

The Two R. F. Shielded Browning Drake

Continued

micro-condenser, which is particularly suitable. In this condenser the plates are easily removed and replaced. The correct value is obtained by removing two fixed and one moving plate from each. The condensers are fixed by drilling a hole in the centre of the bakelite cover, which can then be secured to the baseboard by a screw and the condenser placed in position. Across the knob of each a slot is to be cut with a hack-saw so that the condenser may be turned with a thin stick cut at the end like a screw-driver. A hole is to be drilled in each R.F. shield directly above the knob of the condenser so that it may be turned by inserting the neutralising stick through the hole whilst the shield is in position.

VARIABLE CONDENSERS.

THE values are .0005 for the first stage and .00025 for the second and detector stages. The three vernier dials should have a ratio of not less than 10 to 1. The two rheostats should be wire-wound, of 30 ohms each.

R.F. TRANSFORMERS.

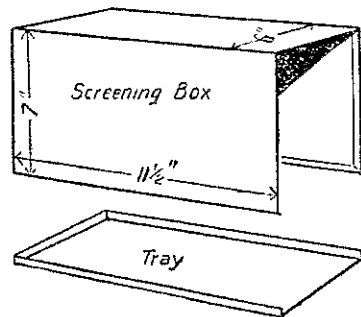
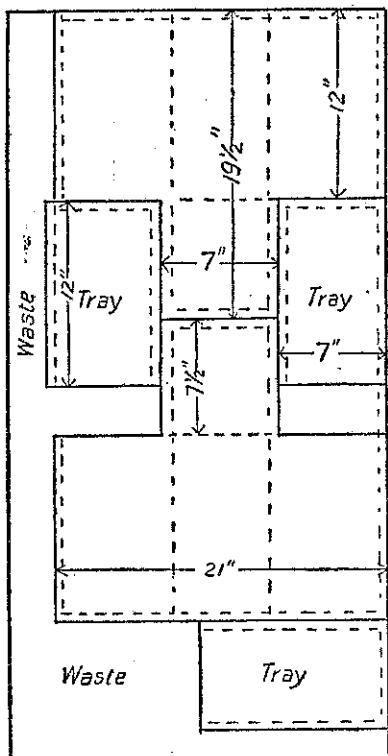
THERE are two R.F. transformers, only the one in the detector stage requiring a tickler. The coils nearly alike as possible, 82 turns of 22's s.w.g. tinned wire on each, for these should both be made as spaced with 24's wire, which is wound off before cementing to the celluloid. When these coils have been fixed in position, examine them very carefully to make sure that no turns have become misplaced so that they are in contact with an adjacent one, as such a happening may cause quite an amount of mysterious trouble.

Three strips of celluloid are put on both inside and outside as for the aerial coil. The coil that is to bear the tickler must have a wider piece of celluloid, half inch, put on at the back, and at the top, above the turns, a piece of celluloid should be put in between the two, and cemented in place. This is to form a thickness through which a 3/16 in. hole is drilled to act as a bearing for the back end of tickler spindle, which is 3/16 in. ebonite rod.

The lower end of each coil is secured to a wooden triangle with screws, the lowest turn of the coil to be a clear inch above the copper tray, so that the celluloid strips must be left projecting from under the turns when winding on the former. THE primary coil for each transformer is made by winding irregularly the prescribed number of turns for the valve in use. These turns are wound irregularly round a former—a bottle will do—slightly smaller than the inside diameter of the coils. The wire to be used is 30's d.c.c. The turns are then bound together in three places with strong thread. In order to thoroughly insulate the primaries from the secondary turns, a 3/16 in. strip of celluloid is fastened round the inside of the lower end of each secondary coil, projecting below about a sixteenth. This is secured by cementing to the upright strips, the joint being made on one of these. The primary coil is then placed inside the lowest turn of each

secondary and secured there by tying to the celluloid strip with fine thread. Without this precaution of insulation there is the possibility of a "short" between the two coils, which are connected to B positive and B negative respectively.

