May 4, 1954 F. J. SOUTHERN 2,677,731

ELECTRIC SWITCH

Filed May 25, 1951 3 Sheets-Sheet 1

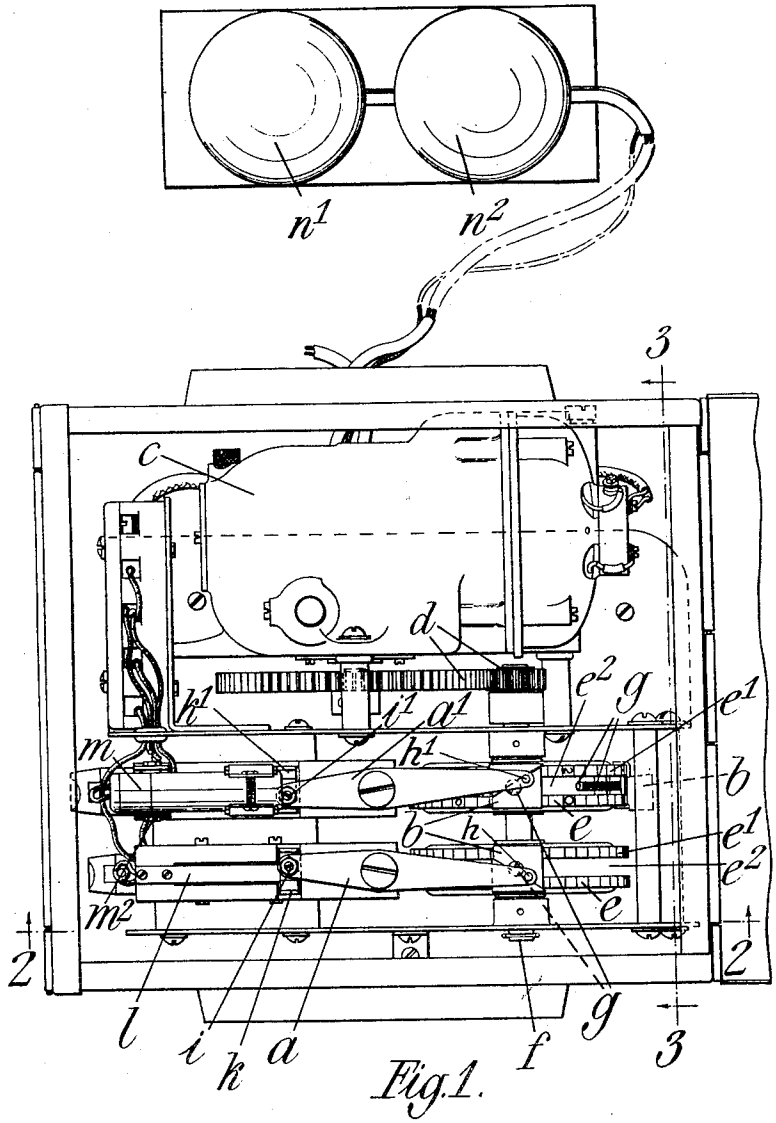


Fig. 1.

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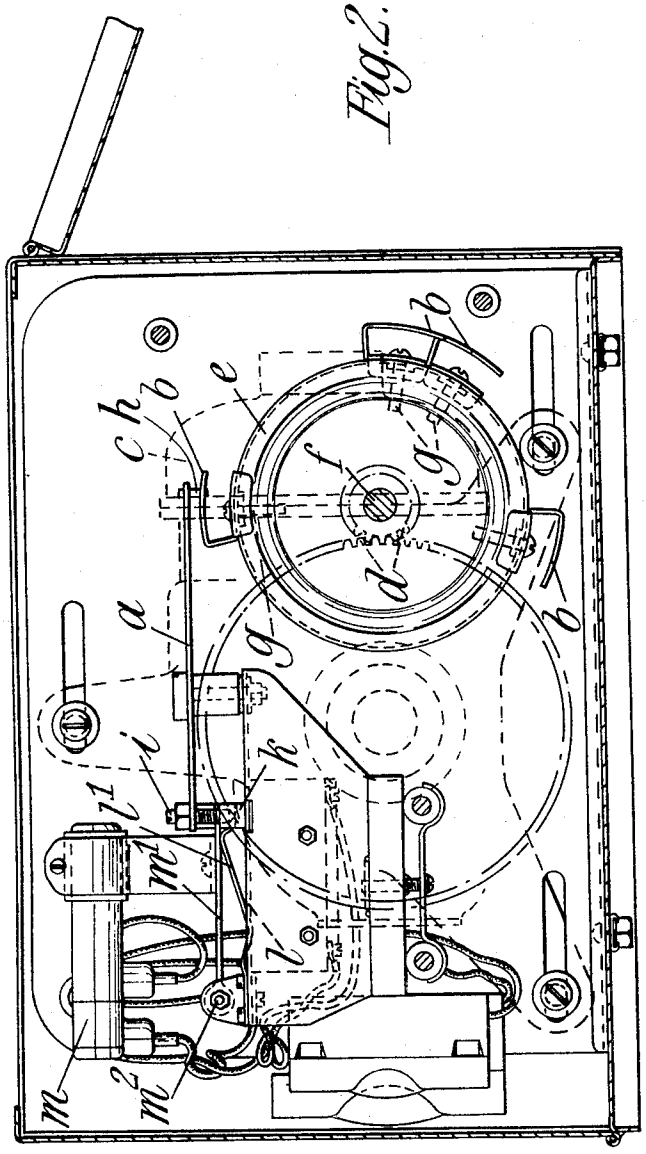
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May 4, 1954 F. J. SOUTHERN 2,677,731

