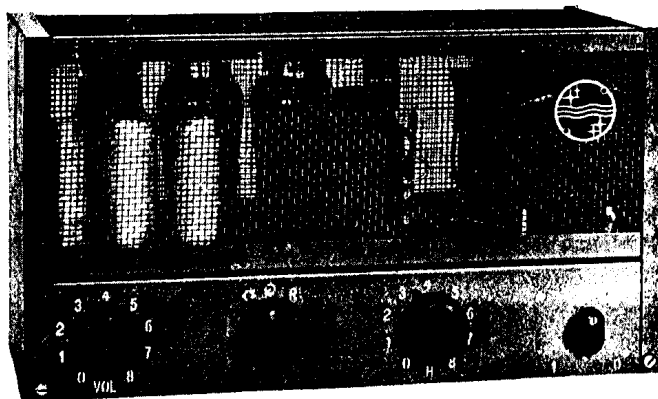


# PHILIPS

SERVICE DATA FOR THE PHILIPS AMPLIFIER  
TYPES 2858 and 2864.



## GENERAL

### TYPES

- 2858/00 - 24 W amplifier with feed transformer for 110, 120, 220 or 230 V.  
2858/01 - 24 W amplifier with feed transformer for 110, 125, 145, 200, 220 or 245 V.  
2864/00 - 10 W amplifier with feed transformer for 110, 120, 220 or 230 V.  
2864/01 - 10 W amplifier with feed transformer for 110, 125, 145 or 230 V.  
and appearance all these ampl.

**DIMENSIONS:** Both types 33x19x20 cm. (13x7,5x7,9 in.)

**WEIGHTS:** Type 2858: 8,2 kg (18 lbs)  
2864: 6,45 kg (14,2 lbs)

### ILLUSTRATIONS

- Fig. 1 Circuit diagram  
Fig. 2 Working scheme EEL  
Figs. 3, 4 and 5 Main transformer connections  
Figs. 6 and 7 Assembly diagrams

### POWER

Type 2858 consumption 97 W, power factor 0.83, output 24 W.  
2864 62 W, " " 0.8, " 10 W.

### CONTROLS AND CONNECTIONS

Controls on front panel, from left to right:

1. Volume control
2. Line, pick-up and radio switch
3. Tone control
4. Mains switch

On back panel, from left to right:

1. Line contacts
2. Loudspeaker plug socket
3. Output voltage adapter
4. Radio socket
5. Pick-up sockets
6. Microphone contacts

### DESCRIPTION (Fig. 1)

The special feature in the circuiting lies in the control of the A/B output stage connected in counter-phase. The phase changing is brought about by the valve EEL instead of the usual intermediate transformer. The EEL is a valve in which use is made of the secondary electron emission.

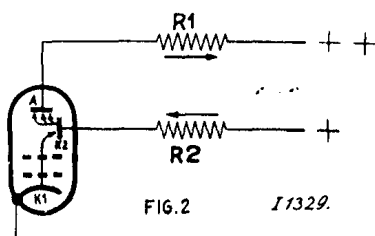


FIG. 2 I1329.

Owing to the bombardement of the secondary cathode (K2) further electrons are released from it and pass over to the anode (A). The quantity of electrons reaching A exceeds that leaving K1. Fig. 2 shows how the currents in R1 and R2 are directionally opposed. The EEL therefore provides for phase changing making it possible to apply a resistance coupling between that valve and the push-pull connected output-stage. Furthermore, with the very steep slope of the EEL no microphone pre-amplification is needed at all. There are no further fundamental changes in the scheme. R2h and C7 do not appear in the 2864 type; otherwise the circuiting of 2864 is exactly the same as that of the 2858 type. For the electrical values of the various components see page 2.

### IMPEDANCES

The impedances of both amplifiers are:  
microphone input 0.35 M.Ωm  
pick-up input 50000 Ωm  
radio input 22 Ωm

for amplifier type 2858:

on microphone (C) 12 mV  
on pick-up (D) 0.3 V  
on radio (R) 730 mV

for amplifier type 2864:

on microphone (C) 5.5 mV  
on pick-up (D) 110 mV  
on radio (R) 730 mV

### OUTPUT DATA

The amplifiers have an output voltage of 100 V. By means of a voltage adapter switch it can be reduced to 60, 35, 20, 12 or 7 volts. The table below gives the total wattage to be fed to speakers (when Philips 100 V loudspeakers are used) and the impedances required!

