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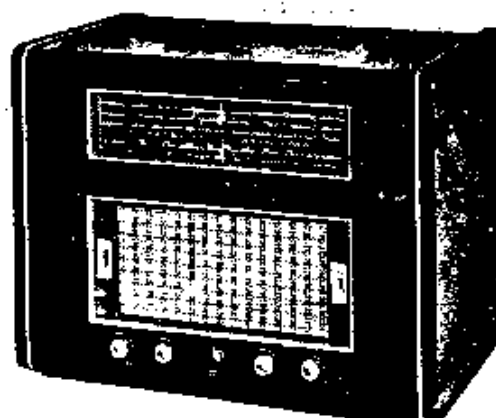
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SERVICE NOTES

for the radio-gramophone

HX538 A



R14997

1953 For A.C. mains supply

GENERAL

Waveranges:

SW2a : 11.4 - 20 m (26.3 - 15 Mo/s)
SW2 : 20 - 59.5 m (15 - 5.05 Mo/s)
SW3 : 59 - 187 m (5.1 - 1.6 Mo/s)
M.W. : 185 - 580 m (1622 - 517 kc/s)

Controls:

From left to right:

1. Knob : Tone control
Lever: Bass-switch
2. Knob : Volume control+mains switch
3. : 3 position aerial-switch
4. Knob : Waverange switch+ P.U.-switch
5. Knob : Tuning

Valves:

B1 : EF41
B2 : ECH81
B3 : EBF80
B4 : EBC41
B5 : EL84
B6 : EZ80
B7 : DM71

Dimensions:

Length : 57 cm } knobs
Depth : 39 cm } included
Height : 45 cm }

Weight : 20 kg

Diallamps:

L1 : 8045D - 00
L2 : 8045D - 00

Printed in Holland

I.F. : 452 kc/s

Mains voltage:

90 - 110 - 125 - 180 - 200 -
220 V a.c.

Consumption:

Approx.: 57 W (220 V a.c.)
without motor
Approx.: 67 W (220 V a.c.)
with motor running

Loudspeaker:

9768 (Z = 5 Ω)

Record-changer:

A.G. 1000

P.U. head:

A.G. 3010

Bandwidth:

The I.F. bandwidth (1:10) measured from g1 of B2 is about 10.5 kc/s. The "overall" bandwidth (1:10) measured from the aerial socket at 1000 kc/s is about 9kc/s and about 8.5 kc/s at 550 kc/s.

List of illustrations:

- Fig. 1 : R.F. and oscillator circuit for each position of the waverange switch.
 Fig. 2 : Location of trimming points on the dial.
 Fig. 3 : Cable-drive.
 Fig. 4 : Switch-wafers and coil connections.
 Fig. 5 : Circuit diagram.
 Fig. 6 : Wiring diagram (under)
 Fig. 7 : Wiring diagram (above)
 Fig. 8 : Mains transformer.

TRIMMING THE RECEIVERA. The I.F. Part.

1. Set the waverange-switch to M.W.
2. Turn the variable capacitor to minimum capacity.
3. Set the volume control to maximum.
4. Unscrew the I.F. ironcores almost entirely.
5. Connect a voltmeter via a trimming transformer to the extension loudspeaker socket.
6. Apply to g1 of B2 a modulated signal of 452 kc/s, via a capacitor of 33000 pF.
7. Trim the I.F. circuits in the following order:

4th I.F. circuit	S36 - C48	(coil N)
3rd I.F. circuit	S34 - C47	(coil N)
1st I.F. circuit	S30 - S31 - C44	(coil M)
2nd I.F. circuit	S32 - S33 - C45	(coil M)
3rd I.F. circuit	S34 - C47	(coil N)

After the last circuit has been trimmed the cores of the I.F. coils must be left as they are.

8. Seal the cores.

Note: The iron cores of the I.F. bandfilters have been sealed with "Vaseline compound" (See list of parts and tools). This compound can easily be removed in the cold state with the aid of a screw-driver. Heating of the core damages the core holder and makes trimming impossible.

B. R.F. and oscillator circuits.

Trimming is done with the aid of trimming points on the dial (See fig. 2). There is no need to take the chassis out of the cabinet. Before starting to trim, check the adjustment of the pointer. With the variable capacitor at minimum, the pointer must be on the extreme left trimming mark on the dial. If not, release the pointer from its cable and adjust it to the correct position.

For all waveranges the following applies:

1. Volume control to maximum.
2. Tone Control in the mellow position.
3. Connect a voltmeter via a trimming - transformer to the extension loudspeaker socket.

Trim as indicated in the following table, strictly observing the order given:

1.	Waverange switch in position	M.W.	SW3	SW2	SW2a
2.	Screw fully in	-	-	-	S6 S13
3.	Switch SK4 into position	ant.	-	-	-
4.	Pointer on trimming point by means of tuning knob	2	2	2	2
5.	Apply modulated signal of to aerial socket via normal dummy aerial	550 kc/s	1.72 Mc/s	5.41 Mc/s	15.24 Mc/s
6.	Trim for maximum output voltage	S29 S18 S12	S27 S15 S10	S25 S14 S8	S22 S13 S6
7.	Pointer on trimming point by means of tuning knob	1	1	1	1
8.	Apply modulated signal of to aerial. Socket via normal dummy aerial.	1630 kc/s	5.15 Mc/s	15.1 Mc/s	26.4 Mc/s
9.	Trim for maximum output voltage	C29 C14 C8	C28 C13 C7	C25 C12 C6	C54
10.	Repeat the points	4-9	4-9	4-9	4-9
11.	Seal the cores and trimmers ...	S29 S18 S12 C29 C14 C8	S27 S15 S10 C28 C13 C7	S25 S14 S8 C25 C12 C6	S22 S13 S6 C54

REPAIRS AND REPLACEMENTS

Removing the record-changer from the cabinet.

