

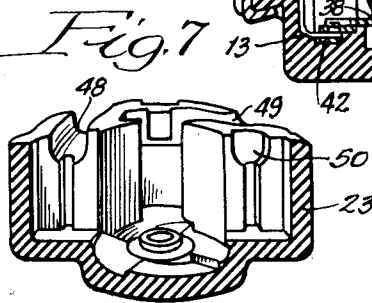
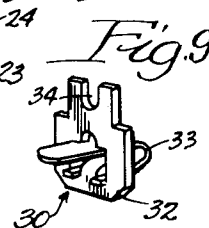
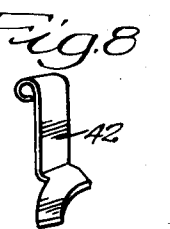
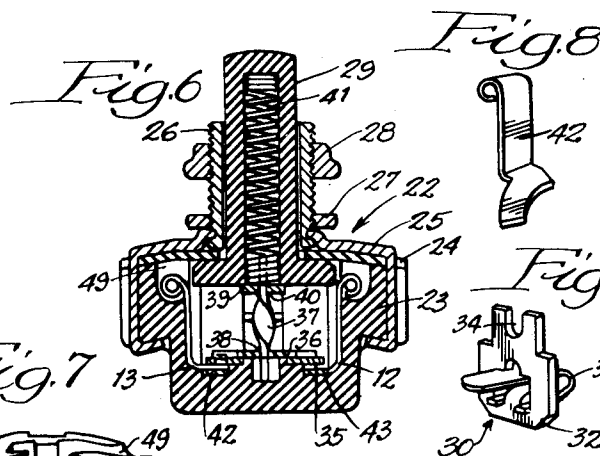
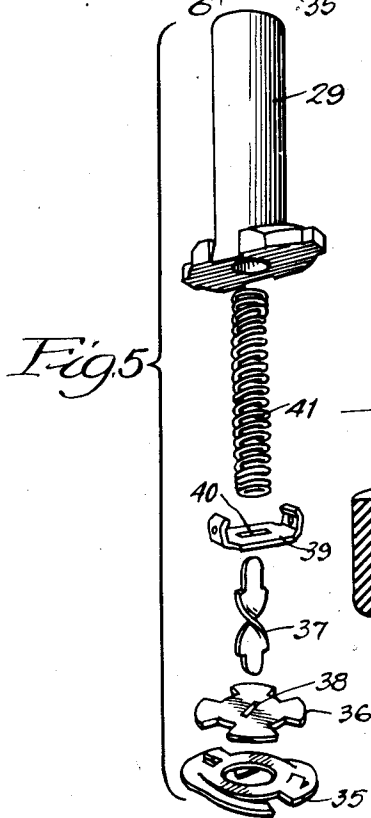
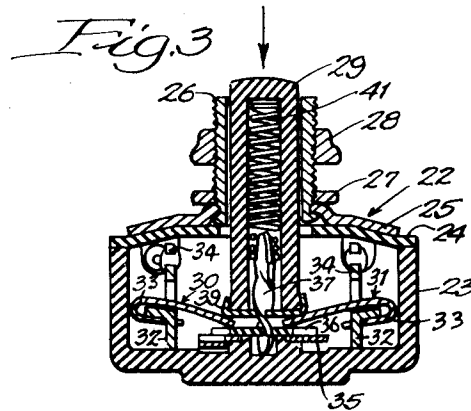
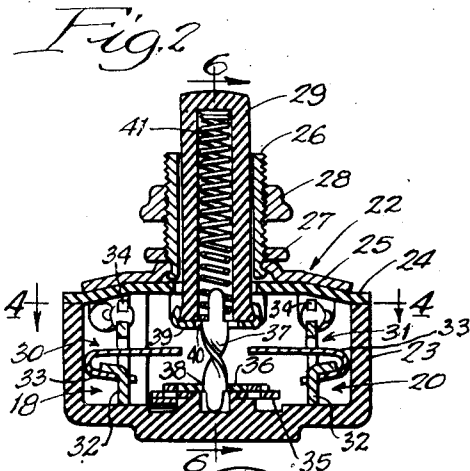
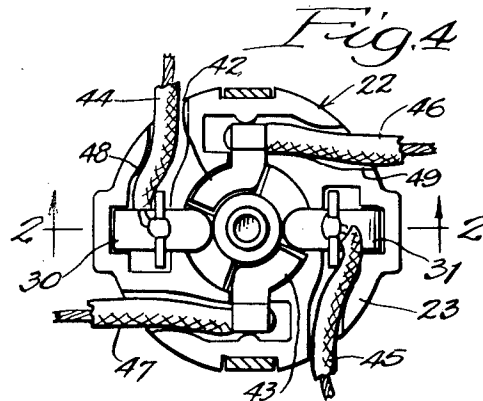
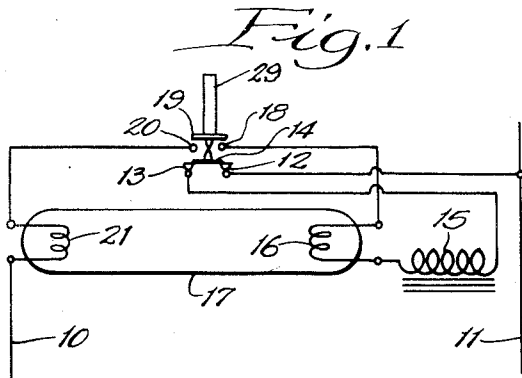
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B. K. NASTER