ELECTRIC SWITCH

Filed May 25, 1951 3 Sheets-Sheet 2

Fig. 2.



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ELECTRIC SWITCH

Filed May 25, 1951 3 Sheets-Sheet 3

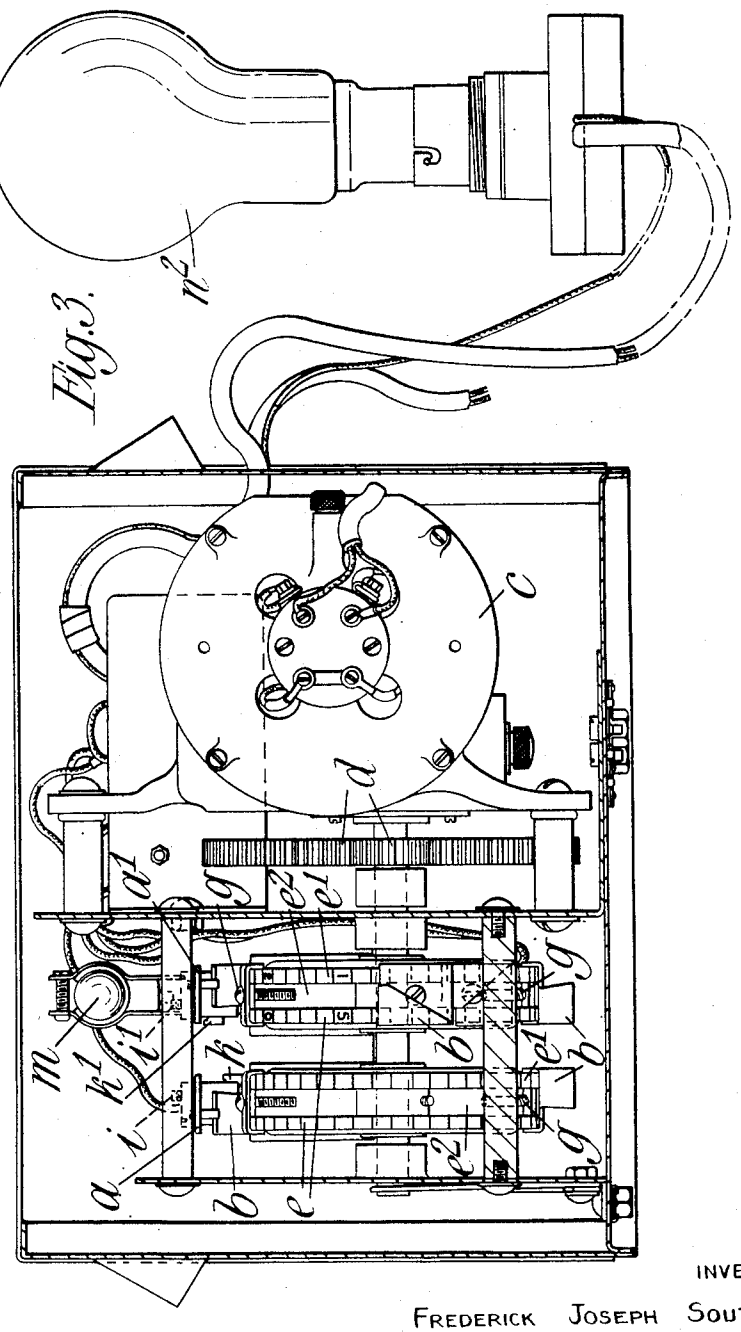


Fig. 3.

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UNITED STATES PATENT OFFICE

2,677,731

ELECTRIC SWITCH

Frederick Joseph Southern, Feltham, England

Application May 25, 1951, Serial No. 228,168

Claims priority, application Great Britain May 30, 1950

2 Claims. (Cl. 200—38)

1

This invention relates to electric switches and has for its object to devise simple and effective means for controlling electric circuits so that they are "on" and "off" for any predetermined period of time or cycle.

The invention consists in an electric circuit controller comprising a switch or switches and an electric motor driven cam wheel or wheels adapted to actuate the switch or switches so that the circuit or circuits may be "on" and "off" for any given periods of time or through any predetermined cycle.