1. Remove the rear panel and bottom plates.
2. Disconnect the connections of the record-changer from the chassis.
3. Remove the wooden rearpanel (upper part)
4. Unscrew the mounting shelf from the cabinet.
5. Remove the valve EZ80 (B6) from its holder.
6. Withdraw the mounting shelf and recordchanger carefully from the cabinet.

Removing the chassis from the cabinet.

1. Remove the record-changer from the cabinet (see above).
2. Unsolder the loudspeaker connections.
3. Remove the spring for fixing the valve 1M71 and remove this valve.
4. Disconnect the plug from the switch SK4.
5. Remove the cable from the waverange indicator.
6. Remove the knobs.

7. Disconnect the following leads:
 - a) The powercard of the motor of the record-changer
 - b) The supply card of the diallamps.
8. Release the pointer from the driving cable and remove this cable from the connecting plate H. (See fig. 3)
9. Unscrew the 4 bottom screws from the chassis and carefully withdraw the chassis from the cabinet.

Cable drive.

The path and the lengths of the cables are indicated in fig. 3, the variable capacitor being set to maximum capacity.

A. Variable capacitor drive.

1. Remove the chassis from the cabinet.
2. Remove the large cable drum (3 screws)
3. Remove the broken cord.
4. Assemble the new cord "A-B"
5. Push the nipple G of the cord "A-B" in the slit "g" of the small drum.
6. Turn the drum till the slit "g" is underneath.
7. Fasten the drum with a nail.
8. Pass the end "A" $3\frac{1}{2}$ x in an anti-clockwise direction around the drum and $2\frac{1}{2}$ x in an anti-clockwise direction around the tuning spindle.
9. Place the cable guide in position.
10. Pass the cord around the capacitor drum and fix it temporarily with a crocodile clip.
11. Pass the end "B" $3\frac{1}{4}$ x in a clockwise direction around the tuning spindle.
12. Place the cable guide in position.
13. Pass the cord around the pulley and the capacitor drum.
14. Hook the spring in the cord loops, pass the ends through the drum opening and lay one end in the right direction around the pin of the drum.
15. Fix the spring on its bracket and remove the crocodile clip.
16. Remove the nail and replace the large cable drum.

B. Pointer drive on chassis.

1. Remove the chassis from the cabinet.
2. Remove the broken cables.
3. Assemble the new cables (see fig. 3).
4. Push the nipple "a" of the cable "C" in the slit "a" of the cable drum, pass the cable $1\frac{1}{2}$ x in a clockwise direction around the drum and fix it temporarily with a crocodile clip to any convenient point.
5. Push the nipple "b" of the cable "K" in the slit "b" of the cable drum, pass the cable 3 x in an anti-clockwise direction around the drum.
6. Fix the spring R into the loop of the cable.
7. Fix the loop of cable D to the other end of the spring R and pass the cables around the pulleys.
8. Fix the other end of cable D to the connecting plate E (see fig. 3).
9. Remove the crocodile clip and fix the other end of cable "C" to the same connecting plate H.

B2 Pointer drive in the cabinet.

1. Remove the record-changer of the cabinet.
2. Remove the broken cables.
3. Assemble the new cables.
4. Fix one end of the cable "L" to the connecting plate H and pass the cable around the pulleys.
5. Fix one end of the cable "M" to the connecting plate H and pass the cable around the pulleys.
6. Hook the spring "S" into the loops of the cables "L" and "M".

Mainstransformer

If the original mainstransformer of this apparatus becomes defective, it must be replaced by the standard transformer mentioned in the electrical parts list.

If a mains tension of 180 Volts must be applied to the set, equipped with the standard transformer, it must be applied to the points 1A and 5 of this transformer. In case, the standard transformer has been replaced, the voltage adaptor, mentioned in the list of parts and tools, should also be replaced.

For connections see fig. 8.

CURRENTS AND VOLTAGES

Valves			Va	Vg2(+4)	Vk	Ia	Ig2(+4)
B1	EF41	Pentode	218	80	1.2	2.8	0.7
B2	ECH81	Hexode	246	80	-	2.0	4.7
		Triode	105	-	-	4.3	-
B3	EBF80	Pentode	246	80	-	5.0	1.6
B4	EBC41	Triode	90	-	-	0.58	-
B5	EL84	Pentode	245	242	7.5	45	4.8
			Volts	Volts	Volts	m.A.	m.A.

VC1 = 270 V

VC2 = 246 V

I prim = 255 mA (220 V a.c.).

These measurements have been taken with the Universal Measuring Instrument GM 4257 with the receiver connected to 220 V a.c. and no signal on the aerial socket.

List of Parts and Tools

When ordering always quote:

1. Code number
2. Description
3. Type number of the set

	Description	Code number
	Cabinet	A3 003 35.0
	Rubber grommet (fixing chassis) 4x	A3 642 18.0
	Rear panel	A3 255 43.0
	Knobs (colour MC) 4x	A3 736 57.0
	Lever (bass-switch) 1x	23 952 78.0
	Spring for fixing knobs	28 753 01.2
	Cable drum for waverange indicator	P4 380 02.0
	Waverange indicator disque	A3 406 60.0
	Spring in cable N	A3 646 44.0
	Connection plate	A3 392 73.0
	Ornamental window for DM 71	A3 360 54.0
	Ornamental window for waverange indicator	A3 360 61.0
	Spring in cable L and M	A3 646 14.0
	Knob for SK4 (colour MC)	A3 737 96.0
	Connection piece of Philite for spindle bass-switch	P4 075 62.0
	Spring for fixing AG 1000	49 933 87.0
	Plate for spring AG 1000	49 935 66.0
	Switch wafer SK4	A3 192 32.0
	Voltage adaptor	A3 228 85.0
	Connecting plate (aerial-earth)	A3 382 13.0
	Dial (overseas)	A3 741 41.0
	Dial (mediterranean)	A3 741 45.0
	Connection strip for SK4	A3 406 21.0
	<u>Chassis</u>	
	Bass-switch and P.U. switch	A3 402 44.0
	Nut for fixing potentiometers	49 758 21.0
	Small cable drum	23 644 75.0
	Intermediate wheel	P4 120 03.0
	Large cable drum	23 644 47.2
	Spring in cable drum variable capacitor	A3 646 57.0
	Spring "R" see fig. 3	A3 646 14.0
	Valve holder	B1 505 22.0
	Spring for fixing coilcans (5x)	A3 652 58.3
	Valve holder DM 71	B1 506 70.0
	Dial lamp holder	A3 359 16.1
	Spring for fixing coilcan (1x)	A3 652 92.0
	Spindle for R31+ R32 and R46+R47	A3 432 95.0
	<u>Tools</u>	
	Service oscillator	GM 2882 or GM 2883 or GM 2884
	Universal Measuring Instrument	GM 4256 or GM 4257
	Vaseline Compound	X 009 47.0