Type 2858

Output Voltage	Total nom. wattage to speakers			Impedance required		
	W min. appr.	W norm.	W max. appr.	Z max. appr.	Z norm.	Z min. appr.
100 V	18W	24W	30W	220 Ωm	115 Ωm	330 Ωm
60 V	52W	70W	85W	190 Ωm	150 Ωm	120 Ωm
35 V	150W	200W	250W	67 Ωm	50 Ωm	40 Ωm
20 V	450W	600W	750W	22 Ωm	17 Ωm	13 Ωm
12 V	Low ohmic speaker and/or head-phones			8 Ωm	6 Ωm	4,5 Ωm
7 V				2,6 Ωm	2 Ωm	1,6 Ωm

Type 2864

Output voltage	Total nom. wattage to speakers			Impedance required		
	W min. appr.	W norm.	W max. appr.	Z max. appr.	Z norm.	Z min. appr.
100 V	7,5 W	10 W	12,5 W	1340 Ωm	1000 Ωm	800 Ωm
60 V	21 W	28 W	35 W	480 Ωm	360 Ωm	290 Ωm
35 V	60 W	81 W	100 W	168 Ωm	124 Ωm	100 Ωm
20 V	190 W	250 W	310 W	53 Ωm	40 Ωm	32 Ωm
12 V	Low ohmic speakers and/or head phones			19 Ωm	14,4 Ωm	11,5 Ωm
7 V				6,7 Ωm	4,9 Ωm	3,9 Ωm

### Hum and hiss distortion

The following data apply for both types of amplifiers. Both with pick-up and with microphone the max. distortion with an output voltage of 100 V is 10%.

Max. hum : on microphone - 50 dB  
" pick-up - 58 dB  
" radio - 60 dB  
Max. hiss : on microphone - 64 dB  
" pick-up - 67 dB  
" radio - 69 dB

## VALVES

	L1	L2	L3	L4
type 2858	EE1	4699	4699	AX1
2864	EE1	4694	4694	1805

## Safety devices

The mains transformers of both types and both designs are provided with thermal circuit-breakers Z2, code number 28-889-29-1. The output transformers have on the primary side a sparking bridge Z1. The two electrodes of the bridge should be 0.4 mm apart.

## CURRENTS AND VOLTAGES

	EE1 (2858/64)	4699 (2858)	4694 (2864)	AX1 en 1805 (2858/64)
Va (volts)	250	385	390	
Ia (mA)	3.3	4.7	25	
Vg2 (volts)	128	385	393	
Ig2 (mA)	0.2	5	2.7	
Vk2 (volts)	150			
Ik2 (mA)	-2.7			
Vf (volts)	6.3	6.3	6.3	4

## REPAIRS AND REPLACEMENTS

After the bottom plate has been removed all parts are directly accessible and can be replaced if required.  
As to the mains transformer see below.

## Mains transformers connections (figs. 3, 4 and 5)

The primary windings of the mains transformer in the amplifiers of design /00 are connected as shown in fig. 3, whilst the various voltage interconnections are shown in fig. 4.  
Contact 1 passes direct to the mains switch and contact 5 via the thermal circuit-breaker.  
The primary windings of the mains transformer in the amplifiers of the design /01 are connected as shown in fig. 5.

## MECHANICAL PARTS OF BOTH TYPES

Fig.	Item	Description	Code number
6	1	Knob for volume control	23 668 21.1
6	2	Knob for QDR switch and for tone control	23 667 63.1
6	3	Mains switch	28 650 25.2
6	4	Knob for mains switch	23 610 63.2
6	5	Plug socket for speaker contact	28 852 30.0
6	6	Plug for speaker contact	49 291 12.0
6	7	Adapter disc for speaker	21 970 51.0
6	8	Plug plate for same	19 524 54.0
6	9	Contact sockets for radio and same	49 291 10.0
6	10	Plug for same	21 985 05.1
6	11	Three-pole plug contact for microphone	22 555 46.0
6	12	Female plug for same	

