SUB - SECTION

RG

TYPE 38S PAGE RG2

TYPE 38 S

Transmitter	38-L/T	36-H/F(M)	38 Low Power	40	37
Date of design.	1924	1930	1924	1929	1930
Frequency Range.	100 – 1300 kc/s.	5700–25000 kc/s.	100 – 1300 kc/s.	88 – 222 kc/s	100 – 222 kc/s.
Power Supply.	Two 3 KW. motor alternators.	Two 3 KW. motor alternators.	Two 1½ KW. motor alternators.	30 volt. battery	Two 3 KW. motor alternators.
Valves used.	One NT2?B Two NT2.	One NT4A Two NT2	One NT1	Spark	Spark.
Associated Wavemeters.	1492B or G9	G12 or G8 and G7	1492B or G9	1492B or G9	1492B or G9
Approximate range in miles.	300	World Wide at times.	100	40	100
Reference page.	RG5	RG7	RG8	072	095

Type 38S is a medium power valve transmitting set arranged in panels as shown in Figure j. The panels with the exception of the 38 Low Power and 39A transmitting upper, are identical with those fitted with Type 37S. Panel 39A transmitting differs from panel 36A transmitting, by modifications made for connections and switches to the panel 38 Low Power, but the principles of the circuit and the components are the same. Where the F/T panel 22B is fitted, the other panels are modified, and are distinguished from the earlier design by titles 36A and 39A.

The set is fitted in the main W/T offices of Flotilla Leaders.

POWER SUPPLY

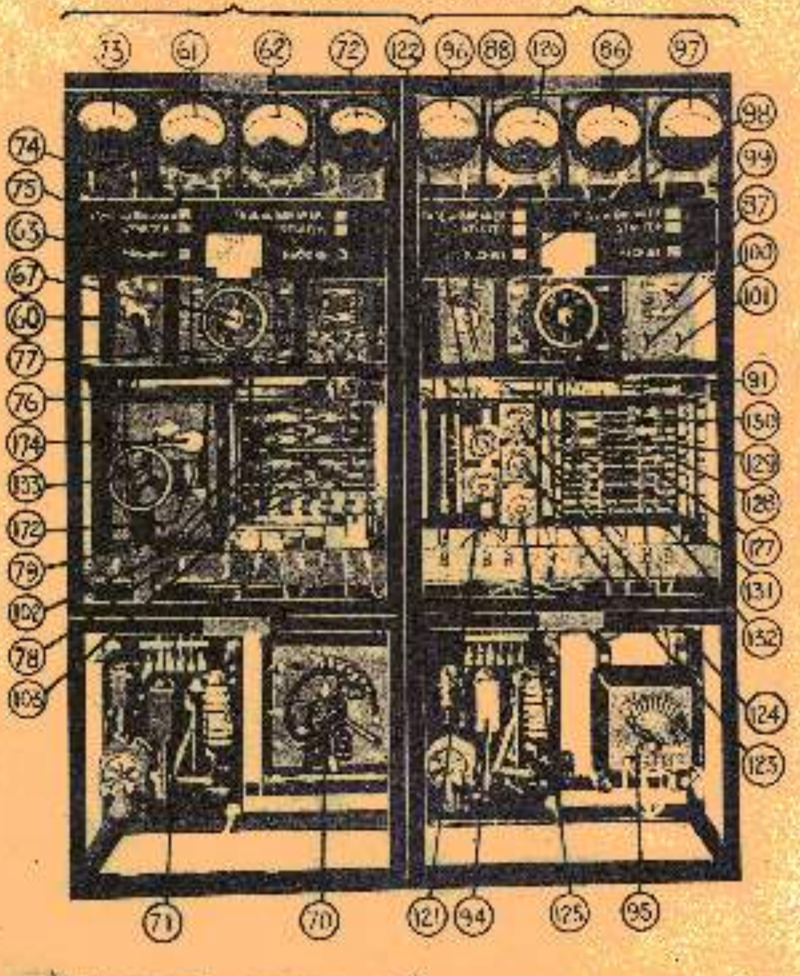
D.C. Supply. The D.C. supply of Type 38 differs from that of Type 37 principally in the fitting of duplicate machines and the use of power boards. These boards contain the controlling and indicating instruments of the four machines, their change-over switches, and control switches for the various D.C. supplies required in the W/T office. Their titles are Board 2Q supply 3 KW upper and lower, and Board 2Q supply 1½ KW. upper and lower.

A ring main C.O.S. (133) is fitted on board 2Q supply 3 KW., and is fed from either side of the ring main. Connected across this C.O.S. is a bobbin (173) lamp (174) and cut out (172).