2,331,040

SWITCH FOR CONTROLLING OPERATION OF GASEOUS DISCHARGE LAMPS

Filed Jan. 27, 1941



Inventor:
Bert K. Naster
By Dawson, Ooms & Booth
Attorneys.

UNITED STATES PATENT OFFICE

2,331,040

SWITCH FOR CONTROLLING OPERATION OF
GASEOUS DISCHARGE LAMPS

Bert K. Naster, Chicago, Ill.

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2 Claims. (Cl. 200—6)

This invention relates to a switch and more particularly to a switch for controlling the operation of gaseous discharge lamps.

In gaseous discharge lamps, an electric current is passed through a gaseous medium between the electrodes of the lamp. In order to set such lamps in operation, it is necessary to ionize the gas therein so that it will conduct the current. Various methods have been used to cause the gas to be ionized, among them being the heating of the electrodes of the lamp. In such gaseous discharge lamps, the electrodes consist of filaments which may be heated by the passage of current therethrough.

One feature of the invention is to provide means for passing a current through the filamentary electrodes of the lamp when the lamp is to be set in operation. Another feature is to provide a single source of electrical energy from which the current passes through the filaments of the electrodes until the gas is ionized and will conduct the current, and from which the current thereafter passes between the electrodes. Another feature of the invention is to provide a switch in which a single movement of a plunger serves to cause the current to flow momentarily through the filaments of the electrodes and thereafter through the lamp between the electrodes. Still another feature is to provide in a switch a plunger which is movable from normal position to advanced position to cause the current to pass through the filaments of the electrodes and then through the lamp, the switch being also provided with means for continuously urging the plunger toward normal position.

Other features and advantages will appear from the specification and drawing, in which—

Fig. 1 is a schematic view of the circuit used; Fig. 2 is a vertical sectional view of the switch, the view being taken along the line 2—2 of Fig. 4; Fig. 3 is a vertical sectional view similar to the view of Fig. 2, showing the plunger in the switch in advanced position; Fig. 4 is a plan view of the switch casing showing the electrical connections therein, the view being taken along the line 4—4 of Fig. 2; Fig. 5 is a perspective view of the plunger and the other elements which are associated with the plunger in the switch casing; Fig. 6 is a vertical sectional view of the switch taken along the line 6—6 of Fig. 2; Fig. 7 is a fragmentary perspective view of the switch casing; Fig. 8 is a perspective view of the contact which is connected to the lamp electrode; and Fig. 9 is a perspective view of the contact which is used in momentarily passing a current through the filaments of the electrodes.