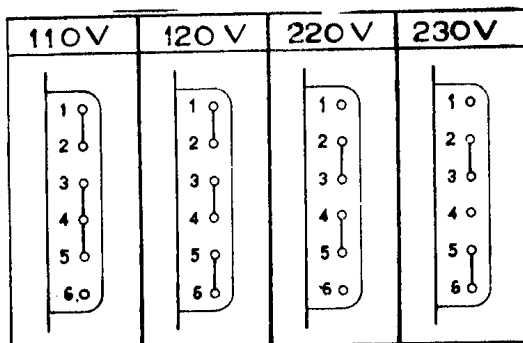
## ELECTRICAL PARTS IN BOTH TYPES

Nr.	Description	Code number
R1	32.000 Ohm	48 424 02/32K
R2	220.000 Ohm	48 424 02/220K
R3	41.000 Ohm	48 424 02/41K
R4	65 Ohm	48 423 02/65K
R5	4.800 Ohm	48 423 02/4.8K
R6	6.800 Ohm	48 423 02/6.8K
R7	50.000 Ohm	48 424 02/50K
R8	89.000 Ohm	48 424 02/89K
R9	0.82 M. Ohm	48 425 10/820K
R10	100 Ohm	48 425 10/100K
R11	47.000 Ohm	48 425 10/47K
R12	10.000 Ohm	48 425 10/10K
R13	22 Ohm	48 426 10/22K
R14	1.000 Ohm	48 425 10/1K
R15	1.000 Ohm	48 425 10/1K
R16	0.56 M. Ohm	48 425 10/560K
R17	0.56 M. Ohm	48 425 10/560K
R18	0.35 M. Ohm	49 470 43.0
R19	1 M. Ohm	49 470 25.1

## ELECTRICAL PARTS IN BOTH TYPES

C1	0.1 mF	48 751 10/100K
C2	47.000 mF	48 751 10/47K
C3	47.000 mF	48 751 10/47K
C4	1.000 mF	48 751 20/1K
C5	32 mF	49 020 41.0
C6	0.47 mF	48 751 10/470K
C7	32 mF	49 020 41.0
C8	16 mF	28 182 56.0
C9		

Fig. 4



11342

## ELECTRICAL PARTS IN TYPE 2858

Nr.	Description	Code number
R12	6.800 Ohm	48 425 10/6.8K
R15	220 Ohm	48 425 10/220K
R20	310 Ohm	48 424 05/310K
R21	1.000 Ohm	48 427 10/1K
R24	310 Ohm	48 424 05/310K
R25	1500 Ohm	48 425 10/1.5K
C7	0.47 mF	48 751 10/470K
C10	16 mF	28 182 56.0
C11	16 mF	28 182 56.0
S1)	mains abt.	27 Ohm
S2)	transf. "	325 Ohm
S3)	design "	1 Ohm
S4)	/01 "	1 Ohm
S5	choke coil "	400 Ohm
S6)	output "	242 Ohm
S7)	transf. "	18 Ohm
		E1 321 50.1
		28 546 08.1
		E1 325 47.0

## ELECTRICAL PARTS IN TYPE 2864

Nr.	Description	Code number
R12	4.700 Ohm	48 425 10/4.7K
R15	150 Ohm	48 425 10/150K
R20	275 Ohm	48 424 05/275K
R21	1.800 Ohm	48 427 10/1.8K
R24	1.500 Ohm	48 425 10/1.5K
C10	16 mF	28 185 73.0
C11	16 mF	28 185 73.0
S1)	mains abt.	27 Ohm
S2)	transf. "	670 Ohm
S3)	design "	1 Ohm
S4)	/01 "	1 Ohm
S5	choke coil "	400 Ohm
S6)	output "	770 Ohm
S7)	transf. "	46 Ohm
		E1 321 51.0 +
		28 546 08.1
		E1 325 48.0

+ When a mains transformer is ordered for amplifiers of the design /00 we supply the transformer of the design /01.  
The green wire which in design /00 amplifiers is soldered to contact 5 (see fig. 4), in design /01 is connected to the soldering contact for the voltage required (see fig. 5).