When the C.O.S. is connected to either ring main breaker, the bobbin (173) operates a mechanical arm which locks the switch. The lamp (174) is in series with the bobbin (173) and it also indicates the C.O.S. (133) is alive. It is therefore necessary to break the ring main breaker before the C.O.S. (133) can be operated. This C.O.S. (133) supplies the two main busbars of the supply boards. The main busbars supply the 8 pole change-over switches (87) (91) for the two 3 KW. motor alternators (85) (88), and the two 1½ KW. motor alternators (179) (180), and their respective automatic and hand starters. In addition the five D.P. switches (121) to (125) fitted on board 2Q supply 1½ KW. are connected to the busbars. These switches control supplies to:--

(1) Lights.
(2) Board 2Q Controlling.
(3) Radiator
(4) Board 2? Charging.
(5) Circulator and Fan.

BOARD 2Q SUPPLY 3 K.W. UPPER. BOARD 2Q SUPPLY 1½ K.W. UPPER.



BOARD 2G SUPPLY 3 K.W. LOWER. BOARD 2G SUPPLY 1½ K.W. LOWER

FIG. G.

TYPE 38 S
H.T. SUPPLY

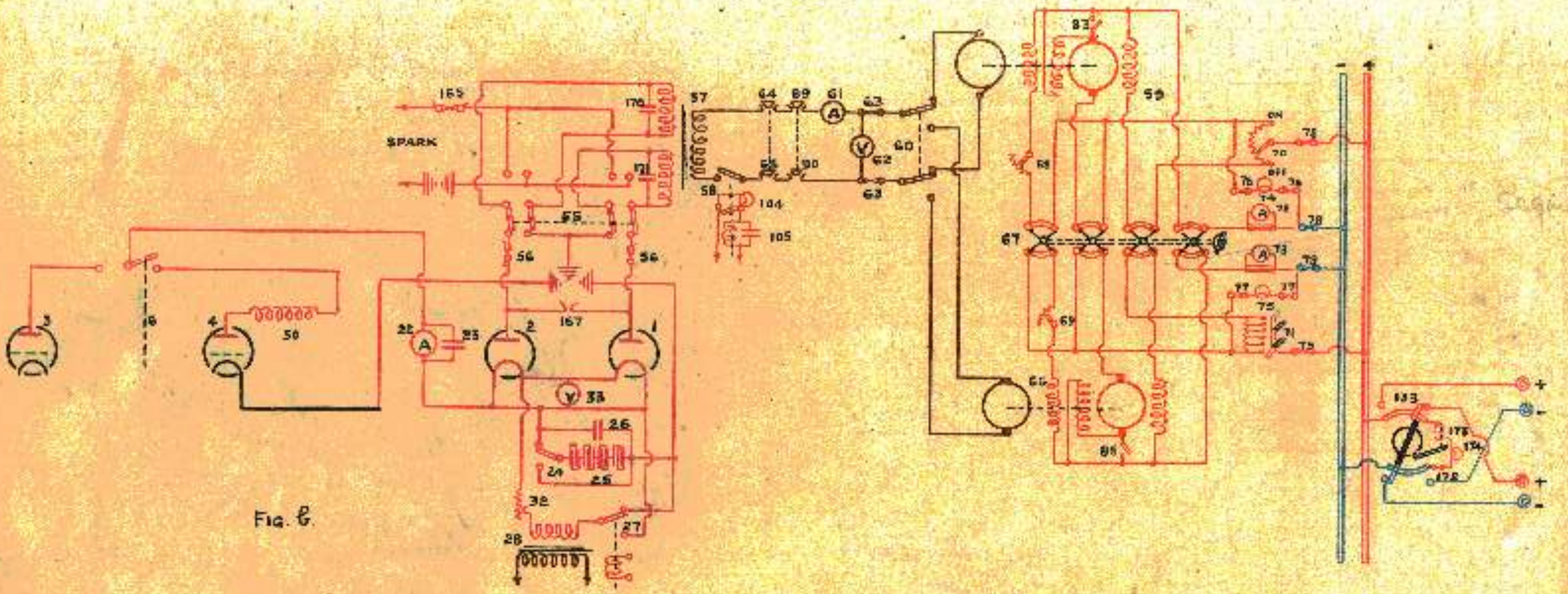


Fig. 6.

Main alternator P.26. The supplies for the hand starter (70) and automatic starter (71) are from the busbars through the fuses (78) and (79) respectively. For details of the hand starters see sub-section M3 and for the E size automatic starters see page M49.

An 8 pole C.O.S. (87) connects the starters (70) (71) to the motor alternators (83) (84) and enables either starter to be used with either machine. It will be noted that both machines can be run simultaneously but only the A.C output of one can be connected to the transformer (57) at one time by the A.C. C.O.S (60). The motor ends of the machines are completely isolated when the C.O.S. (87) is in the "off" position. The machines and starters are numbered 1 and 2, the automatic starter always being No.1 starter.

Indicating lamps (74) (75) are connected between the armature terminals of each starter and the negative fuses (78) (79). The lamps are situated behind a glass slide, which is moved by an arm of the C.O.S (87) and indicates the combination of fuse, starter, and machine, or the "off" position. When the C.O.S (87) is in the "off" position the indicating lamps (74) (75) will burn at full brilliancy immediately either starter commences to operate.

The D.C. ammeters (76) (77) are connected between the fuses (78) (79) and the motor field, and indicate the input current.

