

(Continued from last week.)

THE problems encountered in a receiver without screening having been treated fairly fully, it remains to deal shortly with the special problems introduced by metal screens. It is fairly well known that introducing any metal object within the field of an inductance coil increases its losses, the loss appearing in the form of an increased high-frequency resistance. What is not so well known, is that the inductance is also reduced by the presence of a metallic screen or other object in the field of the coil. Some readers will remember the "Peridyne" receiver once introduced in America in which this phenomenon was utilised for matching inductances so as to permit of single-control tuning. Older readers will remember the once popular "spade-tuning", wherein tuning was effected by bringing a metal sheet nearer to or further from the inductance coil, thus varying its effective inductance. The metal acts as a short-circuited secondary, the coil being the primary, and the result that of loading the coil with a resistive load.

From every point of view, then, it is imperative that the screening must be kept clear of the denser parts of the coil's field. Experiment has indicated that a sound working rule is to have all screening distant from the ends of the coils at least the diameter of the coil, and distant from the sides of the

coil at least half that diameter; thus a coil of diameter 3 inches and winding length 3 inches, mounted vertically, would demand a screening compartment of height 9 inches; if the same coil were mounted horizontally, a height of 6 inches would suffice. Where it is desired to screen only a coil, rather than a complete high-frequency stage, "Swan" cylindrical hot-water bottles (aluminium) with the top cut off may conveniently be inverted over a 2-inch diameter coil, this being disposed centrally within the adapted bottle; the coil must, of course, be mounted on a disc of aluminium to screen the underside—it is hardly necessary to add that all screening must be connected to the filament circuit.

For winding broadcast coils, a solid former should be used rather than a skeleton one of celluloid, as no appreciable loss will be introduced. The former should, however, be of high-quality insulating material, and cardboard should be avoided; hard rubber is

really best, but formica, bakelite, or paxolin are almost equally good. A ribbed former may be used if desired, but it confers no particular advantages, contrary to popular opinion.

We have now treated all the considerations which should enter into coil design; a summary of the procedure of design is appended:—

(1) From the considerations outlined in this article, determine the most suitable diameter and ratio of winding length to diameter to suit the particular circumstances.

(2) Determine what value of tuning condenser is to be used, and from this the required value of inductance.

(3) From the appropriate chart read off the number of turns required to reach this inductance with the diameter and shape already decided upon.

(4) Read off the optimum diameter of wire and ascertain the nearest standard gauge to this; this gauge should be used.

(5) If the coil is to be close-wound, ascertain what class of insulating covering will distribute the required number of turns of the chosen gauge of wire over the allotted winding length.

A close wound coil will show some loss of efficiency as compared with a space wound coil of the same dimensions and using the same gauge of wire. Silk-covered wire can usually be space-wound without a threaded former by winding a thread of suitable thickness along with the wire and between the turns; enamelled wire merely slips out of place if the former is not grooved, and even the silk wire must be wound very tightly indeed to avoid trouble. Any garage possessing a screw-cutting lathe will usually groove a former with the required number of grooves per inch. In cases where this can not be done a fine wire (uninsulated) can be interwound with a thread to distribute the necessary number of turns over the allotted space, and a heavy current passed through the wire to heat it sufficiently to burn a shallow groove in the former; this little dodge will only work with a hard rubber former, however.

Inductance Coil Design

Effects of Screening

jam of any kind to occur. The only calamity that may possibly happen is that the insulator may be broken by coming into violent contact with the mast if the aerial is let down thoughtlessly with a run. There need be no fear of this happening if a pad made of old sacking is fixed to the mast at the place where the insulator will come into contact with it when the halliards are slackened.

Setting Variable Condenser Dials.

FOR the panels of a receiving set to present a neat appearance, it is necessary to set the dials of the variable condenser on their spindles without a wide gap between their rims and the surface of the panel. This also makes it easier to take accurate readings of dial settings, since the scale passes close to the indicator. It frequently happens, however, that the dial, if set too close, scrapes on the panel and becomes awkwardly stiff to turn.

This difficulty may be obviated in a simple manner, by glueing a ring of thin felt or plush to the underneath of the dial, inside the raised rim. If necessary, thin card rings are first glued to the dial, so that the surface of the felt projects slightly above the raised part of the rim. The dial may then be set down quite firmly against the panel, and it will be found that the condenser has acquired a delightfully "silky" feel round the whole of its scale.

An Improved Choke.

IT sometimes happens that one has on hand an audio-frequency transformer, which, save for a burnt-out primary winding, is undamaged in all other respects. It may be desirable to add a stage of choke-coupled audio-frequency to an existing set, or perhaps to experiment with this form of coupling for the first time. The secondary winding of most audio-frequency transformers can be used as a substitute for a specially manufactured choke by connecting it up in the conventional manner.

In cases where the primary winding of a transformer is burnt out while a set is working, a few changes in the connections will quickly enable the set to be used again as a choke-coupled receiver. It should be remembered that the valve, in whose anode circuit the choke is connected, should be preferably of the resistance capacity or special radio-frequency type to ensure the best results.

One-Hole Fixing.

DO not assume that because a component is of the one-hole-fixing type one side of it is necessarily connected to the fixing bush. For instance some "on and off" switches have two soldering tags at the back, neither of which is connected to the metal knob which controls the switch. Failure to notice such points may lead to mysterious faults.

Screening by Telephone Wires.

IF telephone wires are parallel, or almost parallel, with an aerial, they screen it to some extent, and thereby reduce its practical efficiency. In the case of transmitting aerials induced currents may be set up in the telephone wires, and telephone subscribers have been known to overhear the transmissions. If the aerial can be erected as nearly as possible at right angles to the telephone wires, the effect of the latter is reduced to a minimum.

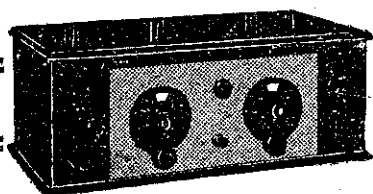
Tips and Jottings

Aerial Pulleys.

IF a pulley is used at the top of the aerial mast for the halliards to run through, it can be the cause of a considerable amount of inconvenience. Owing to its being so exposed to the weather the metal pulley is apt to jam or to break in time through the effects of corrosion, and it not infrequently happens that the supporting rope slips from the groove in the wheel and becomes wedged between it and one of the sheaves.

A practice which avoids all trouble of this kind is to make use of a large shell insulator instead of a pulley. The ropes pass with very little friction over the polished surface of the porcelain and it is practically impossible for a

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