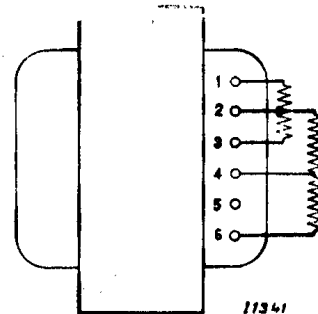


Fig. 3

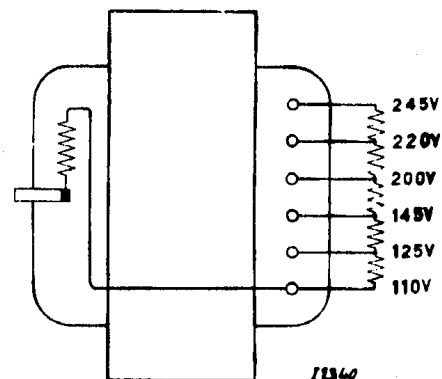


Fig. 5

A 1772

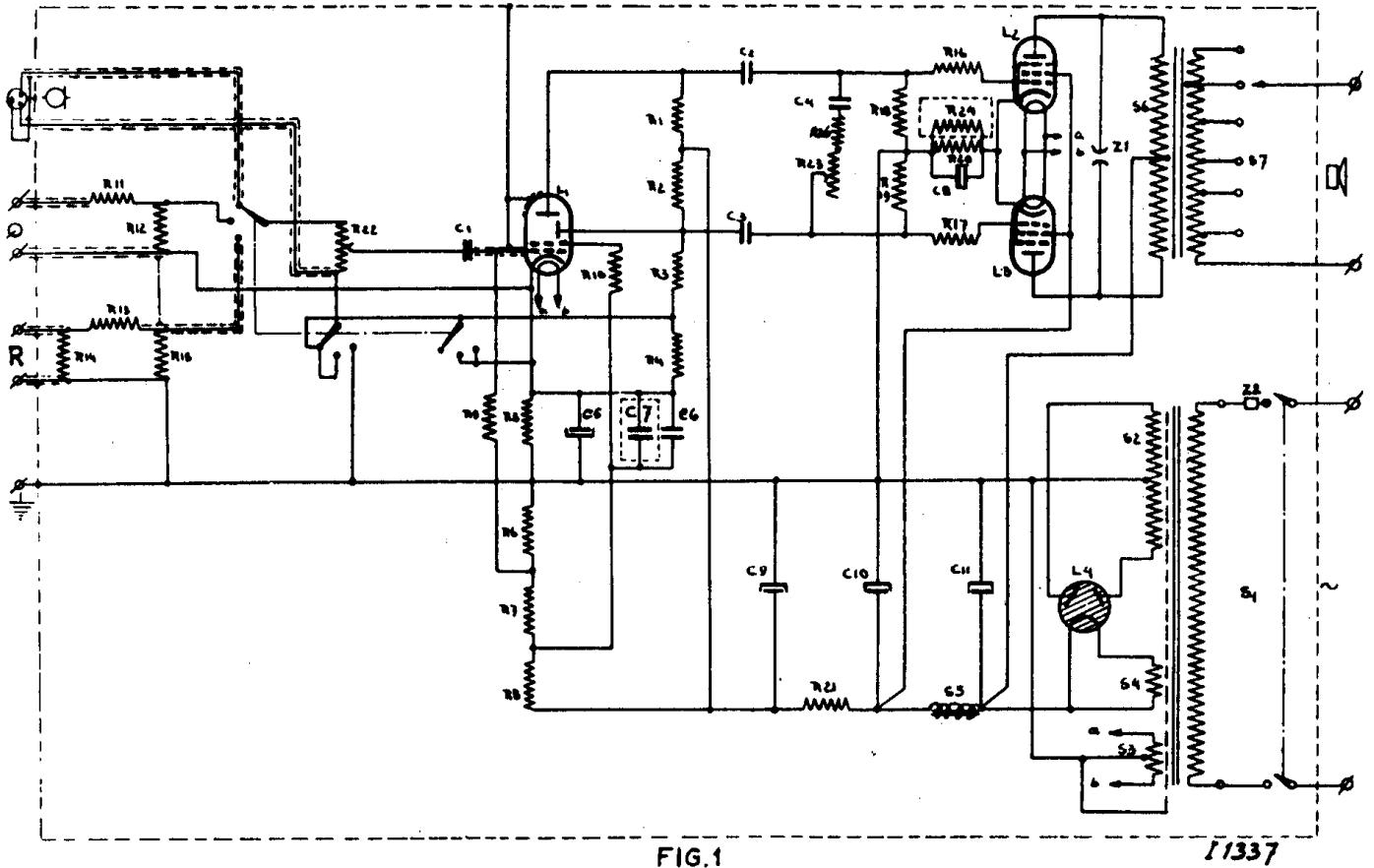


FIG. 1

11337