The regulators (68) (69) are connected in the alternator field and control the output voltage.

This machine is also fitted with Type [illegible] for the main A.C. supply and with Type 28 for the filament A.C. supply.

The field of some of the alternators have compound coils which can, when necessary, be cut out by removing an insulation bush ([illegible]) or ([illegible]) between the common negative and armature terminals, and screwing the two terminals together. These compound coils are used when machine is fitted for Type [illegible] and Type [illegible].

Filament Alternator 1½ kW. The ½ kW motor alternators (178) (180) are usually of the inductor type. The D.C. supply to the starters (94) (95) and 2 pole C.O.S. (96) is from the main busbars.

The D.C. circuit for the starters (94) (95), C.O.S. (96), and the two 1½ kW. alternators (178) (180) is similar in every respect to that of the main 2 kW. alternators.

A.C. Supply. The main A.C. supply is from either of the 8 kW. motor alternators (60) (98) and is connected to the primary of the transformer (57) by the A.C. C.O.S. (82). In other respects the circuits is the same as for Type 370 and is described on page ~~249~~ RF3.

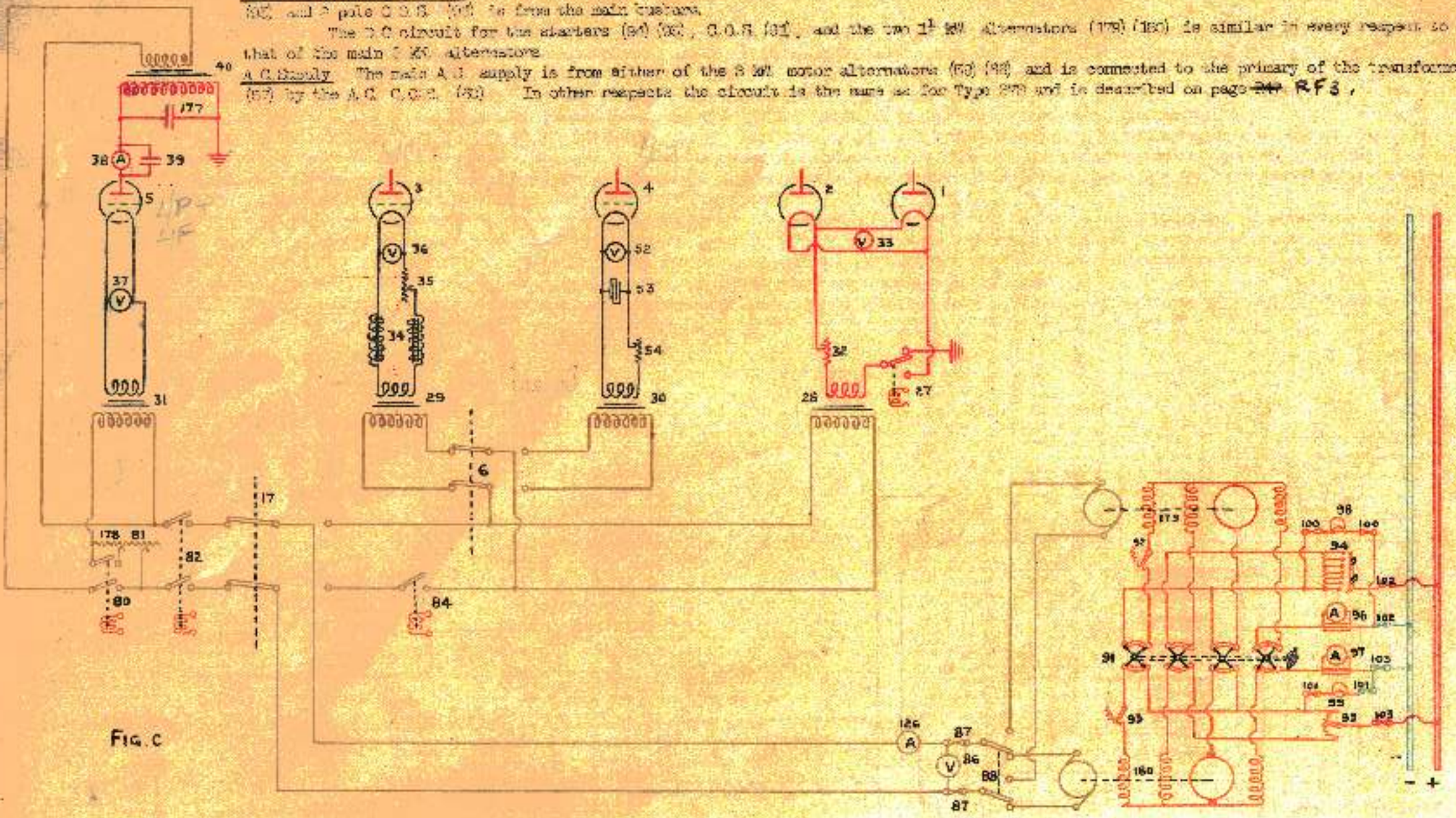


FIG. C

TYPE 38 S

TRANSMITTER 38, L/F.

