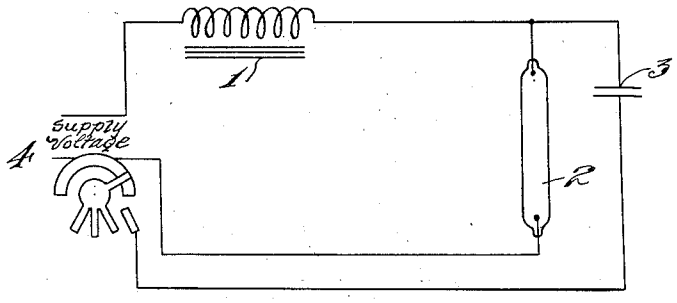
June 8, 1937. L. F. BIRD 2,082,939

STARTING CIRCUIT FOR VAPOR ELECTRIC DEVICES

Filed May 23, 1936 2 Sheets-Sheet 1

Fig. 1



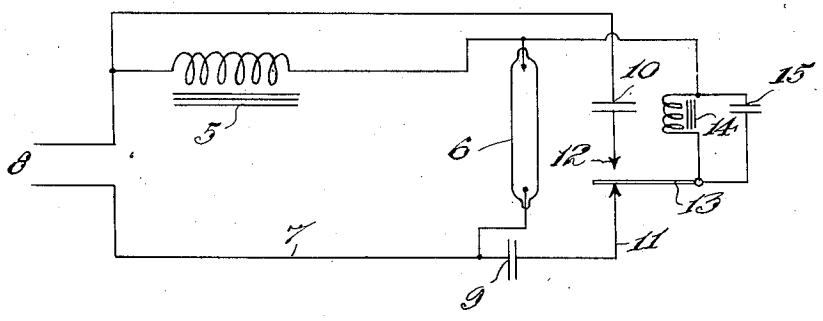


Fig. 2

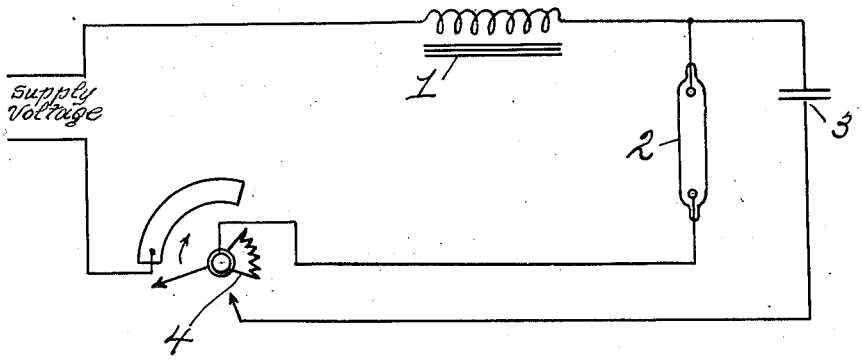
INVENTOR
Lester F. Bird.
BY
Fredk C. Fischer.
ATTORNEY

June 8, 1937. L. F. BIRD 2,082,939

STARTING CIRCUIT FOR VAPOR ELECTRIC DEVICES

Filed May 23, 1936 2 Sheets-Sheet 2

Fig. 3.



INVENTOR
Leslie F. Bird.
BY
Frank A. Fischer.
ATTORNEY

Patented June 8, 1937 2,082,939

UNITED STATES PATENT OFFICE

2,082,939

STARTING CIRCUIT FOR VAPOR ELECTRIC DEVICES

Lester F. Bird, Newark, N. J., assignor to Hanovia Chemical and Manufacturing Company, Newark, N. J., a corporation of New Jersey

Application May 23, 1936, Serial No. 81,412

6 Claims. (Cl. 176—124)

This invention relates to starting means for gas or vapor filled discharge tubes operating on low voltages, such as the common supply voltages furnished for home use. The difficulties in starting this type of tube are well known and are due to static charges which collect on the walls of such tubes and prevent the static fields produced by application of potential to the electrodes from being effective at the opposite ends of the tube, thus preventing a discharge. If the potential at the electrodes is increased sufficiently these static charges are overcome and a discharge is started. For low voltage tubes some kind of a starting device is essential.

It is an object of my invention to provide a new and greatly improved starting device for these lamps that is positive in operation and simple to operate. In fact the user of the device may be entirely unaware that it is incorporated in the lamp at all, since it may be made a part of the starting switch and the act that turns the power on the lamp also operates the starting device automatically.

A further object of the invention is the provision of means for automatically shocking the discharge tube with a surge of relatively high frequency electricity at elevated voltages after the power is applied to the tube. The method of securing the surge is unique and will be hereinafter described in detail with reference to the attached drawing.

These and other advantageous objects, which will later appear, are accomplished by the simple and practical construction and arrangement of parts hereinafter described and exhibited in the accompanying drawing, forming part hereof, and in which:

Fig. 1 is a wire diagram of a circuit manually storing gas or vapor filled discharge tubes in accordance with my invention, and

Fig. 2 is a wire diagram of a circuit for automatically storing gas or vapor filled discharge tubes in accordance with my invention.

Fig. 3 is a diagram of a circuit similar to that shown in Fig. 1, having an operating switch which has incorporated therein a contact device for connecting and disconnecting a capacitor after current has been applied to the tube circuit.