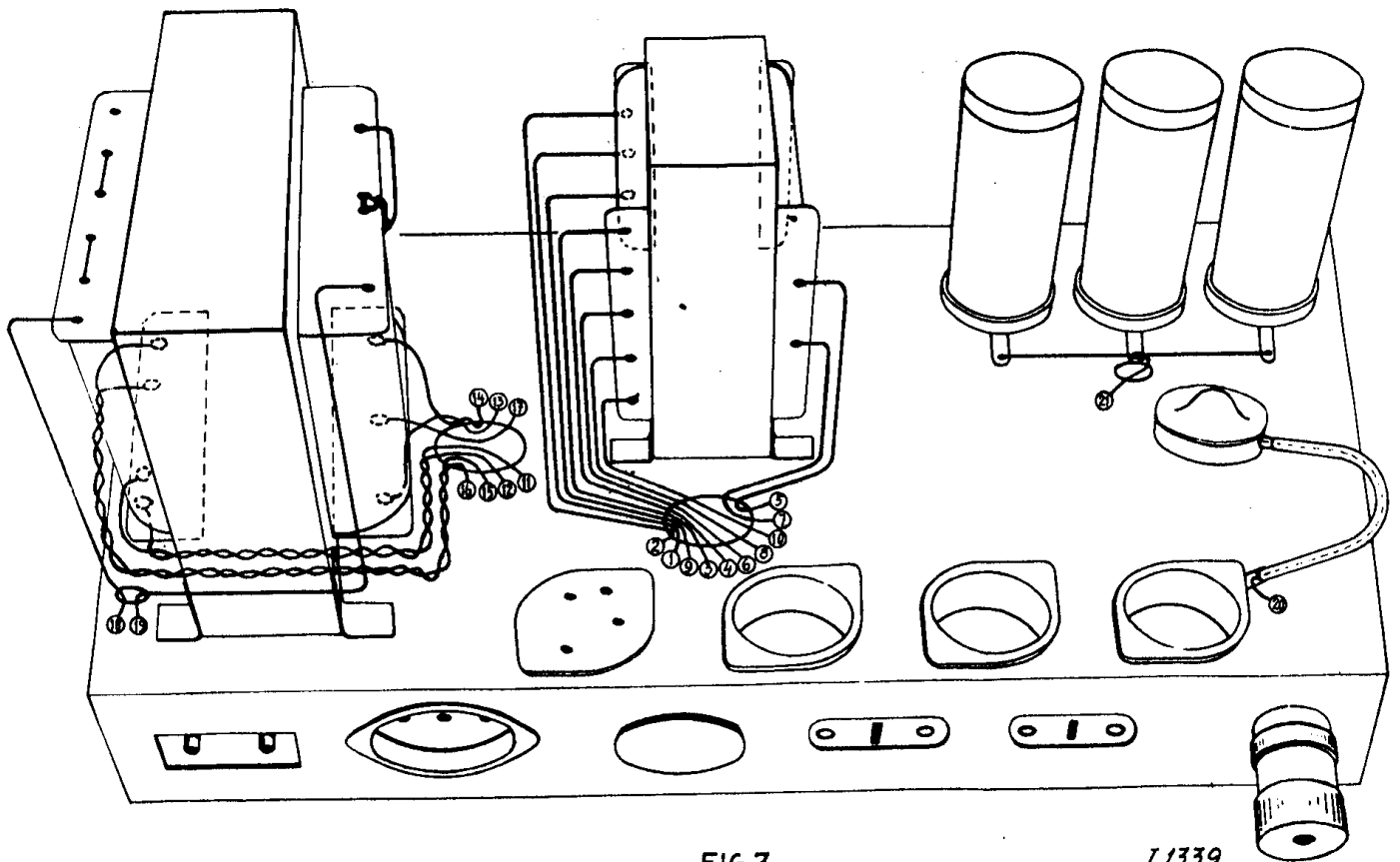
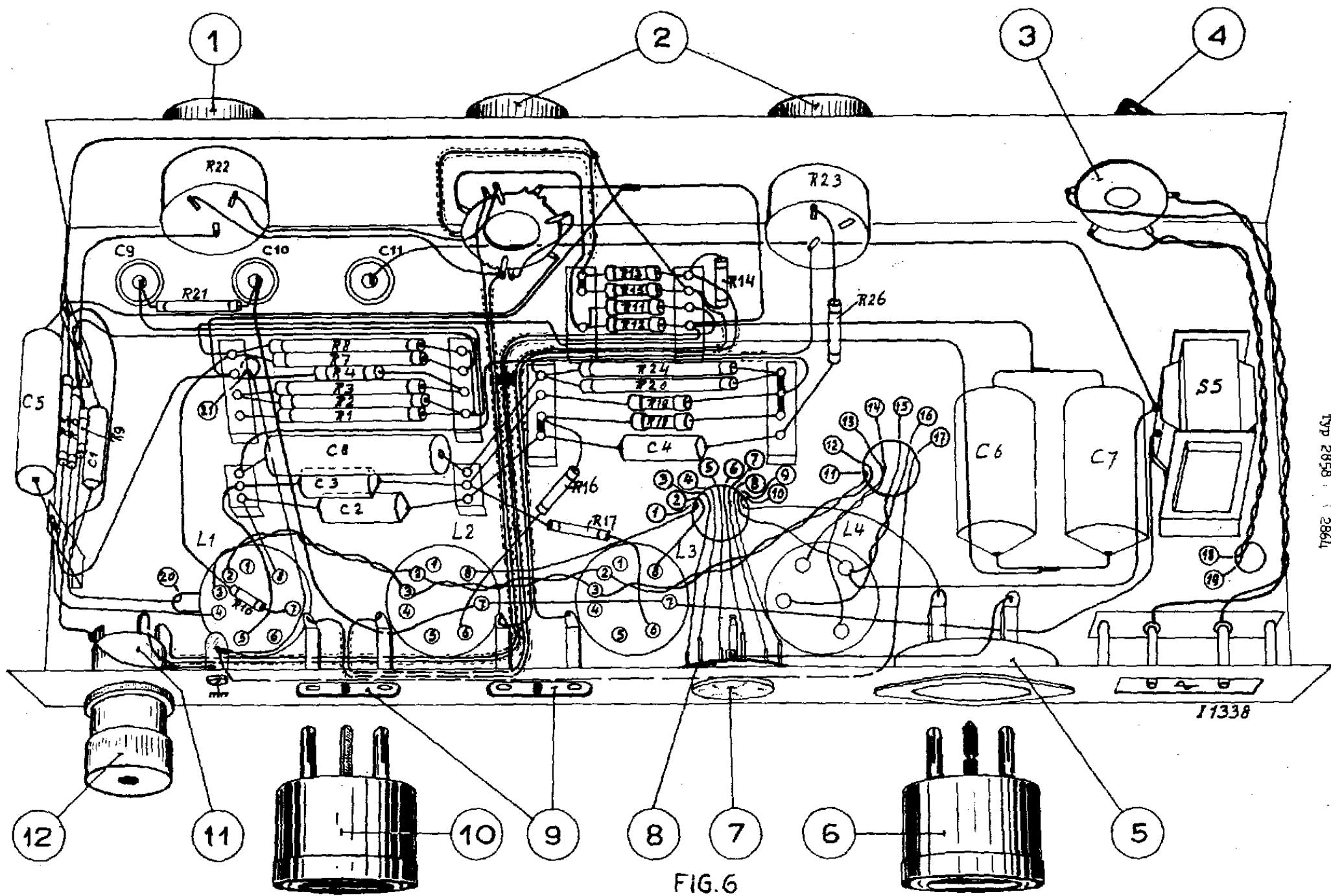