Wave form	Method of producing oscillations	Nature of circuit	Grid excitation	Feed	Aerial excitation	High oscillating potential electrode.
C.W. and I.C.W.	Self	Tuned circuit between anode and grid	Direct inductive	Series	Direct inductive	Filament

Transmitter 38 L/F is the main L/F transmitter in Type 288. The circuit is described in Admiralty Handbook of W/T (1931) paragraph 821, figure 284.

Except for switching arrangements to the transmitter 38 Low Power, the transmitter 38 L/F is similar to 2K L/F and is fully described on page [illegible]. The switching arrangements only will therefore be explained. They are controlled by a 10 pole C.O.S. (17), one pole of which, being provided for a 20 volt warning circuit, is now usually not used.

H.T. Supply. The H.T. supply for the L/F valve (3) is identical with that in transmitter 2K L/F.

Filament Supply. The A.C. filament supply is connected direct to two of the centre contacts of the C.O.S. (5) which connects it either to the C.O.S. (6) for the L/F and H/F filament transformers (29) (33) or to the transmitter 38 Low Power. With transmitter 2K L/F the A.C. filament supply is direct to the C.O.S. (6).

Oscillatory circuit. The grid and filament of the L/F valve (3) are connected to the two highly insulated contacts of the C.O.S. (17) which connects them when the C.O.S. is in the "Main" position, to the fixed taps of the tapping coil (18). The grid leak (19), condenser (20) and ammeter (21) are connected to a centre contact of the C.O.S. (17) and are therefore used for either "main" or "L.P.A."

The earth side of the aerial ammeter (16) is taken to a centre contact of the C.O.S. (17) which, in the "Main" position, connects it to earth via another contact of the C.O.S.

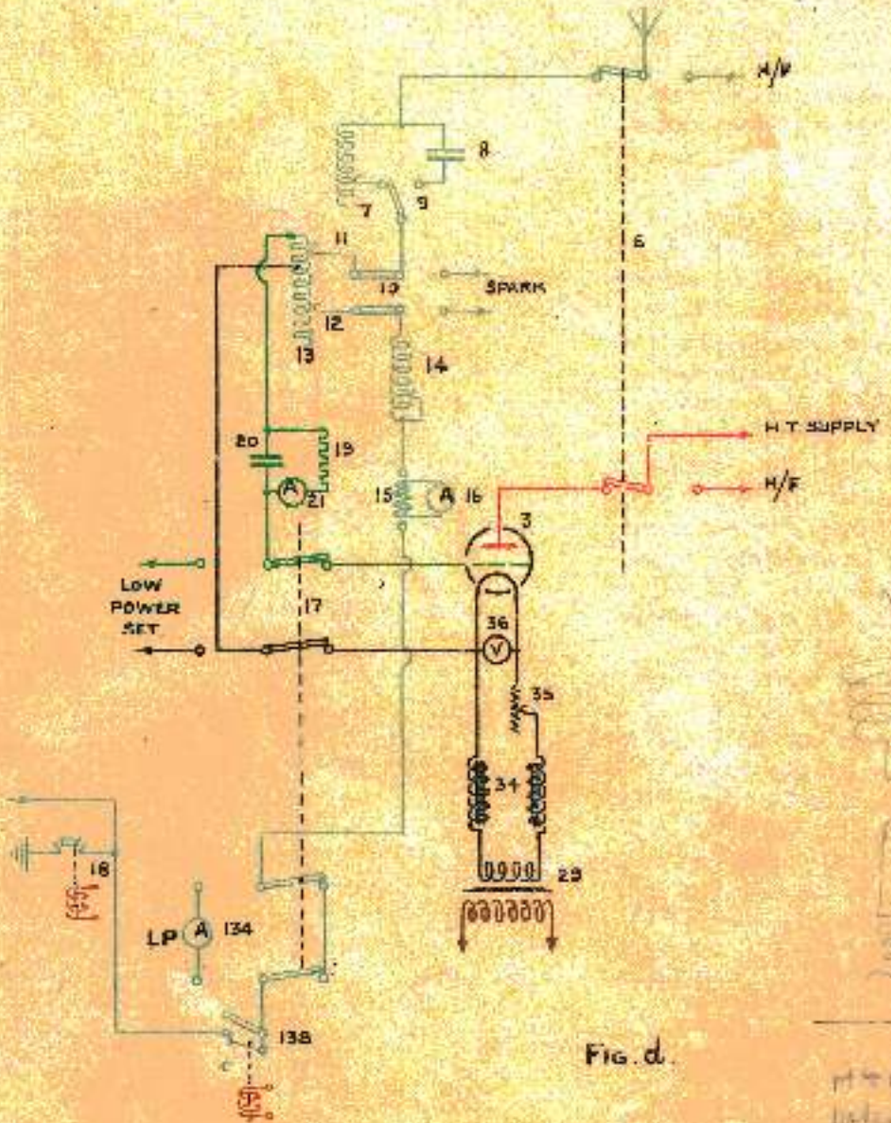


Fig. d.

