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ELECTROMAGNETIC SWITCH

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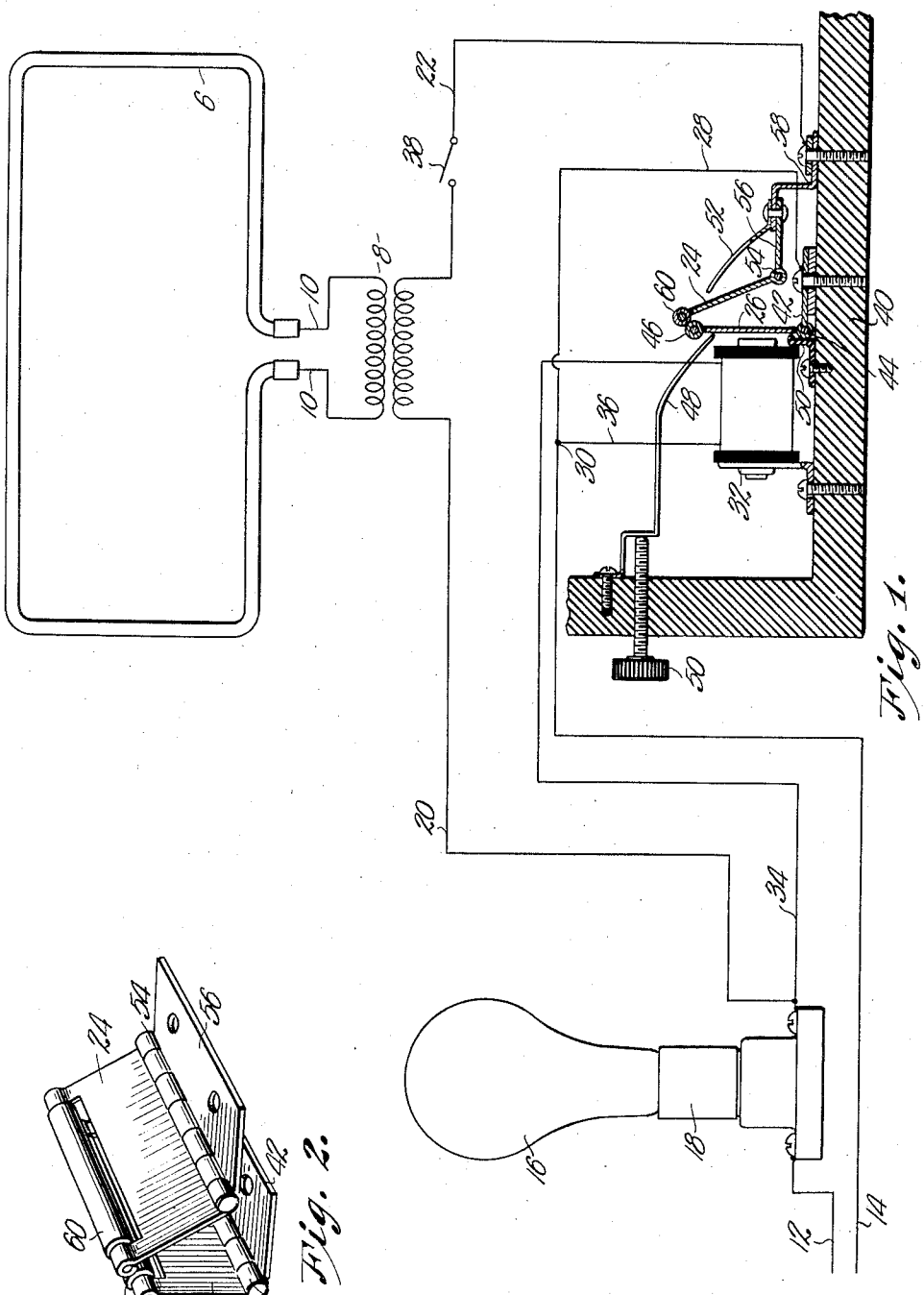


Fig. 1.

Fig. 2.

INVENTOR.
William Russell Spaulding
BY Howson & Hamilton
ATTORNEYS

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ELECTROMAGNETIC SWITCH

William Russell Spaulding, Kansas City, Mo.

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1 Claim. (Cl. 200—87)

This invention relates to electric lighting systems wherein a gaseous tube is employed and the primary object is the provision of means in the circuit of said systems for converting a steady or continuous flow of current from a source of supply into an intermittent or periodic flow, so a flashing effect is imparted to the gaseous tube without diminishing its intensity.

One of the important aims of this invention is the provision of electromagnetic means in a gaseous tube lighting system for establishing an intermittent flow of current to the tube and thereby setting up a flashing result which will not effect the brilliancy nor the desired intense color which is present when the gaseous tube is operating at its highest degree of efficiency.

An additional object of this invention is the provision of specially formed electromagnetically operated means for feeding an intermittent current to a gaseous tube that comprises a pair of specially formed armatures, one of which is under the influence of the electromagnet, while the other is associated with the first mentioned armature in such a way as to set up a current making and breaking action without the attendant results of affecting the efficiency of the gaseous tube with which the converting means is associated.

