

Chapter 89

DIMMER SWITCH, B.T.H., TYPE X2251569

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LEADING PARTICULARS

Dimmer switch, B.T.H., Type X2251569 ...	<i>Ref. No.</i> 5CW/5992
<i>Voltage</i>	115 V., 3 phase, 400 c./s.
<i>Overall dimensions (in.)</i>	$7\frac{5}{8} \times 4 \times 2\frac{1}{8}$

Introduction

1. The dimmer switch, Type X2251569, is a three-gang, 28-step switch. It is used to control ultra-violet lighting in aircraft.

DESCRIPTION

2. A sectional view of the dimmer switch is given in fig. 1. It consists of four banks operated from a common shaft, to the end

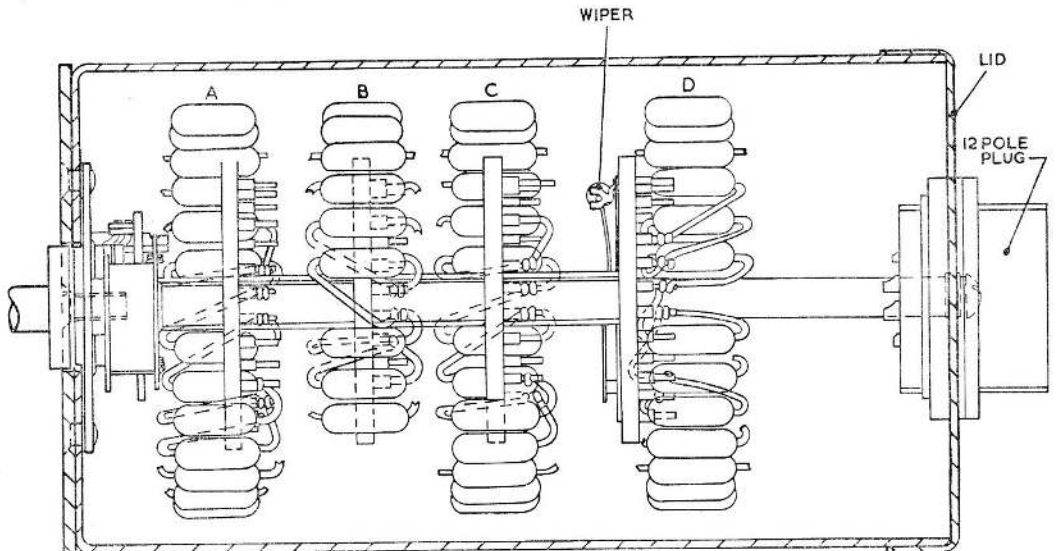
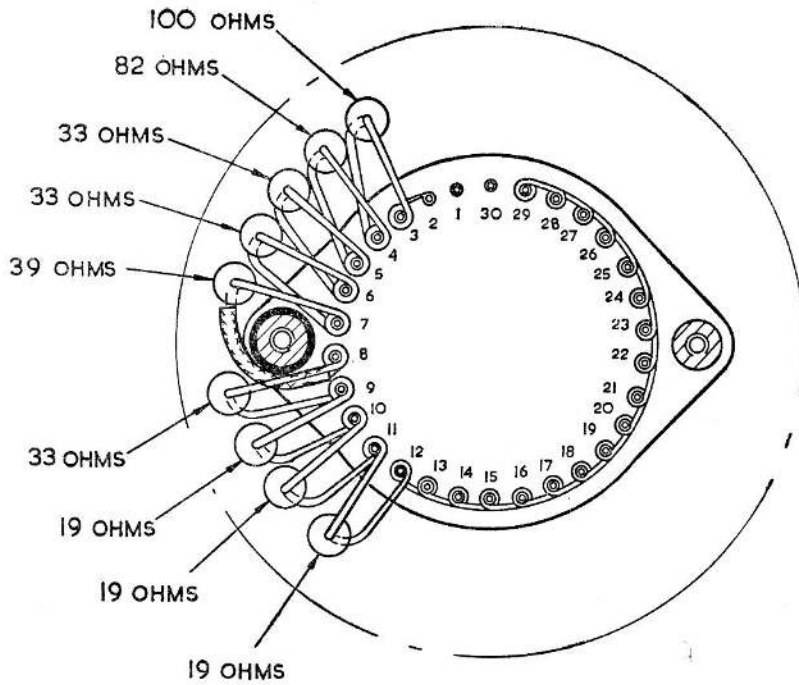
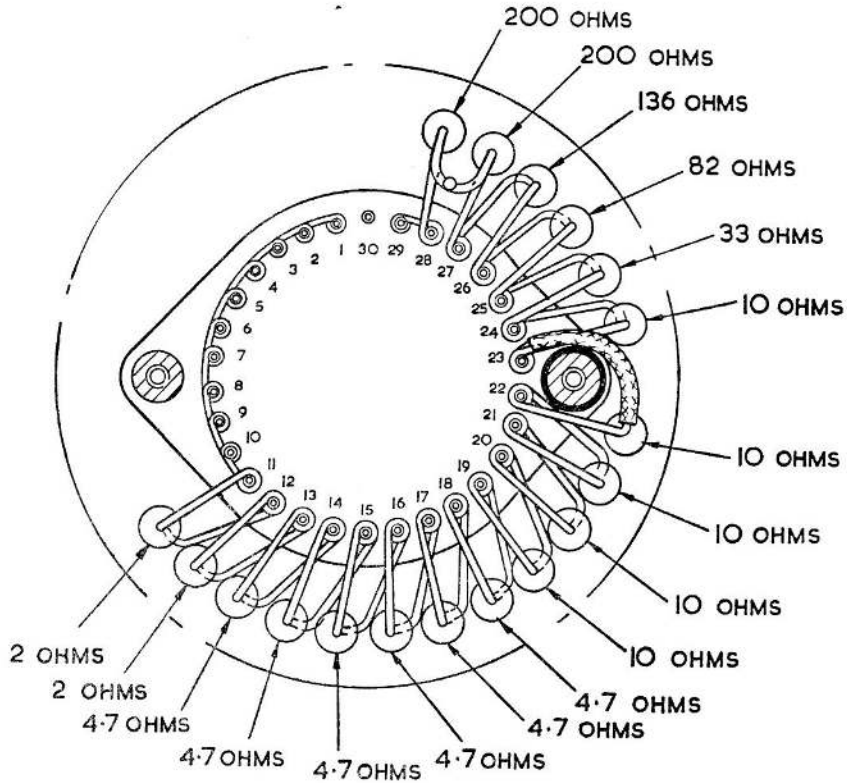