RG6
~~R62~~

TYPE 38 S

TRANSMITTER 3Q. LOW POWER.

Wave form	Method of producing oscillation.	Nature of circuit	Grid excitation	Feed	Aerial excitation	High oscillating potential electrode.
I.C.W.	Self	Tuned circuit between anode and grid.	Direct inductive	Series	Direct inductive	Filament

Transmitter 3Q Low Power is an attachment to Type 38, and is fitted in panels upper and lower alongside panels 3Q transmitting as shown in Figure 3. It occupies the same position in Type 38 as transmitter 4R does in Type 37. As no rectifier unit is provided, only I.C.W. can be transmitted.

A.C Supply. The A.C supply is from either of the 1½ KW. motor alternators (178) (180). The C.O.S (17) connects the A.C supply to the filament transformer (21) and H.T transformer (40). It will, therefore be noted that the 1½ KW. machines only, are used for 3Q. Low Power.

A magnetic switch (60) is a double pole break in the A.C supply. One contact of the magnetic key (60) makes and breaks the A.C supply to the transformer (40), the other shorting part of the rheostat (81).

The rheostat (81) is connected in the A.C. supply to the filament transformer (21). It has two variable contacts, one of which controls the filament voltage on the valve (5) the other (179) controls the amount of resistance shorted by the magnetic key (60). The resistance which is shorted acts as a compensating device similar to the Type 3F L.F.A. (see page RF11). When the magnetic key (60) is closed, the primary of the H.T. transformer (40) is connected to the A.C supply. This puts the filament of the valve (5) but as part of the filament resistance is shorted by the magnetic key the valve filament current remains constant.

H.T Supply. The H.T supply is from the secondary of the H.T. transformer (40), one side of which is earthed. The transformer is a 2½ - 1 step up and supplies a voltage suitable for the anode of the [illegible] valve (5). A condenser (177) is connected across the secondary as a R/F by-pass, and to protect the transformer.

The ammeter (78) indicates the anode current, the condenser (82) connected across it, is a R/F by-pass.

Oscillatory circuit. The grid and filament of the valve (5) are connected to two highly insulated contacts of the C.O.S. (17). This C.O.S. connects them to the tapping coil (13) grid leak (30) condenser (20) and ammeter (78), thereby using the same oscillatory and aerial circuit as the transmitter 3Q L/F. In addition the 3Q Low Power has its own aerial ammeter (104) which is connected in the circuit by the C.O.S. (17).

Tuning. Although the transmitter 3Q Low Power uses the same oscillatory and aerial circuits as the 3Q L/F, the tuning adjustments are not quite the same, due to the difference in the grid-filament capacities of the [illegible] valve (2) and [illegible] valve (5).

Tuning operations are carried out in the same way as for 3F L/F (see page ~~RF9~~ RF11).

D.C Auxiliary Circuits. The D.C auxiliary circuits are described on page ~~R29~~ R29.

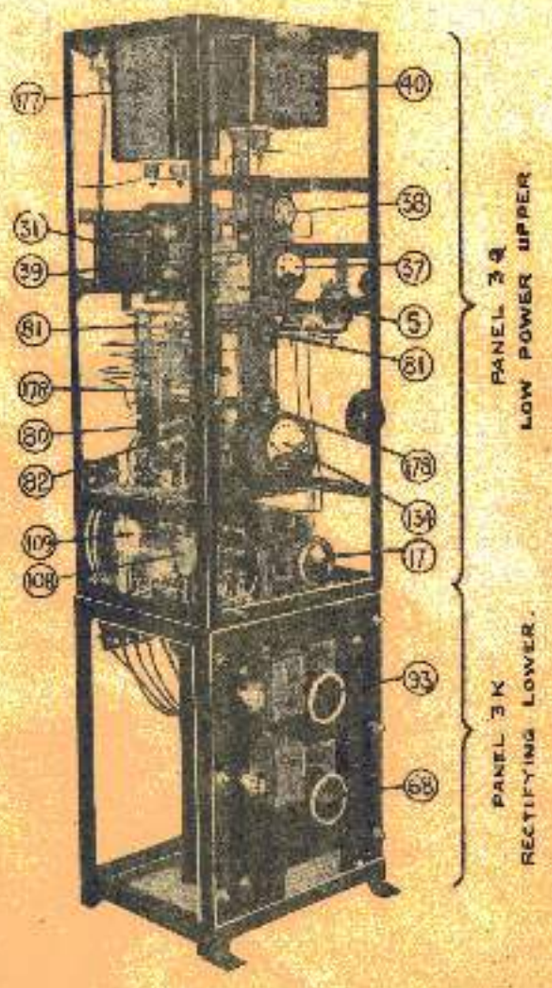


FIG. 6.

TYPE 38 S

TRANSMITTER 3 Q. LOW POWER.