Referring to the drawings, in Fig. 1 there is shown the circuit of a discharge tube having a stabilizing reactance 1, a discharge tube 2, a capacitor 3 and an intermittent contact 4. The contact 4 can be constructed in a number of ways; but I have found it highly satisfactory and simple to incorporate it as a part of the operating switch so that after the circuit is closed and power is applied to the discharge tube, the intermittent contact functions for several operations and then stops. When contact is made at 4, the capacitor 3 is connected across the discharge tube, and draws a small current from the supply voltage through the stabilizing reactance 1. When the contact 4 is broken again, this current is interrupted which causes a potential across the reactance, which is impressed across the discharge tube, and always at a time when there is potential across the electrode. This potential is of relatively high voltage and frequency and is of sufficient magnitude to ignite the discharge in the tube.

I have made a number of different arrangements of the contact 4, some of which are purely mechanical, and some are combined mechanical and electrical. The simplest one is a rotating segment attached to the central post of a rotating type of snap switch such that a series of contacts results as the switch is operated in the usual manner. I have also made several forms in which the operation of the contacts is produced by electrical magnets and mechanical contacts. Both types have proved entirely satisfactory.

In Fig. 2 is shown a modified form of the invention in which the intermittent contact is produced by a form of electrical buzzer. In this form of the invention a stabilizing reactance 5 is connected in series with the discharge tube 6. The tube 6 is connected to a condenser 9, and to a contact 11 which is adapted to engage the armature 13 of an electrical magnet 14 which is in parallel with a condenser 15. The coil of the electrical magnet is connected to the reactance 5. The reactance 5 is also connected through a condenser 10 to a contact 12, which is also adapted to engage the armature 13 when the electrical magnet 14 is energized.

In operation, the power for the electric magnet is secured from two sources, since it is essential that the contact mechanism lie idle when the discharge tube is burning. As soon as the power is applied current can flow from the supply at 8, through the reactance 5, through the coil of the electric magnet 14 to the vibrating arm 13, through the contact 11 and a capacitor 9, and then through the conductor 7 back to the other side of the supply. Current through this path energizes the electric magnet to raise the armature 13, to break contact at 11, and make contact at 12. However, this motion interrupts the current through the electrical magnet, so that the armature 13 immediately falls back into engage-

ment with contact 11. This operation continues until the discharge tube is ignited. Immediately upon the ignition of the tube, a potential drop appears across the reactance 5. This potential is impressed through the capacitor 10 to the contact 12. The next time the armature 13 moves into contact with 12, a current flows through the coil of the electrical magnet and the armature is retained against 12 so that the interruptions cease; and the interruptions are not restored until the burner is extinguished or the power is turned off.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive or limitative of the invention, of which obviously an embodiment may be constructed including many modifications without departing from the general scope herein indicated and denoted in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An electrical circuit including a vapor filled electric discharge tube, a stabilizing impedance in series with said tube, a capacitor capable of withstanding the applied potential across the discharge tube, and an intermittent contact device which makes several contacts after the application of power through the circuit of the discharge tube for connecting and disconnecting the capacitor across the discharge device.

2. An electrical circuit involving a gaseous or vapor filled discharge tube with its associated stabilizing impedance, a capacitor capable of withstanding the impressed potential across the discharge tube, and a contact device which intermittently connects and disconnects the capacitor across the discharge tube, said contact making device being incorporated as an integral part of the power control switch and operating in conjunction with the movements of the switch.

3. In an electrical circuit, a vapor-filled discharge tube in series with a control impedance, an electromagnet having one terminal of the solenoid thereof connected to the junction of said tube and impedance, said electromagnet having an armature in series with the solenoid thereof, a first capacitor arranged to be connected in parallel with the tube by the armature when the solenoid is de-energized, and a second capacitor arranged to be connected in parallel with said impedance when the solenoid is energized.

4. In an electrical circuit, a vapor-filled discharge tube in series with a control impedance, a capacitor capable of withstanding the impressed potential across the discharge tube, a contacting device for connecting and disconnecting the capacitor across the discharge tube for several operations after power is applied to the discharge tube, said contacting device comprising an electromagnet having a solenoid and armature connected in series and one terminal of the solenoid connected to the junction of the tube and impedance, said armature connecting the capacitor so that the magnet receives operating current from across the discharge tube until a discharge is initiated, and said armature being arranged to connect the electromagnet in parallel with said impedance after the initiation of the discharge so that the magnet receives power from the potential across the impedance for stabilization of the arc.

5. An electrical circuit comprising a vapor filled discharge tube, an associated impedance operating in conjunction therewith, a power control switch for connecting the discharge tube circuit to a source of power, a capacitor capable of withstanding the potential across the discharge tube, and a contact making device incorporated within the mechanism of the power control switch which automatically connects and disconnects the capacitor across the terminals of the discharge tube after electric power has been applied to the tube circuit.

6. An electrical circuit comprising a gaseous or vapor arc device, a source of electric power, a stabilizing impedance, a capacitor capable of withstanding the applied potential across the arc device, and a contact making device incorporated within the power control switch so that normal operation of the power control switch also operates to connect and to disconnect the capacitor across the arc device after power has been applied to the circuit.

LESTER F. BIRD.