S1	-		C6	20 pF	49 005 59.0
S2	-		C7	30 pF	28 212 36.4
S3	-		C8	20 pF	49 005 59.0
S5	1.3 Ω		C9	330 pF	48 203 10/330E
S6	< 1 Ω		C10	180 pF	48 203 02/180E
S7	< 1 Ω		C11	150 pF	48 203 10/150E
S8	< 1 Ω		C12	20 pF	49 005 59.0
S9	8.6 Ω		C13	30 pF	28 212 36.4
S10	1.6 Ω		C14	20 pF	49 005 59.0
S11	< 1 Ω		C15	150 pF	48 203 10/150E
S12	< 1 Ω		C16	68 pF	48 203 02/68E)
S13	< 1 Ω			100 pF	48 203 02/100E)
S14	< 1 Ω		C17	100 pF	48 203 10/100E
S15	1.6 Ω		C18	39 pF	48 203 10/39E
S16	40 Ω		C19	0.22 μ F	48 751 10/220K
S17	3 Ω		C20	2200 pF	48 751 10/2K2
S18	30 Ω		C21	160 pF	48 336 01/160E
S19	2.5 Ω		C22	220 pF	48 203 10/220E
S20	< 1 Ω		C23	56 pF	48 203 02/56E
S21	< 1 Ω		C24	100 pF	48 203 02/100E
S22	< 1 Ω		C25	30 pF	28 212 36.4
S23	< 1 Ω		C26	1500 pF	48 336 02/1K5
S24	< 1 Ω			47 pF	48 336 99/47E
S25	< 1 Ω		C27	330 pF	48 336 02/330E
S26	1 Ω			47 pF	48 336 99/47E
S27	2.6 Ω		C28	30 pF	28 212 36.4
S28	2.6 Ω		C29	20 pF	49 005 59.0
S29	6 Ω		C30	1500 pF	48 206 50/1K5
S30	4.5 Ω		C31	3000 pF	48 429 05/3K
S31	3 Ω		C44	see coils	
S32	4.5 Ω		C45	voir bobines	
S33	3 Ω			véase bobinas	
C44	115 pF		C46	10 pF	48 201 10/10E
C45	115 pF		C47	see coils	
S34	10 Ω		C48	voir bobines	
S36	10 Ω			véase bobinas	
C47	110 pF		C49	82 pF	48 203 10/82E
C48	110 pF		C50	47000 pF	48 750 10/47K
S40	400 Ω		C51	18 pF	48 201 10/18E
S41	400 Ω		C52	10000 pF	48 751 10/10K
S42	< 1 Ω		C54	30 pF	28 212 36.4
S43	< 1 Ω		C58	39 pF	48 336 99/39E
C1	50 μ F		C59	18 pF	48 201 10/18E
C1a	50 μ F		C61	10000 pF	48 207 50/10K
C2	50 μ F		C62	2200 pF	48 751 10/2K2
C3	11-498 pF		C63	33000 pF	48 750 10/33K
C4	11-498 pF		C64	22000 pF	48 750 10/22K
C5	11-498 pF		C66	3300 pF	48 429 05/3K3
			C67	10000 pF	48 750 10/10K
			C69	22000 pF	48 751 10/22K
			C71	2200 pF	48 758 20/2K2
			C72	1500 pF	48 206 50/1K5
			C73	0.1 μ F	48 757 20/100K
			C76	100 μ F	AC. 5540/100
			C77	0.1 μ F	48 751 10/100K
			C80	330 pF	48 203 10/330E

G81	2700 pF	48 751 10/2K7	R31	0.45 MΩ	48 900 00/DL5CK
C82	680 pF	48 203 10/680E	R32	0.05 MΩ	+450K x)
R1	1000 Ω	49 379 81.0	R33	10 MΩ	A9 999 00/10M.
R2	0.1 MΩ	A9 999 00/100K	R34	0.12 MΩ	A9 999 00/120K
R3	10000 Ω	A9 999 00/10K	R38	47000 Ω	A9 999 00/47K
R4	1000 Ω	A9 999 00/1K	R42	1000 Ω	A9 999 00/1K
R5	0.82 MΩ	A9 999 00/820K	R44	150 Ω	A9 999 00/150E
R6	2x47000Ω par	A9 999 00/47K	R45	820 Ω	49 380 13.0
R7	4700 Ω	A9 999 00/47K	R46	0.05 MΩ	48 900 00/DL5CK
R8	33000 Ω	A9 999 00/33K	R47	0.45 MΩ	+450K x)
R9	10000 Ω	A9 999 00/10K	R49	0.22 MΩ	A9 999 00/220K
R10	330 Ω	A9 999 00/330E	R50	0.47 MΩ	A9 999 00/470K
R11	1 MΩ	A9 999 00/1M	R51	0.15 MΩ	A9 999 00/150K
R12	1.2 MΩ	A9 999 00/1M2	R52	10 MΩ	A9 999 00/10M
R13	47000 Ω	A9 999 00/47K	R53	6.8 MΩ	A9 999 00/6M8
R17	2.2 MΩ	A9 999 00/2M2	R54	47 Ω	B1 636 16.0
R27	220 Ω	A9 999 00/220E	R56	22 Ω	A9 999 00/22E
R28	0.82 MΩ	A9 999 00/820K	x) See list of parts and tools Voir liste des pièces détachées et outils Véase lista de piezas y herramientas.		
R29	0.1 MΩ	A9 999 00/100K			
R30	15000 Ω	A9 999 00/15K			