Fig. 1. Sectional view of dimmer switch

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RESISTOR BANK B VIEWED FROM PLUG END.



RESISTOR BANKS A, C AND D VIEWED FROM PLUG END.

Fig. 2. Connection of resistors to studs

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of which is screwed a round knob. Each bank has 30 contact studs moulded into a panel, only 29 of which are used. As the knob is rotated to select the various positions, a wiper makes contact between the appropriate stud and the collector ring.

3. Resistors are connected between adjacent studs as shown in fig. 2. Therefore, rotation of the knob varies the resistance between the collector ring and stud 1.

4. The internal wiring of the switch is brought out to a 12-pole plug (Ref. No. Z560150) on the end of the switch. A circuit diagram is given in fig. 3.

5. Two fixing holes, each $\frac{7}{32}$ in. dia., are provided to secure the switch to the mounting panel.

OPERATION

6. Three ultra-violet lamps can be controlled by this dimmer switch. It is used in a circuit where the lamps have high resistances in parallel with them in the bright condition and are dimmed by reducing this resistance. This is the function of the parallel resistor banks A, C and D. When resistor banks A, C and D are reduced to zero resistance, the lamps are short circuited and the cathodes at each end of the lamps are left glowing. Further dimming is achieved by connecting resistance in series with the cathodes. This is the function of resistor bank B which also serves as an on/off switch in that it is open circuited when

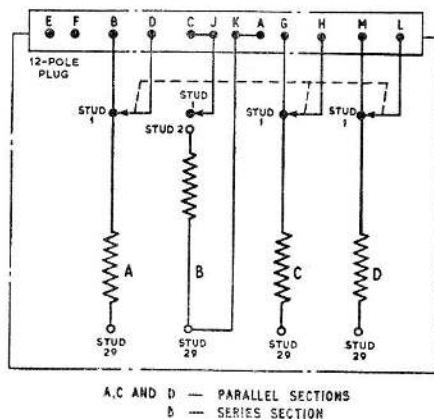


Fig. 3. Circuit diagram

connected to stud 1. The one series resistor bank serves all three lamps, it being in series with the supply to the three lamp circuits.

SERVICING

7. The switch should be given a visual examination for freedom from damage and security of connections.

8. The resistor assembly can be checked using a multi-range test set connected across various pins of the 12-pole plug as indicated in Table 1.

Table 1
Resistor test

Stud No.	Resistance (ohms)	
	Pins B-D, G-H, L-M	Pins A-C, J-K
1	0	O.C.
2	0	377
3	0	377
4	0	277
5	0	195
6	0	162
7	0	129
8	0	90
9	0	57
10	0	38
11	0	19
12	2	0
13	4	0
14	8.7	0
15	13.4	0
16	18.1	0
17	22.8	0
18	27.5	0
19	32.2	0
20	42.2	0
21	52.2	0
22	62.2	0
23	72.2	0
24	82.2	0
25	115.2	0
26	197.2	0
27	333.2	0
28	733.2	0
29	733.2	0

9. Using a 500-volt insulation resistance tester, measure the insulation resistance between all the pins of the 12-pole plug used connected together and the frame of the switch. A reading of not less than 10 megohms should be obtained.

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