The upright position of the coils and limited space within the shields necessitates a special arrangement for the tickler control. The back end of the tickler spindle works in a bearing in the celluloid strip. The lower side of the spindle is to be 1/4 inch above the top turn of the coil. The front end of the spindle is supported by a bearing consisting of a strip of wood screwed to a cross-



piece fastened to the base. A wooden pulley of 1 to 1 1/2 inch diameter, the latter best, is placed upon the spindle, and another pulley of the same diameter works upon a 3/16 in. spindle near the baseboard as shown, the front end of spindle working in the panel and back end in a small wooden bearing. A strong thread is passed twice round each pulley and fastened to each at its central point on the pulley, which is conveniently done by drilling a hole through diagonally and pulling a loop through, fastening on face of pulley. There can be no slip with this arrangement. The only way to dispense with it is to place the condenser

lower, put the rheostat at top of panel above condenser.

NO doubt some readers will be writing to ask if the shielding can be dispensed with. It cannot. The whole success of this receiver depends upon the shielding, and the extra R.F. cannot give amplification without it. Moreover, the construction of the shielded receiver is paving the way for the addition of the screen-grid valve at an early date. The writer is expecting the arrival in New Zealand of stocks of a special low-capacity R.F. valve, which may be very suitable, and there is shortly to arrive the English type of screen-grid valve. This receiver will need little alteration to accommodate the new valves.

There will probably be queries as to the advisability of reducing the size of the copper boxes. Well, constructors may alter sizes if they wish to do so at their own risk. The nearer the shield goes to the coils, the more damping will there be. After all, we are not building these sets for export, and thinking as much about packing space as efficiency, so why need the size be pinched?

Next week further particulars and helpful diagrams will be given, probably concluding the article.

MATERIALS REQUIRED.

Variable condenser, .0005	12	6
2 Variable condensers, .00025	1	5 0
3 Vernier dials, 10-1	19	6
2 Rheostats, 30 ohms	6	0
2 UX valve sockets	4	6
1 Benjamin socket, sprung	4	6
Fixed condensers, .00025, .001, .0001	7	0
2 Neutralising condensers, max. .000025	13	0
Grid leak, 4 meg. and clips	3	0
1/2 lb. 22's s.w.g. tinned wire	2	3
1/2 lb. 20's s.w.g. tinned wire	1	3
Knob for tickler	1	0
Panel, zinc or aluminium, 19 by 8 1/2	7	6
Copper for shielding	15	0
Connecting wire, screws, etc., etc.	5	0
	£	7 0

QUERIES BY CORRESPONDENCE.

1. Every communication enclosing queries is to be addressed to "Meg-ohm," Box 1032, Wellington, and must be accompanied by a stamped addressed envelope for reply by post.
2. Questions must be written so that a space is left in which the reply may be added.
3. No charge is made for replies.

TIPS AND JOTTINGS

Interference by Trams.

EXPERIMENTS to overcome this kind of trouble have been undertaken in England and in Europe, in co-operation with the tramway and broadcasting authorities, and it is said that the results have been most encouraging, though particulars are not yet forthcoming.

DOUBLE IMPEDANCE.

THOSE constructors who are experimenting with double impedance are recommended to commence with a coupling condenser of a half microfarad, which is the value that is likely to be quite satisfactory. Experiment shows that capacities up to one microfarad may be used with good effect, but the half is a good average, and yields very satisfactory tone. It is quite feasible to run three stages of double impedance, but they should all be of high quality, and the best method of construction would be to perfect one stage before adding another.

MARCONI VALVES.

ALTHOUGH Marconi receiving valves have been widely used in other countries for a considerable time, the first shipment has only recently reached New Zealand. Several different types are now available at average prices.

"Pirates" in Canada.

