

IF a panel has become slightly bent by leaning up against a wall it can often be flattened by warming it, and placing it between flat boards on which a heavy weight is standing, until the ebonite has cooled.