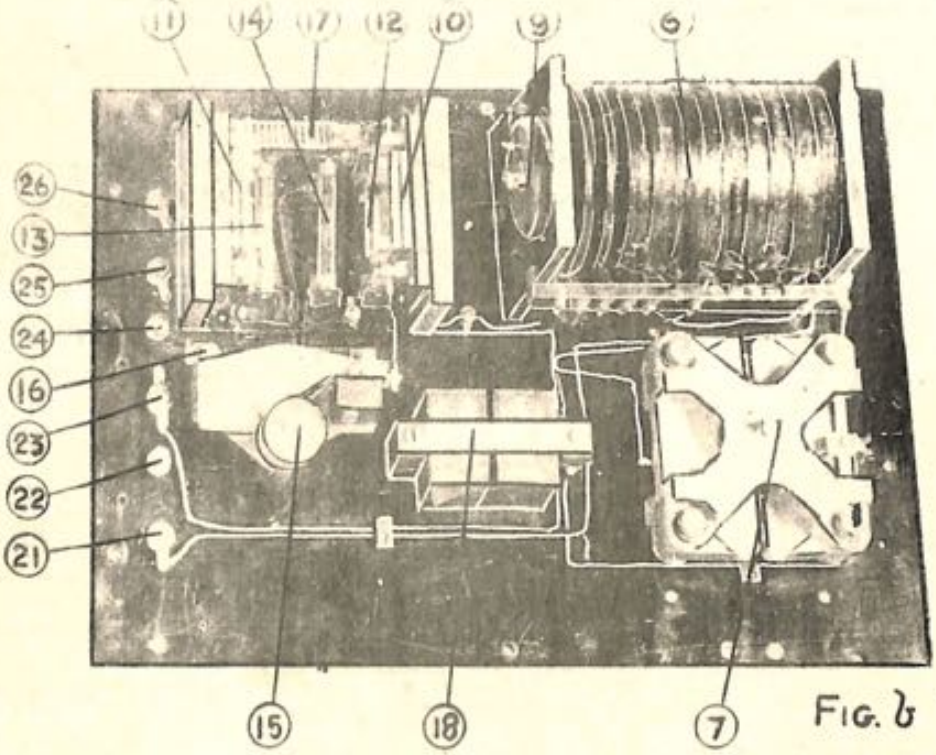
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FIG. 6

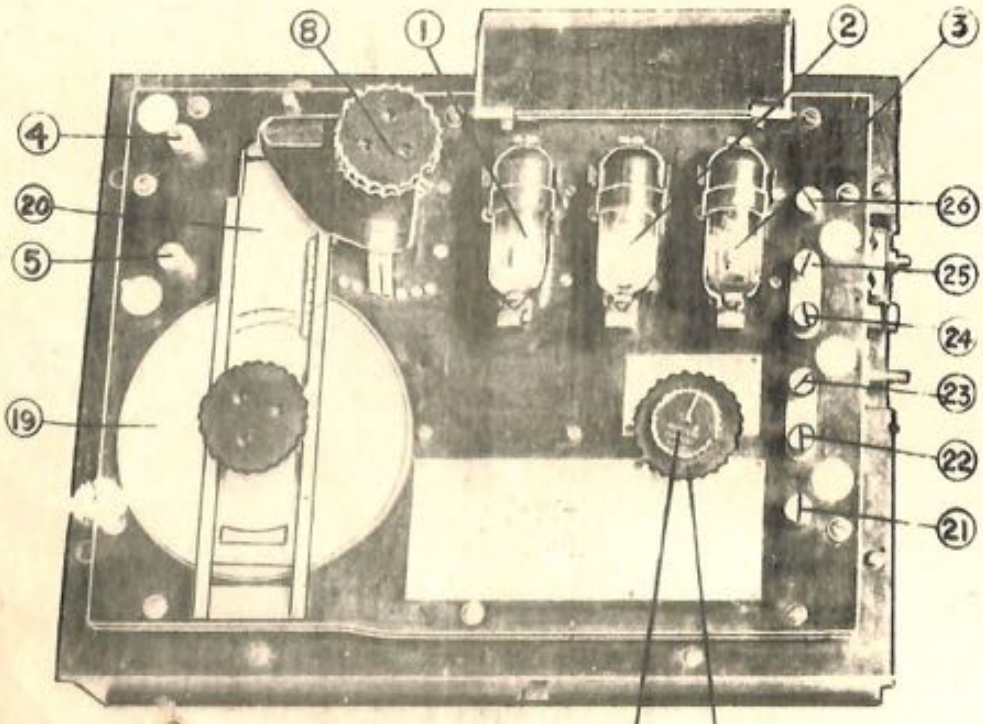
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FIG. C

AMPLIFIER M 3 B.

Date of design:- 1923.
Frequency range:- 30 - 1,800 kc/s.
Where fitted:- Receiver-Outfits CI and MH (See Sub-section DA).
Valves and methods of coupling:- Three MR14.
Two R/F amplifiers (1) tuned choke capacity, (2) resistance capacity.
One anode detector (3) (upper bend).