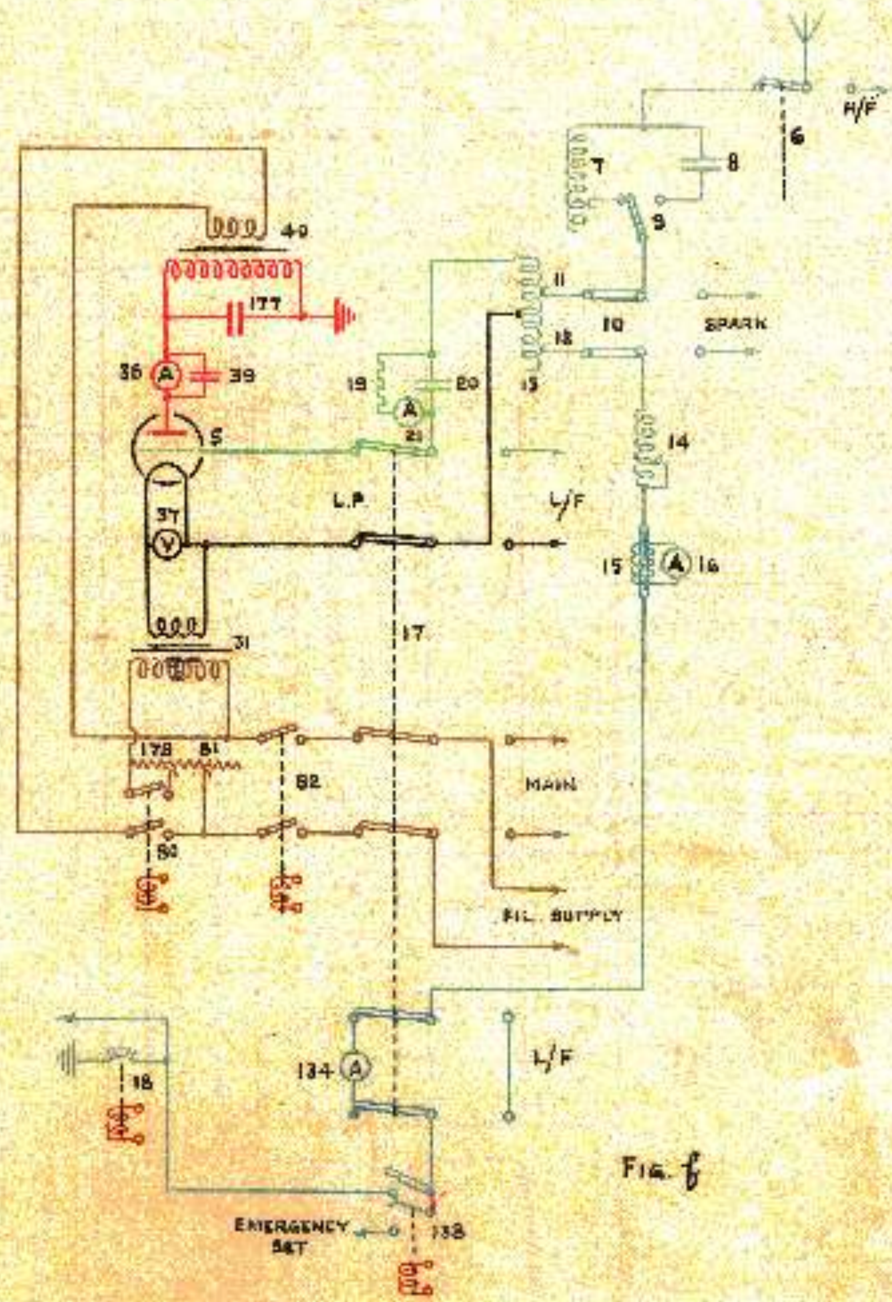


Fig. 6

TRANSMITTER 3K H/F.

Transmitter [illegible] is the [illegible] transmitter fitted to Type [illegible] and Type [illegible]. It is fitted in a similar position in each set and all circuits are identical in each case. The transmitter is described as fitted with Type [illegible] on page ~~R44~~ RF7

TRANSMITTER 6D.

Transmitter 6D is an emergency transmitter working from a [illegible] volt battery. It is fitted in various transmitting sets, including Type [illegible], and is coupled in each case to the aerial circuit of the set in question. The transmitter is fully described on page [illegible]

TRANSMITTER 8T.

Transmitter [illegible] is a spark attachment fitted in Type [illegible] and Type [illegible]. A full description is given on page [illegible].

BATTERY OUTFIT AND CHARGING ARRANGEMENTS.

The battery outfit and charging arrangements of Type [illegible] depend on the type of receiver valve used, as shown on page [illegible].

With dull emitter valves outfit [illegible] is supplied (see page [illegible]). With bright emitter valves outfit [illegible] is supplied, with charging board [illegible] and the generators (see page [illegible]).