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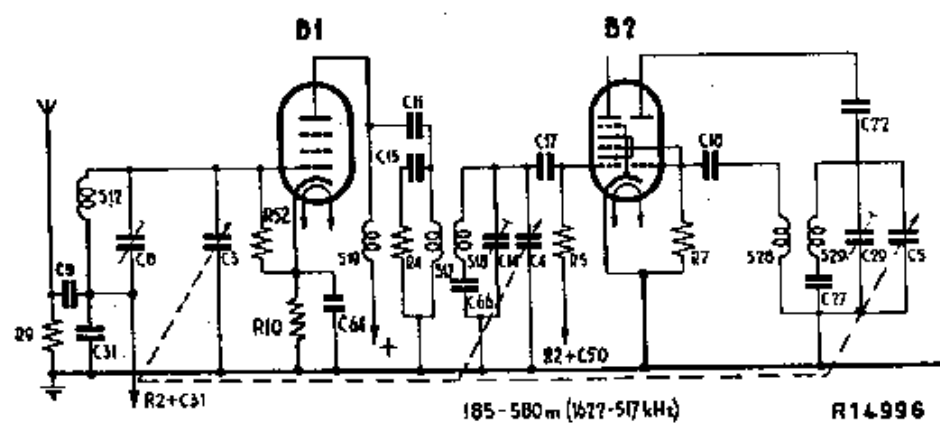
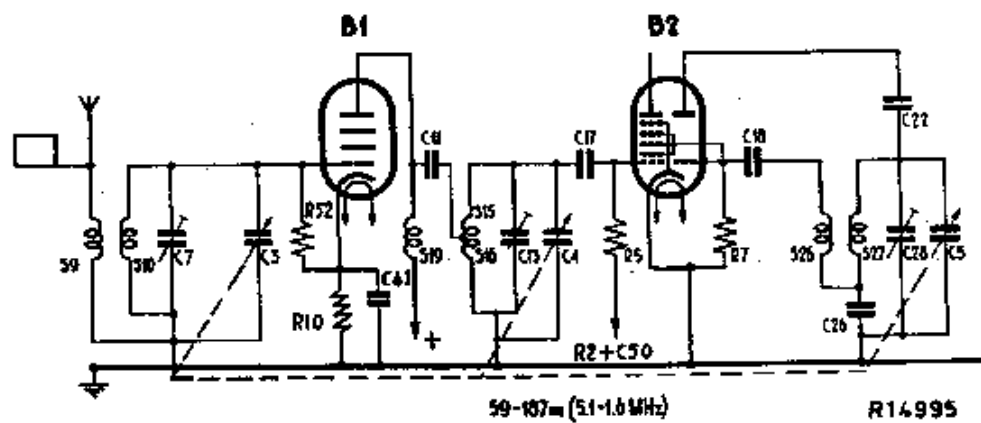
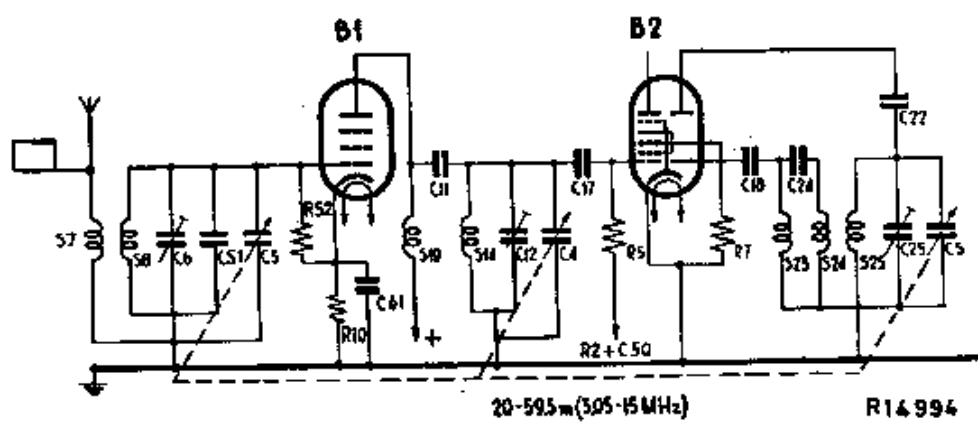
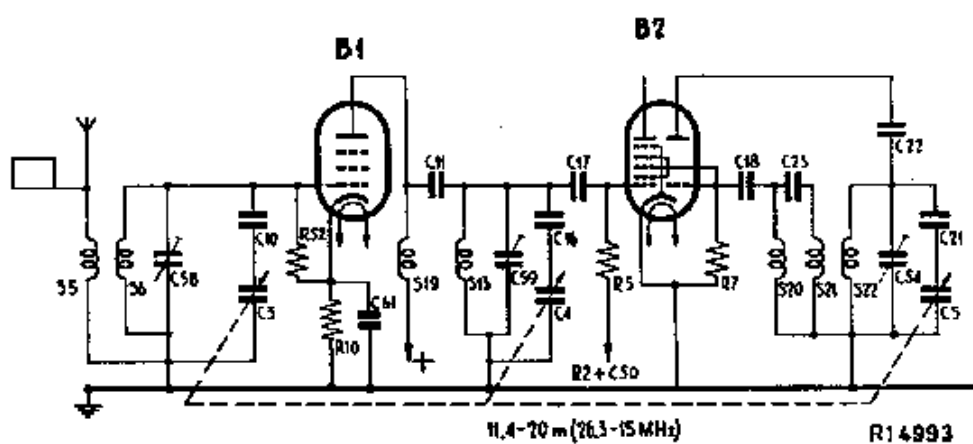
