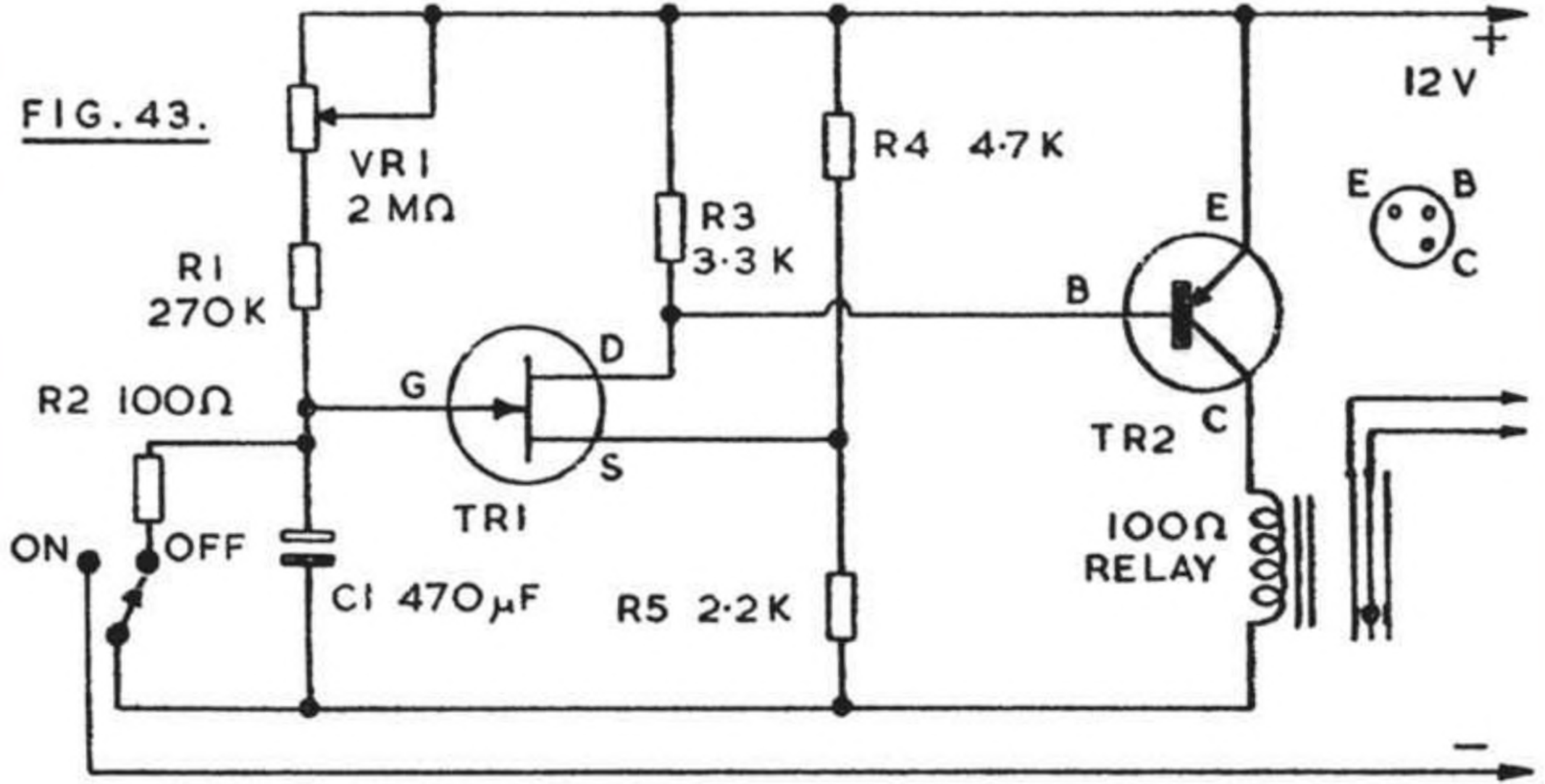
Timer

An adjustable timer, giving a delay of about 10 seconds to 1 minute, can be used for photographic and other purposes; or with various games where each competitor must make his move within the agreed period.

The circuit in Figure 43 can be employed in various ways, as will be explained. When the switch is moved to the "On" position timing begins, and C1 commences to charge through R1 and

FIG. 43.


+
12 V
VR1
2 MΩ
R1
270K
R2 100Ω
R3
3·3 K
R4 4·7 K
D
G
S
TR1
E
B
C
TR2
E
B
C
100Ω
RELAY
ON
OFF
C1 470μF
R5 2·2K
–

VR1. The two resistors R4 and R5 hold the source of TR1 at approximately a fixed potential. When the voltage cross C1 has reached a high enough level TR1 gate is positive, so that drain current flows through P2. This causes a voltage drop in R3, so that the base of TR2 moves negative. TR2 is a PNP transistor, so conducts, and collector current flows in the relay coil, closing the relay contacts.

When the switch is returned to the "Off" position, C1 is discharged through R2, so that the interval can be repeated.

A 2N3819 is suggested for TR1, and AC 128 for TR2. With C1 as shown (470uF) the interval was found to lie between 10 seconds with a total of 250k in the R1/VR1 position, up to 1 minute with 2 megohm. So the values in Figure 43 can be expected to allow any interval to be set from approximately 10 seconds to 60 seconds. Increasing C1, R1 or VR1 will lengthen the interval. Smaller values here will reduce it. This was with current rising to 40mA, with a 100 ohm relay.

It is not of course essential that these values or transistor types be followed exactly, and other relays would also be practicable, provided the circuit and TR2 allows a satisfactory current and~ voltage to suit the winding. Generally, a relay with a coil resistance of about 100 to 250 ohms will be most satisfactory.

The relay contacts can be so wired, that when the relay coil is energised, the circuit is completed, or interrupted. The former will most usually be wanted. Closure of the contacts can then light an indicator lamp, or sound a buzzer or bell. The use of opening contacts will be convenient for repeating a set interval when enlarging. A 2-pole 2-way switch is then required, so that switching the timer on lights the lamp to begin the exposure, which continues until the relay contacts open.

For games and similar purposes, a 12 volt 3 watt indicator lamp can be operated from the same 12v supply. Should any kind of mains voltage circuit be controlled, the relay must be a

type intended for this purpose, and care must be taken to arrange mains circuit so that no danger can arise for the user.