FIG. 7

11339



N.V. PHILIPS EINDHOVEN	HOLLAND	MEETTABEL TABLEAU DE MESURAGE MESSTABELLE MEASURING TABLE	2864	NR: 11344
<b>SERVICE</b>				DAT:

R														
9	M/F	19	26	36										
		270	150	200	200									
10	P/U	U	F	14	15	17	18	15/18						
		140	420	415	425	180	180	175	105					
11	24	27	28	34	37	38	43	44	28/38	43/44				
		290	365	360	290	365	360	320	320	395	390			
12	M/A	L/S	R/W	R	W	T	11	12	12/13	22/23	32/33	41/42		
		365	410	330	330	0	0	0	5	10	10	10	10	

C														
9	27	37	42											
	385	385	415											
10	14/17													
	220													
11	M/19													
		275												
12	15/18													
	360													

Sk 1 pos. 1.  
 Sk 2 pos. 8.  
 Sk 3 pos. 4.  
 Sk 4 pos. 8.

N.V. PHILIPS EINDHOVEN	HOLLAND	MEETTABEL TABLEAU DE MESURAGE MESSTABELLE MEASURING TABLE	2858	NR: 11343
<b>SERVICE</b>				DAT:

R														
9	M/F	19	26	36										
		270	150	200	200									
10	P/U	U	F	14	15	17	18	15/18						
		140	420	415	425	180	180	175	105					
11	24	27	28	34	37	38	43	44	28/38	43/44				
		230	365	250	230	365	250	225	225	265	310			
12	M/A	L/S	R/W	R	W	T	11	12	12/13	22/23	32/33	41/42		
		335	330	340	340	0	0	0	5	10	10	10	10	

C														
9	27	37	42											
	385	385	415											
10	14/17													
	335													
11	M/19													
		275												
12	15/18													
	360													

Sk 1 pos. 1.  
 Sk 2 pos. 8.  
 Sk 3 pos. 4.  
 Sk 4 pos. 8.

N.V. PHILIPS'  
GLOEILAMPENFABRIEKEN  
EINDHOVEN

Betreft: netschakelaar  
2858-2864

UITLEEND  
N.V. Philips' Verkoop-Maatschappij  
Voor Nederland.  
Technische Dienst  
4.4.50

SERVICE

In de laatst afgeleverde serie van de versterkers 2858-2864 is de netschakelaar, codenummer 28 650 25.2 met platte knop codenummer 23 610 63.0 vervangen door schakelaar codenummer 08 522 70.0 met ronde knop codenummer 23 667 63.1.

Re: Mains switch 2858-2864

In the last delivered series of the amplifiers 2858-2864 the mains switch code number 28 650 25.2 with flat knob code number 23 610 63.0 has been altered into switch code number 08 522 70.0 with sound knob code number 23 667 63.1.

Betr.: Netzschalter 2858-2864

In den letzt gelieferten Serien Verstärkern 2858-2864 ist der Netzschalter Kodenummer 28 650 25.2 mit plattem Knopf Kodenummer 23 610 63.0 ersetzt worden von dem Schalter Kodenummer 08 522 70.0 mit rundem Knopf Kodenummer 23 667 63.1.

Conc.: Interrupteur réseau 2858-2864

Dans les séries d'amplificateurs 2858 et 2864 livrées le plus récemment l'interrupteur de réseau no. de code 28 650 25.2 avec bouton plat no. de code 23 610 63.0 a été remplacé par l'interrupteur de réseau no. de code 08 522 70.0 avec bouton rond no. de code 23 667 63.1.

Conc. Interruptor de red 2858-2864

En las series de los amplificadores 2858-2864, ultimamente entregadas se ha reemplazado el conmutador de red 28 650 25.2, con botón plano, 23 610 63.0 por el conmutador 08 522 70.0 con botón redondo 23 667 63.1.

Service afdeling,

  
A.L. Timmer

WK/vWi-S