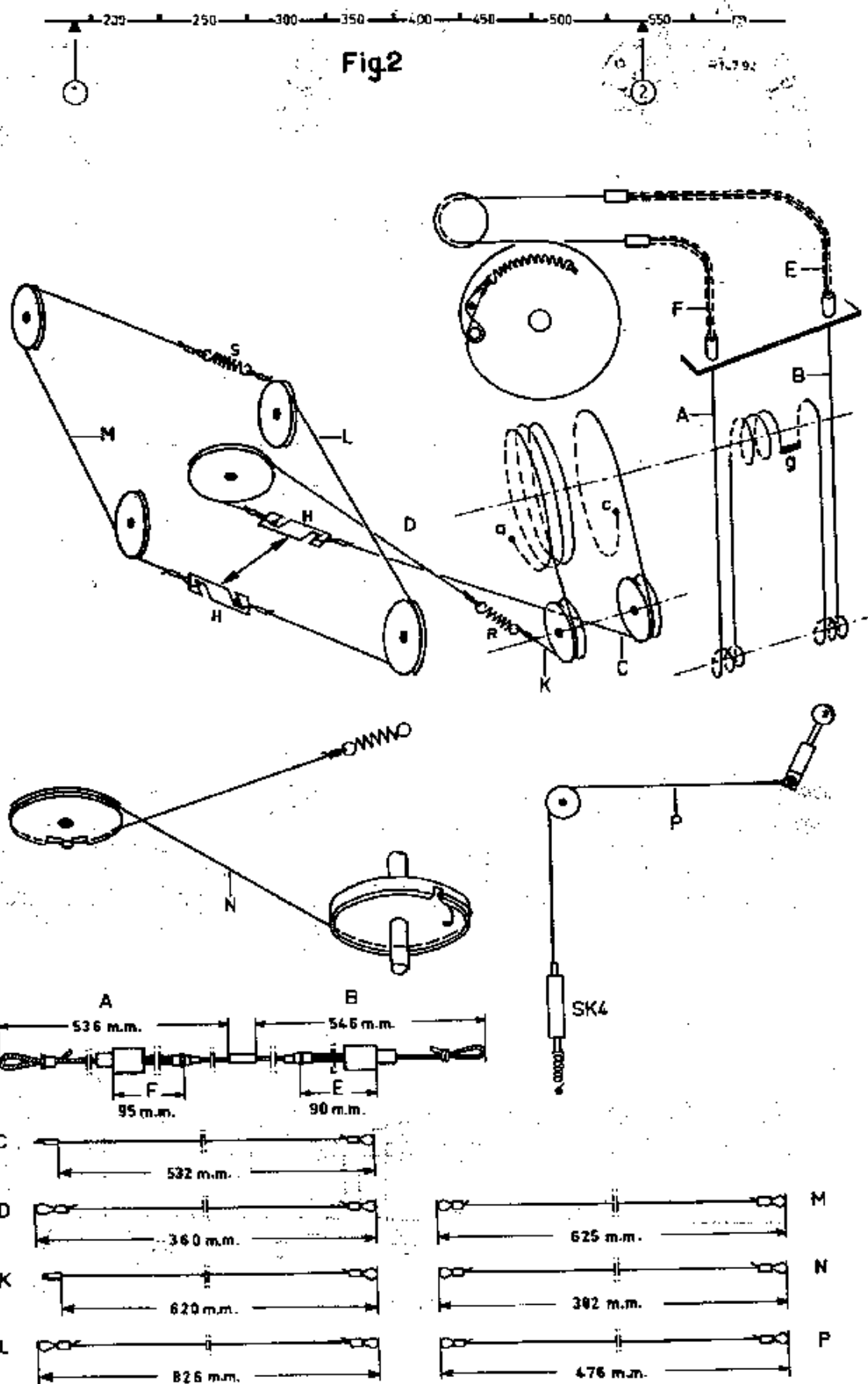
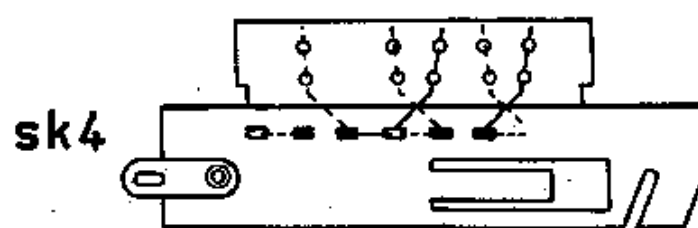
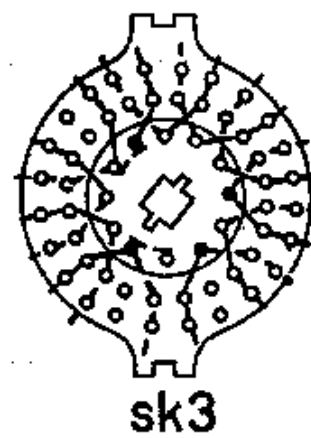
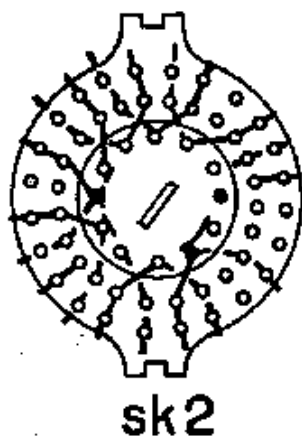
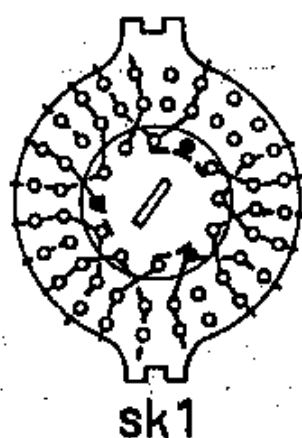
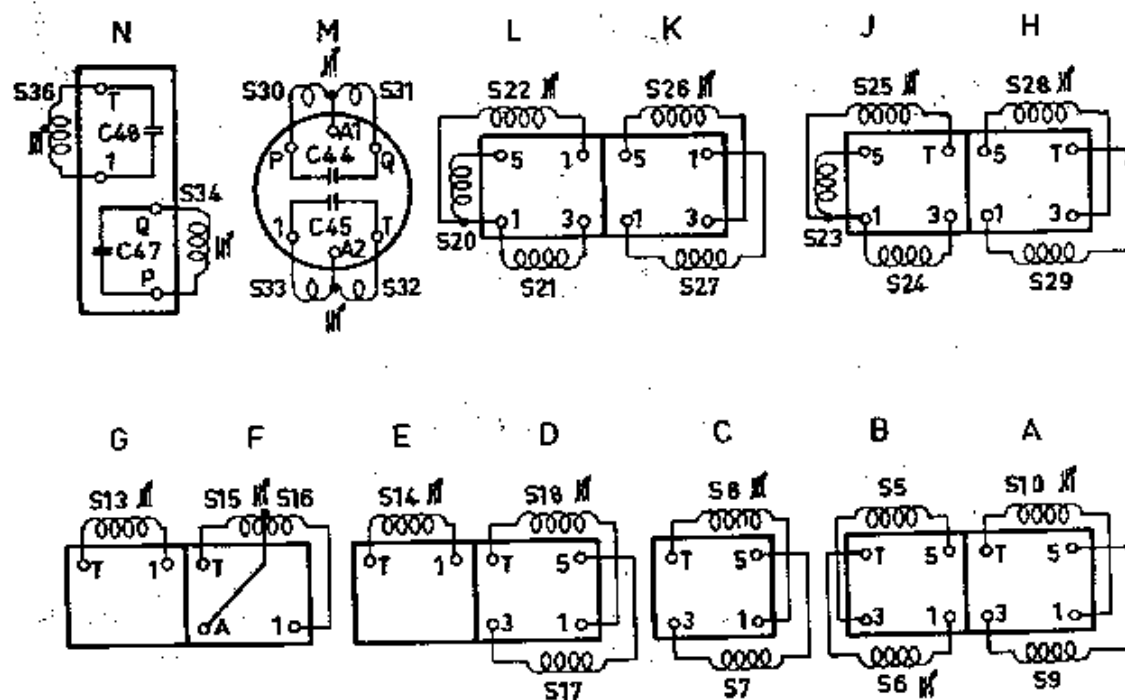