The effect of intermittent flow in electric signs or the like has been well-known for a long period of time, and flashers for incandescent lamps, and such signs have been developed to a point of near perfection. Since the advent of gaseous tubes for illuminating purposes however, the problem of setting up intermittent flow of current to these tubes without altering the brilliancy and desired affect, has been a troublesome problem. The present invention embodies concepts which permit the employment of current normally flowing through the system to operate the means for establishing an intermittent flow to the gaseous tube and therefore a desirable attention arresting vibration.

The specific form of electromagnetically operated converting means is important and forms some of the major objects of this invention. Such objects will appear during the course of the following specification, referring to the accompanying drawing wherein:

Figure 1 is a schematic view illustrating a flasher system and gaseous tube light which embodies the present invention; and,

Fig. 2 is a detailed perspective view of the interengaged switch contacts, forming a part of the current converting means.

The gaseous tube 6 with which the flasher system is used, may be of the ordinary type well-known to those skilled in the art, and may be of any desired form. Tube 6 is connected to transformer 8 through the medium of conductors 10 and the current supply circuit is attached to the ordinary line wires through the medium of conductors 12 and 14. In the illustrated embodiment, an electric lamp 16 having a conventional type flasher attachment 18, is in circuit with tube 6 merely for the purpose of completely stopping the flow of energy for short periods of time and thereby periodically darkening tube 6.

Wire 20 interconnects transformer 8 and lamp 16, which in turn is joined to conductor 12. The circuit to tube 6 is completed by way of wire 22, contact arm 24, armature 26, and wire 28 that is joined to the end of wire 14 at point 30.

Electromagnet 32 is in the form of a coil which is energized by current passing to the system through conductors 12 and 14. Wire 34 meets wire 20 near lamp 16 and wire 36 is connected to wire 14 at point 30 so that as long as lamp 16 is burning, electromagnet 32 is energized. Likewise, as long as lamp 16 is burning, current is passing to transformer 8 and thence to tube 6.

A switch 38 is supplied so that the system may be rendered inoperative as desired.

The electromagnetically operating means for converting the flow of current through the circuit, above mentioned, from a steady flow to an intermittent one, is in the nature of an armature 24 and a contact 26. Arm 26 is pivotally mounted to any suitable base 40, and in the instance shown, plate 42 is hingedly joined as at 44 to the lower edge of armature 26 which normally rests in a substantially vertical position. The upper or free edge of armature 26 carries a roller 46 and this upper edge is engaged by a resilient finger 48 which may be adjusted by thumb screw 50 to hold armature 26 in a predetermined position a short distance from coil 32.

The thumb screw 50 acting through resilient finger 48 limits the movement of armature 26 toward coil 32 and the movement of armature 26 from coil 32 is limited by contact arm 24 and the resilient stop 52 against which it strikes.

Contact arm 24 is mounted upon base 40 in the manner shown, and the lowermost edge thereof is hingedly connected as at 54 to a plate 56, which in turn is supported by bracket 58. The free edge of contact arm 24 is provided with a roller 60 which rests against roller 46 of armature 26.

The angle of inclination of contact arm 24 is

such as to employ the action of gravity to keep the free, roller-bearing edges of contact arm **24** and armature **26** in engagement.

When current is passing through the system, electromagnet **32** is constantly energized, to draw armature **26** against finger **48** which is flexed to build up energy just sufficient to overcome the pull of electromagnet **32** after armature **26** has moved a short distance toward electromagnet **32**. Stop **50** precludes the possibility of armature **26** being held against the pole-face of armature **32**. Therefore, armature **26** flutters under the influence of electromagnet **32** and finger **48**. Contact arm **24** follows the free edge of armature **26** but the speed of travel between **24** and **26** is different and therefore a rapid make and break action occurs which causes the current reaching tube **6** to flow intermittently.

It is obvious that the use of lamp **16** and its associated flasher **18** is not at all necessary to the efficient and desired operation of the electromagnetically actuated armature **26** and contact arm **24**, and it is further clear to one skilled in the art, that the means just described may be employed with other electric hook-ups so as to present desirable effects at the tube **6**.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

An electromagnetic switch for electrical circuits comprising an electromagnet; a vertically disposed armature, hinged at its lower end to permit the upper free end thereof to move toward and from the electromagnet; a roller on the face end of the armature extending along the full length of the longitudinal edge thereof and constituting a contact member of the switch; an inclined contact arm mounted to have one end thereof freely movable toward and from the armature and normally held by gravity against the roller on the armature; a roller on the said one end of the contact arm extending along the full length of the longitudinal edge thereof and in engagement with the roller on the armature; a stop to limit the movement of the armature toward the electromagnet to preclude direct contact of the former with the latter; a spring to yieldably hold the armature a predetermined distance from the electromagnet, said spring serving to force the armature from the electromagnet after the spring has had energy established therein by movement of the armature toward the electromagnet; and a resilient stop against which said contact arm strikes as it approaches the end of its path of travel farthest from said electromagnet, whereby said resilient stop serves to force the contact arm to return toward the electromagnet and aramature after the resilient stop has had energy established therein by movement of the contact arm away from the electromagnet and armature.

WILLIAM RUSSELL SPAULDING.