IN Canada a motor-car round-up of pirates has been quietly proceeding for several months. In some cases the Royal Canadian Mounted Police have proved helpful in tracking offenders.

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What to Buy and Where

ATWATER-KENT RADIO	Frank Wiseman, Ltd. 170-172 Queen Street.
ALTONA & HAMMARLUND-ROBERTS SETS.	Johns, Ltd. Chancery Street.
AMPLION LOUDSPEAKERS	All Radio Dealers.
BREMER-TULLY RADIO	Superadio, Ltd., 147 Queen Street.
BURGESS RADIO BATTERIES.	All Radio Dealers.
CE-CO VALVES	All Radio Dealers.
FADA RADIO	Radio Supplies, 251 Symonds Street.
FEDERAL, MOHAWK, GLOBE	Federal Radio House, 8 Darby Street.
GILFILLAN AND KELLOGG	Harrington's, Ltd., 138-140 Queen Street.
GREBE RADIO	Howie's, Dilworth Building, Custom St. E.
MARCONI ECONOMY VALVES	All Radio Dealers.
MULLARD VALVES	All Radio Dealers.
RADIOLA RECEIVERS	Farmers' Trading Co., Ltd., 110 Hobson Street.
RADIOTRON VALVES	All Radio Dealers.
RELIANCE BATTERIES	Reliance Battery Mfg. Co., Ltd., 90 Albert Street.
PHILIPS VALVES AND APPARATUS	All Good Radio Dealers.

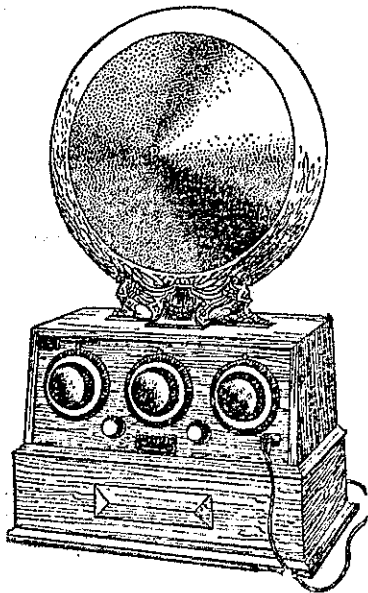
MOUNTAIN CAUSES "DEAD SPOT"

COMPLETELY STOPS TRANSMISSION

Lieutenant H. F. Breckel, of the U.S.S. Delaware, relates his experience of a "dead spot" located whilst attempting to transmit a message whilst at sea off the coast of Cuba. The message was to be transmitted only 150 miles, and the difficulty encountered is related by the Lieutenant in his own words. He says, "I opened up" on about one and a half kilowatts power with the quenched gap spark transmitter and called the station—without results. This procedure was carried out at the correctly specified intervals. I gradually increased my power to full strength with forty amperes in the antenna—and still no answer could I hear! In an interval of listening I heard what I knew to be one of our destroyers calling me from a position that was nearby but to seaward and outside the point defining the entrance to the

bay. The operator said he was in easy communication with the station at Guantanamo and would relay my message for me. This suited me fine, so I gave it to him on reduced power, and then he gave Guantanamo a single call on the same strength of power he used in calling me. Evidently he got him on the first trial, for he relayed my message at once!

"Yet I, with my forty amperes in the antenna, could not get the base after almost an hour's work! This was some dead spot, I concluded. After going off watch I went up to the chart house and looked up the geographical aspects of the situation. Ultimately I reached the conclusion that the innocent-looking mountain range (the Sierra Maestra Mountains) extending between the point where I was located at Guacanayabo Bay to the base at Guantanamo Bay, was probably responsible for the difficulty. I further ascertained that there was known to be a considerable body of iron ore in the portion of the range adjacent to Guacanayabo Bay, and this doubtless was definitely responsible for the failure of the radio signals to get through from my station, while the comparatively low-powered transmitter of the relaying destroyer got the message through perfectly."



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