RG 8
~~R64~~

TYPE 38 S

D.C. AUXILIARY CIRCUITS

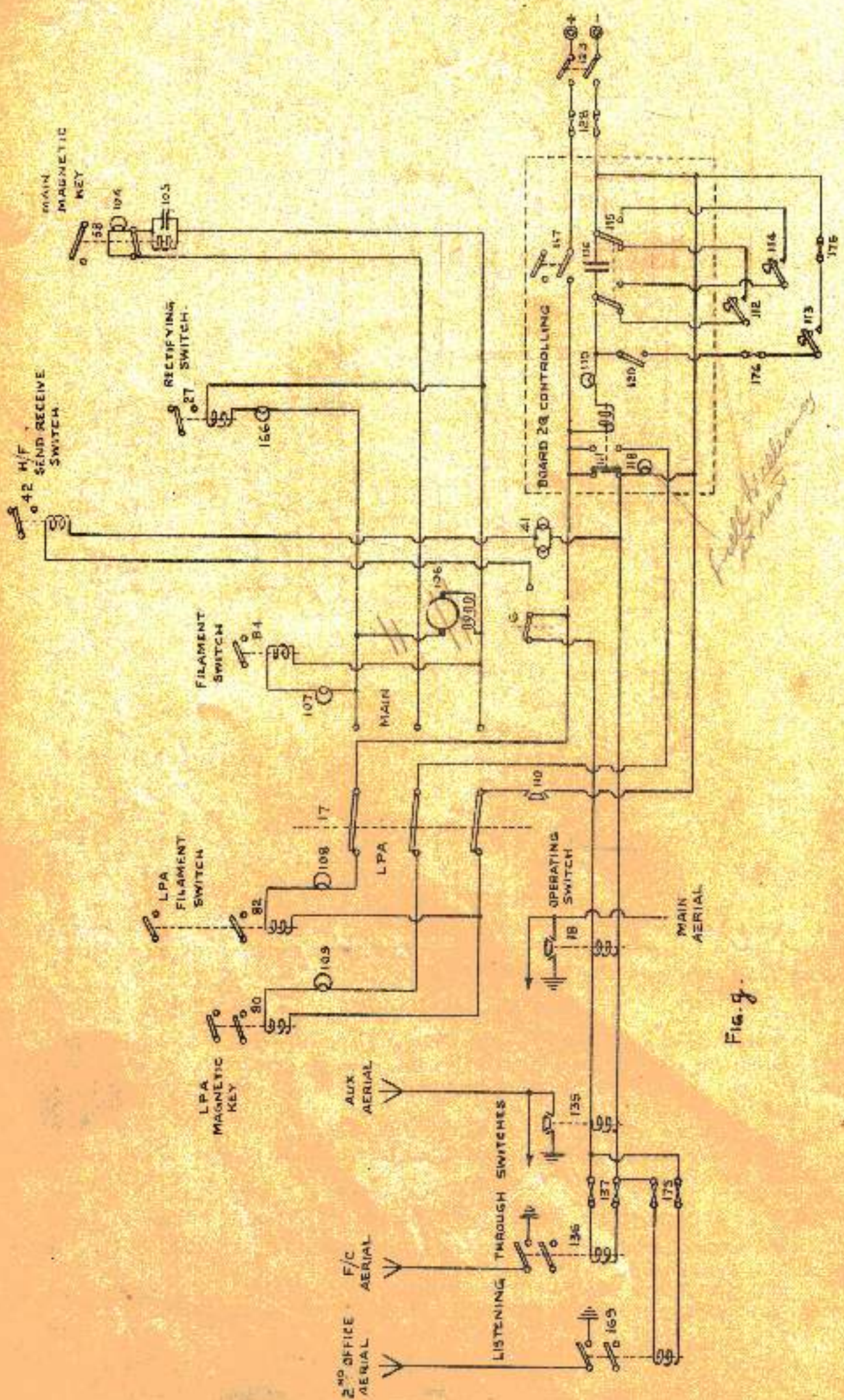


Fig. 9.

RG9
~~R65~~

TYPE 38 S

D.C. AUXILIARY CIRCUITS.

The D.C. supply for the auxiliary circuits is from the main busbars and is connected to board 32 Controlling by a D.P. switch (128) through a pair of fuses (126). The control switch (117) consists of two single pole switches mechanically linked. One contact controls the D.C. supply to all auxiliary circuits, the other is used for a 20 volt warning circuit to the 2nd M/T office in cases where the 2nd. office listening through switch (129) is not fitted. With the C.O.S. (17) in the "main" position, the filament switch (94) rectifying switch (92) and blower (106), are operated immediately the control switch (117) is made. In the "low power" position the magneto switch (112) is the only switch to operate. In both cases the safety door contact (110) must be closed.