Fig.1





R14990



R14997

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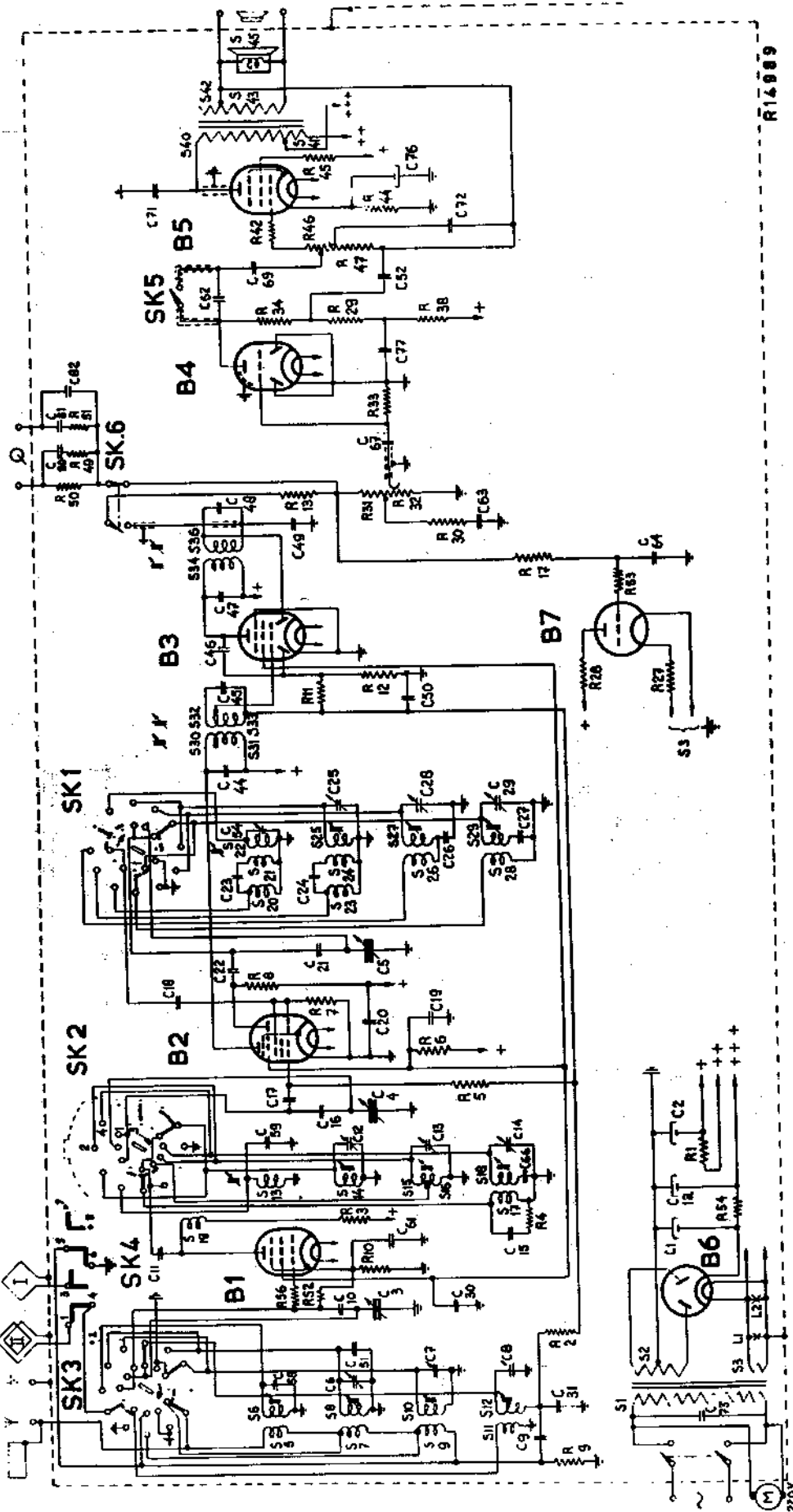
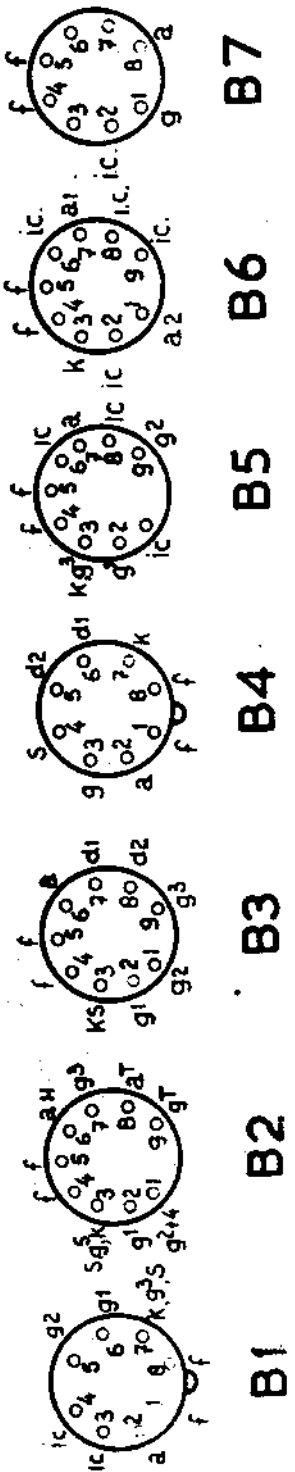