In the specific embodiment of the invention described herein, the circuit as illustrated in Fig. 1 includes a pair of wires 10 and 11 leading from

a suitable source of electrical energy (not shown). The current flowing through the wire 11 passes through the electrical connections 12 and 13 which are joined by the member 14, and then through a conventional choke coil 15 to the filament 16 of the gaseous discharge member 17.

Before the gas in the lamp 17 is ionized, the current flows from the filament 16 to the connection 18 through the contact member 19 and connection 20 to and through the other filament 21 of the lamp 17. After the gas within the lamp 17 is ionized, the current passes directly through the lamp from the filament 16 to the filament 21. The lamp is shown in Fig. 1 with the current passing in this manner and with the member 19 out of contact with the connections 18 and 20.

As seen particularly in Fig. 2, the switch 22 includes a casing 23 preferably of insulating material such as a plastic or hard rubber. A suitable closure member 24 may be provided for the casing. The closure member is held in position on the casing by a metal clip 25 (Fig. 6). The metal clip in turn supports a sleeve 26 which is provided with threads on the outside surface thereof and which threadedly engages the collars 27 and 28. A plunger 29 of a suitable insulating material is slidably received within the sleeve 26.

The pair of electrical contact members or connections 18 and 20 are disposed on opposite sides of the casing. These contact members, as seen particularly in Fig. 9, include a vertical plate 32 centrally apertured to receive a U-shaped spring clip 33. Recesses 34 and 35 are provided in the upper portion of the plate to receive the wires carrying the current.

Referring particularly to Figs. 5 and 6, the lower portion of the casing receives a conductor plate or rotor 35 which in turn supports a ratchet plate 36, the ratchet 36 being adapted to drive the rotor 35 in a single direction in a step-by-step motion of a quarter revolution at each step. The ratchet plate 36 is made of a non-conducting material. A spiral blade 37 is supported by the plate 36, the end of the blade 37 being received within the slot 38 in the plate 36. A contact member 39, secured to the lower portion of the plunger 29, is provided with a slot 40 within which the upper end of the blade 37 is received. A spring 41 is disposed within the plunger 29, resting on the member 39.

Electrical connections or contacts 12 and 13 are arranged within the casing and are adapted to be engaged by the rotor when in proper position. These contacts receive the lead in wires from the main circuit.

Referring now to Fig. 4, the contacts 18 and 20 receive the wires 44 and 45, while the contacts 12 and 13 receive the wires 46 and 47.

The casing 23 (Fig. 7) is provided with suitable

grooves 48, 49 and 50 for receiving the wires entering the same.

When the plunger is advanced to lower position, the contacts 18 and 20 are engaged by the member 39 to join the contacts and close the circuit of these connections. At the same time, the advancing of the plunger causes the spiral blade 37 to be turned and the plate 36 to be rotated. This produced rotation of the rotor 35 and causes the rotor to change position and open or close the circuit of the contacts 12 and 13.

The two pairs of contacts 18 and 20 and 12 and 13 thus act as circuit breakers. The contacts 18 and 20 are joined by the member 39 to close the circuit, and the contacts 12 and 13 are joined by the rotor 35 for the same purpose. The contacts 18 and 20 are arranged in parallel with the circuit of the lamp 17, so that current may pass through the lamp by passing between the electrodes thereof without passing through the contacts 18 and 20. These contacts, therefore, need to be closed only momentarily when it is desired to set the lamp into operation. The contacts 12 and 13, on the other hand, are arranged in series with the lamp so that the lamp may operate only when these contacts are joined.

When it is desired to set the lamp in operation, the plunger is moved to advanced position by manually pressing it downwardly, and the member 39, by engaging the contacts 18 and 20, closes the circuit of these contacts. At the same time, the turning of the rotor 35 caused by the rotation of the blade 37 and plate 36 joins the contacts 12 and 13 and closes the circuit thereof. The current now flows across the contacts 12 and 13 through the filament 16, then across the contacts 18 and 20 and through the filament 21. The filaments 16 and 21 are heated and the gas within the lamp ionized.