The key C.O.S. (115) is similar to the control switch (117) in design. This switch connects either morse key (112) or (114) in the circuit and allows the set to be operated from either receiving key. In addition the morse key (112) fitted in the remote control position can be connected in the circuit by the switch (120), and will operate with the key C.O.S. (115) made to either key (112) or (114). A pair of fuses (124) is connected in the supply to the remote control key (113). The key condenser (116) is connected across the key C.O.S. (115) and is therefore used with either morse key. The morse key in use does not actually operate the magnetic keys and switches as in Type 7, but completes a circuit through the bobbin and lamp (119) of the master key (111). When the master key (111) is at rest it shorts the bobbins of the listening through switches (129) (125) (128) and operating switch (47) and the circuit is directly through the lamp (112) which burns at full brilliancy. When the master key is made, (providing the safety contact (110) is closed) it completes a circuit through either the magnetic key (50) for the L/F and H/F transmitters or the magnetic key (50) for the low power transmitter. The lamp (112) is then in series with the bobbins and will not burn at full brilliancy. The magnetic key in use depends on the position of the C.O.S. (17). The shunt on the listening through switches (129) (125) (128) and operating switch (47) is also removed, and these switches operate.

The listening through and operating switches operate for main L/F and low power but when transmitting on L/F the C.O.S. (8) connects the H/F send-receive switch (49) in line. Two lamps (41) are connected in the supply to the bobbin of this H/F send-receive switch (49) to compensate for the resistance of the switch bobbins not in use. The D.C. listening through switch (127) and 2nd. office listening through switch (129) are each connected to a pair of fuses (127) and (125) fitted in the respective M/T offices.

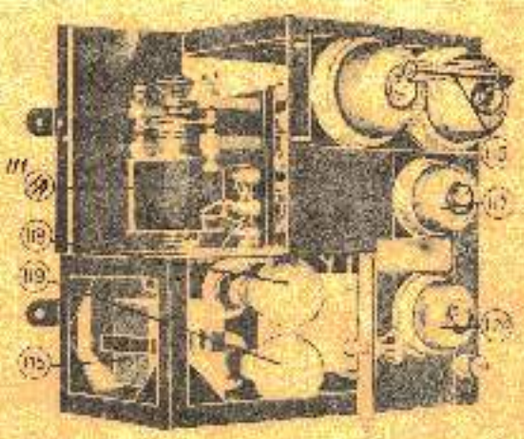


FIG. 6.

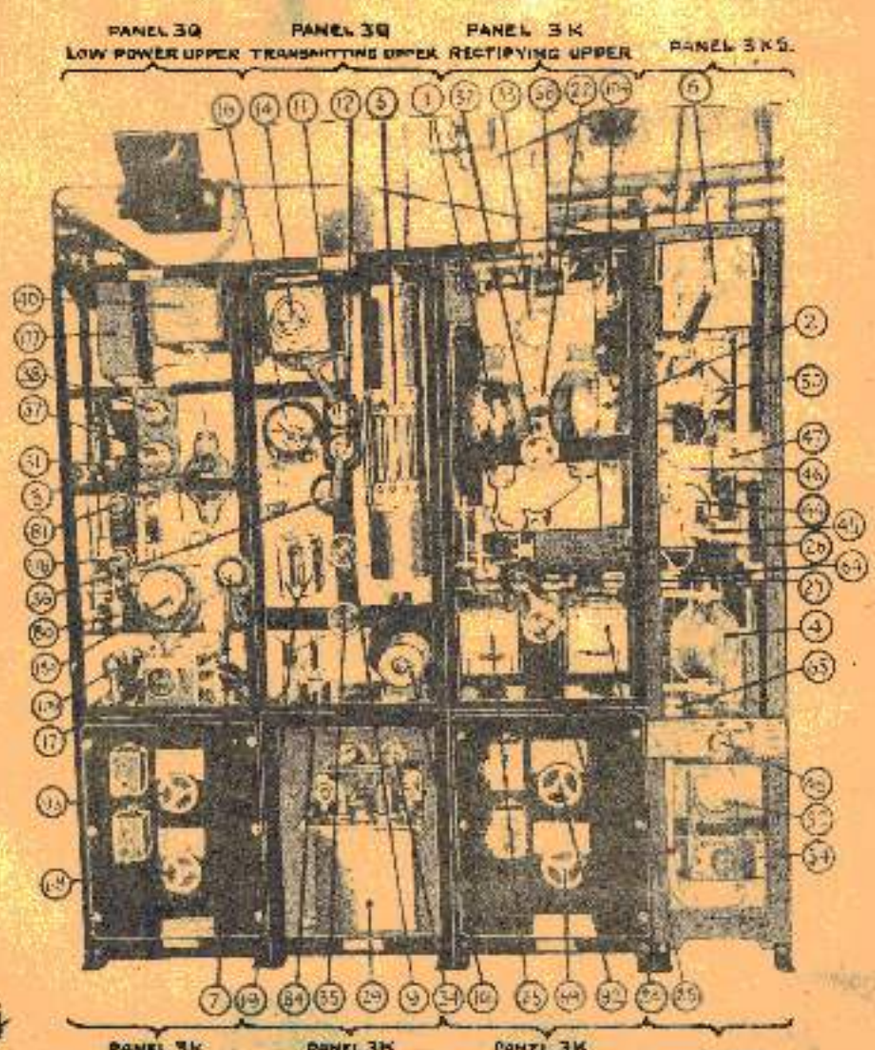


FIG. 7

RG 10
R66

TYPE 385