Apparatus in accordance with the invention finds numerous applications particularly where flashing signals are required or where changes are to be periodically effected from one circuit to another. Among such applications may be mentioned flashing signs for advertising or other purposes, aerodrome beacon warnings, traffic signals, call signals, animated displays, coloured light changing, advertising involving the changing of letters, words, or figures in electric lamps, and many similar purposes.

A further feature of the invention consists in arranging the cam or cams to be angularly adjustable on the wheel or wheels so as to vary the periods of time or cycles of operation of the switch or switches.

Still further features of the invention will be apparent from the description given hereafter.

The accompanying drawings illustrate one convenient form of apparatus in accordance with the invention.

Figure 1 is a plan with the cover opened.

Figure 2 is a section on the line 2—2 of Figure 1, and

Figure 3 is a section on the line 3—3 of Figure 1.

In carrying my invention into effect in one convenient manner and in one of its simplest forms, I arrange the circuit or circuits to be controlled by a micro-switch, a mercury switch, or other suitable form of switch, and such switch in turn is actuated to the "on" and "off" positions by side-ways movement of a lever arm (a or a'). Such side-ways movement is produced by a cam or cams b carried on the periphery of a wheel which is driven from an electric motor c through convenient reduction gearing d and which may be calibrated to indicate periods of time or cycles of operation. In the particular arrangement shown the wheel consists of two flanged discs e, e' mounted upon a shaft f driven by the electric motor c, the flanges being spaced apart to provide a slot e^2 in which the cam members b are secured by screws g or in any other suitable manner allowing for angular adjustment of the cams round the periphery of the wheel.

2

In a specific construction in which the switch is required to be put on and off once only in a revolution of a cam wheel, there would be two cams and one cam would be inclined to move the lever arm to one side while the other cam is oppositely inclined to move the lever arm to the other side. In Figure 3 the right hand cam wheel is shown with two such oppositely inclined cams close together.

As above indicated the cam-operated arms may actuate any suitable type of switch. Thus in Figure 1 the lever arm a (which is moved by the cams b through the latter striking against a pin or projection h at one end of the lever arm) operates a micro-switch z (Figure 2) for which purpose the arm carries a screw i or other preferably adjustable projection which acts upon an inclined member k carried by a leaf spring l, the arrangement being such that movement of the arm a to one side depresses the member k which acts upon the micro-switch to close the same, while movement of the arm in the reverse direction allows the leaf spring l to raise the member k and thus allows the micro-switch to open.

The lever arm a' in the drawing is shown as actuating a mercury switch m, for which purpose the arm carries at one end a pin or projection h' acted on by the cam or cams, while at the other end of the arm there is an adjustable projection i' adapted to act upon an inclined member k' carried by a spring l' which normally supports a member m' pivoted at m^2 and carrying the switch m. The arrangement is such that movement of the arm a' to one side depresses the member k' and allows the switch m to tip to the "on" position, while movement of the arm to the other side raises the switch to the "off" position. For simplicity of drawing only two lamps n', n^2 are shown, one being controlled by the micro-switch and the other by the mercury switch. It will be understood, however, that one switch may control two or more circuits with the same or different coloured lamps, and that the cycles of operation and periods of cycles will be determined by the number of cams employed and their angular spacing, one from another. With the arrangement described it will be seen that the cams operate only momentarily to operate the switch.

It will further be understood that the invention is not limited to the applications above de-

scribed by way of example as the invention may be applied to the control of a single circuit or to the control of any number of circuits, and I may vary the number and construction of switches, the number of cam wheels, and the number of cams on each individual wheel, depending upon the number of circuits required or any practical conditions that may have to be fulfilled.

I claim:

1. An electric switch comprising a wheel, an electric motor for driving the wheel, a lever having its pivotal axis at right angles to the axis of rotation of the wheel and mounted with its length in the tangential direction in relation to the wheel and with one part adjacent the circumference of the wheel, a cam mounted on the periphery of the wheel so as to be adjustable therearound and adapted to engage the lever for the purpose of turning the lever, an adjustable projection on the lever extending parallel to the pivotal axis of the lever, a member carried by a spring and engaged by said projection so that movement of the lever in one direction depresses said member and movement of the lever in the other direction allows the spring to raise the member carried thereby, and a switch adapted to be operated by the said member.

2. An electric switch comprising a wheel, an electric motor for driving the wheel, a lever arm having its pivotal axis at right angles to the axis of rotation of the wheel and mounted with its length in the tangential direction in relation to the wheel and with one part adjacent the circumference of the wheel, two cams mounted on the periphery of the wheel so as to be adjustable therearound and adapted to engage said part of the lever, one of said cams being inclined to move the lever arm to one side and the other of said cams inclined to move the lever arm to the other side, and a switch adapted to be operated by said lever when the lever is moved by means of a cam.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,669,509	Eyrse	May 15, 1928
1,970,432	Porter	Aug. 14, 1934
2,212,868	Strong	Aug. 27, 1940
2,293,890	Leonard	Oct. 13, 1942
2,359,059	Somes	Sept. 26, 1944