Fig 5



	C. G E B K H F D A										19
S:	69	71	72	73	74	75	76	77	78	79	80
C:	76	77	78	79	80	81	82	83	84	85	86
R:	46	47	48	49	50	51	52	53	54	55	56

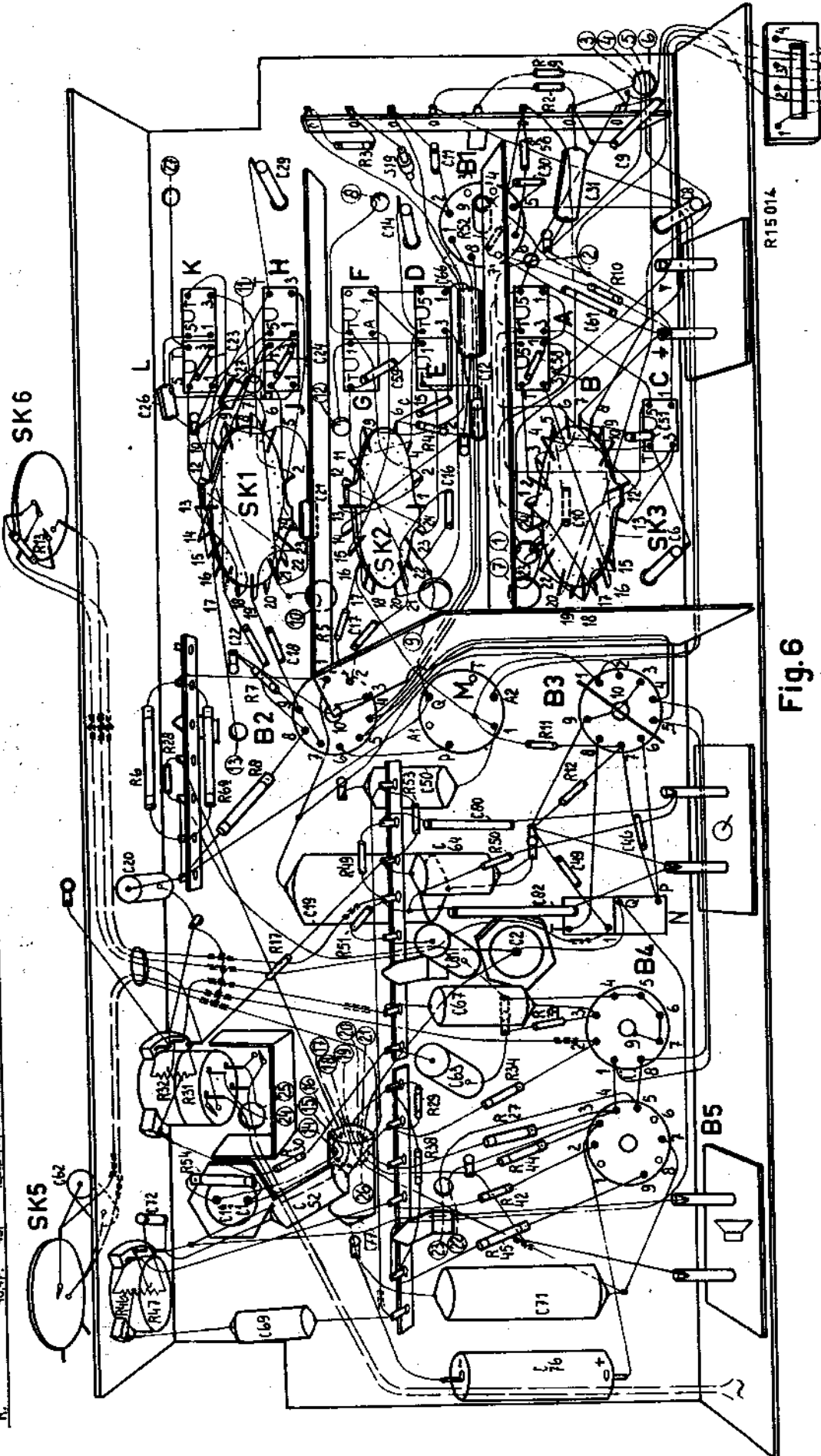


Fig. 6

R15014

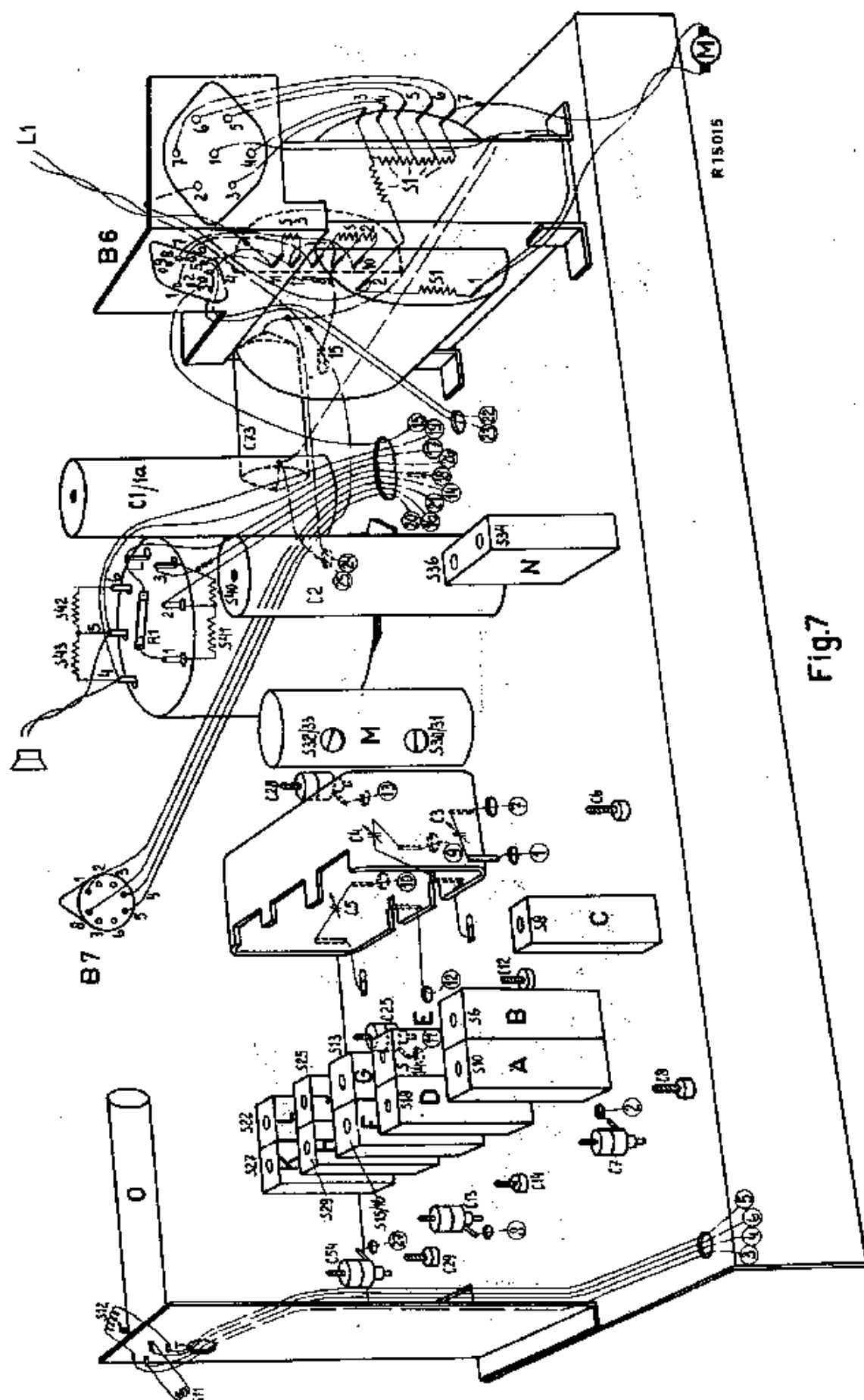


Fig. 7

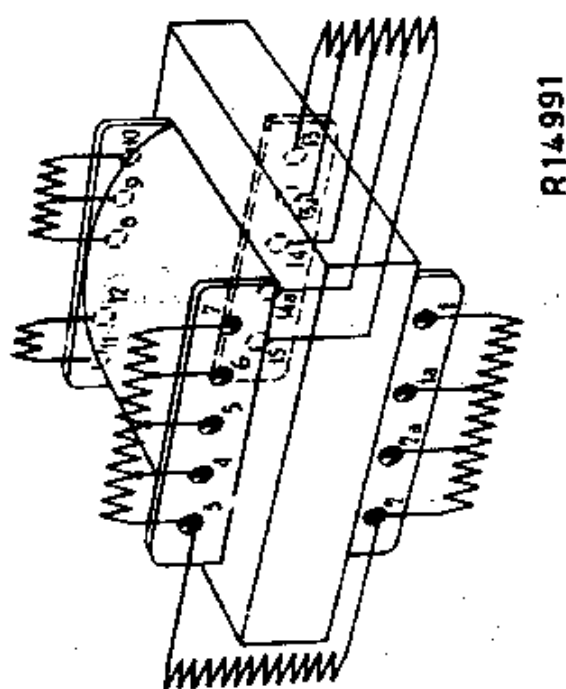


Fig. 8