The first valve (1) has a tuned anode circuit with a variable condenser (7). Attached to the condenser handle is an ivorine disc (19) roughly graduated in metres. The inductance (6) is adjustable in six steps lettered A to F and showing the wavelength range covered in each position. The range of frequencies covered is approximately as follows:-

F 30 - 60 kc/s.	D 110 - 250 kc/s.	B 350 - 800 kc/s.
E 55 - 120 "	C 215 - 500 "	A 715 - 1800 "

Mechanically connected to the inductance range switch (8) is a device (20) which moves an aperture over the ivorine disc so that a different scale becomes visible, according to the amount of inductance in circuit. Half the ivorine disc (19) is graduated, the other half is left blank for the operator to insert the correct adjustment.

A 3 ohm fixed resistor (17) in the positive filament lead to the detector valve(3) makes it operate near the upper bend of its anode characteristic and so ensures "upper bend" anode rectification. The telephones are joined (via the usual external telephone transformer and condenser)to terminals (21) and (22) which brings them in the anode circuit of the last valve in series with the reaction coil (9).

The coupling between the reaction coil (9) and the tuned anode circuit of the first valve (1) is fixed, and the amount of reaction obtained is therefore only dependent on the current through the reaction coil, which can be varied by means of the filament rheostat. This rheostat is in two parts, one of 1 ohm (16) to give coarse adjustment and the other of 0.1 ohm (15) for fine adjustment. If the filament current is small, the current through the valve is small, and hence the value of reaction will also be small. Under these conditions the set will not oscillate and conditions are suitable for receiving I.C.W. or spark. If the value of filament current (and hence of reaction) be largely increased, oscillations will be maintained in the tuned anode circuit and the model can be used as an autodyne to receive C.W. When used as an autodyne, the anode circuit of the first valve must be slightly detuned (see Admiralty Handbook of W/T (1931), paragraph 570).

Reception of Low Frequency Waves.

In order to receive waves of the order of 16 kc/s. (e.g., Rugby) a No.7 condenser (27) (if necessary in parallel with a No.12) can be fitted between the anode clip of the first valve (1) of the MKP and the positive H.T. terminal (23) as shown in the sketch. This merely places the additional capacity in parallel with the variable condenser (7), hence increasing the range of L.C. values which can be covered by the tuned anode circuit.

In many cases it has been found that M3B will oscillate on 16 kc/s. and that the use of a separate heterodyne can therefore be dispensed with. It is pointed out, however, that if it is found necessary to over-run the valve filaments to make the model oscillate on this wave, the life of the valves will be shortened and a separate heterodyne should therefore be used. It will also be found that a separate heterodyne assists in cutting out interference, and in obtaining improved reception, since this obviates the necessity of detuning the tuned anode circuit, which is the disadvantage inherent in autodyning. When using a separate heterodyne the ring coupling coil of M5 should simply be laid on the top of the model.

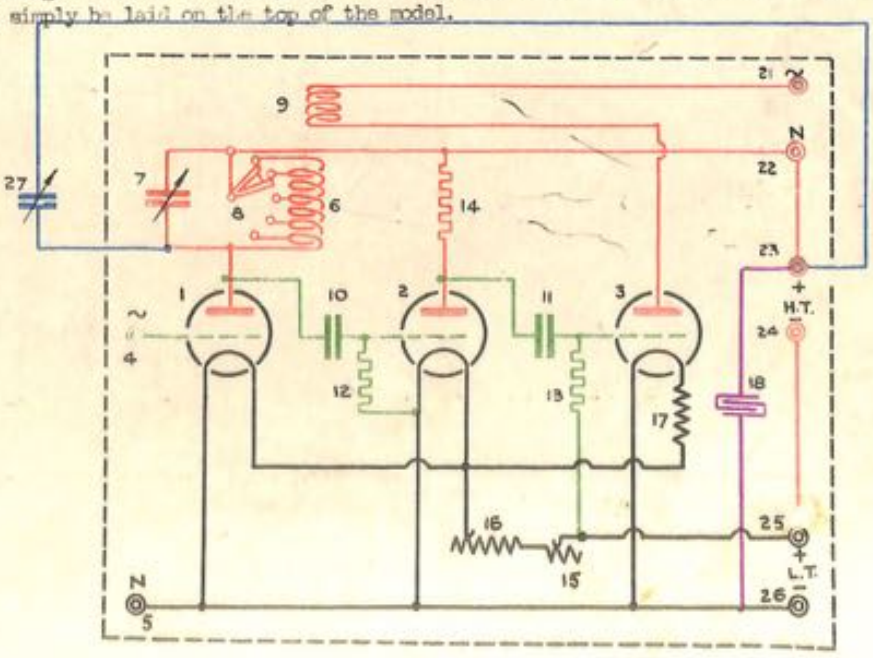

Fig. 0