The current then begins to pass through the lamp between the electrodes 16 and 21, lighting the lamp. As soon as the plunger is released, the spring 41 urges it upwardly and the contacts 18 and 20 are separated to open the circuit thereof. The rotor 35 remains in a position of engagement with the contacts 12 and 13, maintaining the circuit thereof closed and permitting the current to pass through the lamp.

When it is desired to shut off the lamp, the plunger is again depressed, and the rotation of the blade 37, plate 36 and rotor 35 causes the contacts 12 and 13 to again be separated, thus opening the circuit of the lamp.

Whenever the plunger is depressed, the circuit of the contacts 18 and 20 is closed. This circuit is opened as soon as the plunger is released and rises to normal position. The moving of the plunger to advanced position also causes the contacts 12 and 13 to be alternately joined and separated. The return of the plunger to normal position has no effect upon this movement. Thus if the rotor is in position where it does not engage the contacts 12 and 13, the depressing of the plunger will cause these contacts to be joined. The next time that the plunger is depressed the contacts will be separated.

In operating a gaseous discharge lamp with this type of snap-on switch, it is necessary only to depress the plunger momentarily to set the lamp in operation. When the lamp is to be shut off, the same motion of the plunger serves to produce this result.

While there are shown and described certain embodiments of the invention, it is to be understood that it is capable of many modifications. 75

Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is intended to claim all novelty inherent in the invention as broadly as permissible, in view of the prior art.

I claim:

1. A switch for controlling the operation of gaseous discharge lamps and the like, comprising a casing having a longitudinal recess therein, a pair of contact members disposed on the sides of said recess and extending thereinto in spaced relation, said members providing a closed circuit when connected in electrically-conducting relation, a plunger mounted in said casing for longitudinal movement within the recess therein, means carried by said plunger for engaging said members and bringing the same into electrically-conducting relation to close said circuit, said members being yieldable to permit the plunger to pass longitudinally therebeyond within the recess while the circuit remains closed, a pair of electrical connections in said casing providing an open circuit when separated, a contact rotor rotatably mounted on said casing for step-by-step rotation therein, said rotor in successive steps of rotation being brought alternately to a position of engagement with said connections wherein said last-mentioned circuit is closed and a position of non-engagement with said connections wherein said last-mentioned circuit is open, said rotor being arranged in drive relation with said plunger whereby manual longitudinal movement of the plunger to advanced position within said recess rotates said rotor to move the same from one to another of said positions, and spring means for urging said plunger from advanced position to normal position.

2. A switch for controlling the operation of gaseous discharge lamps and the like, comprising a casing having a longitudinal recess therein, a pair of spring contact members disposed on opposite sides of an intermediate longitudinal portion of said recess and extending thereinto in spaced relation, said contact members being yieldable along the length of the recess when pressure is applied thereto, said members providing a closed circuit when connected in electrically-conducting relation, a plunger mounted in said casing for longitudinal movement within the recess therein, means carried by said plunger for engaging said members and bringing the same into electrically-conducting relation to close said circuit, the yieldability of said members permitting the plunger to advance longitudinally within the recess beyond the normal position of the members while said circuit remains closed, a pair of electrical connections in said casing providing an open circuit when separated, a contact rotor rotatably mounted in said casing for step-by-step rotation therein, said contact member in successive steps of rotation being brought alternately to a position of engagement with said connections wherein said last-mentioned circuit is closed and a position of non-engagement with said connections wherein said last-mentioned circuit is open, a spiral blade for causing rotation of said rotor, said plunger being provided with a slot receiving said spiral blade whereby reciprocating movement of the plunger imparts rotation to the blade and rotor, said plunger being manually movable to advanced position to move the rotor from one to the other of said positions, and spring means for urging a plunger from advanced position to normal position.

BERT K. NASTER.