No. 652,151. Patented June 19, 1900.

P. S. TIRRILL.

AUTOMATIC ELECTRIC SWITCH.

(Application filed Sept. 23, 1899.)

(No Model.) 2 Sheets—Sheet 1.

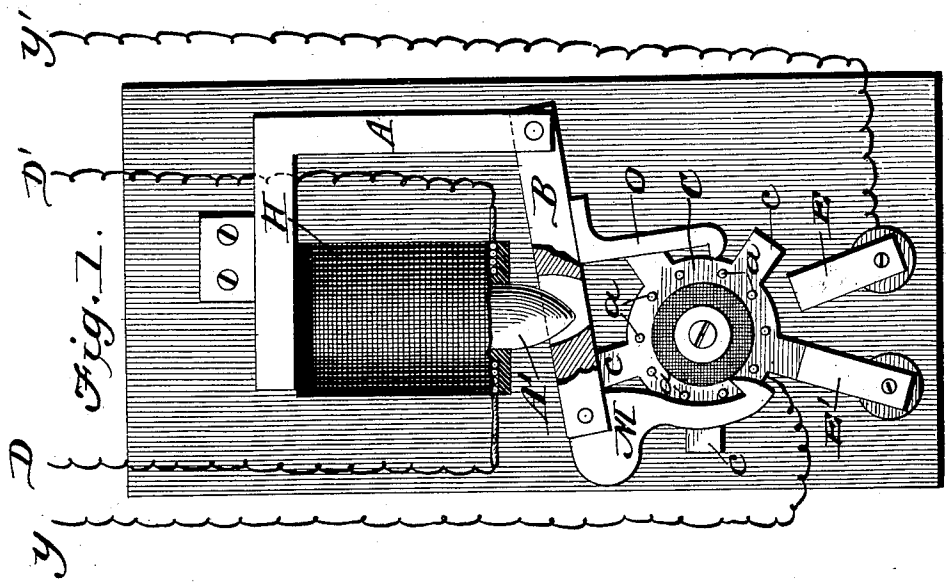


Fig. 1.

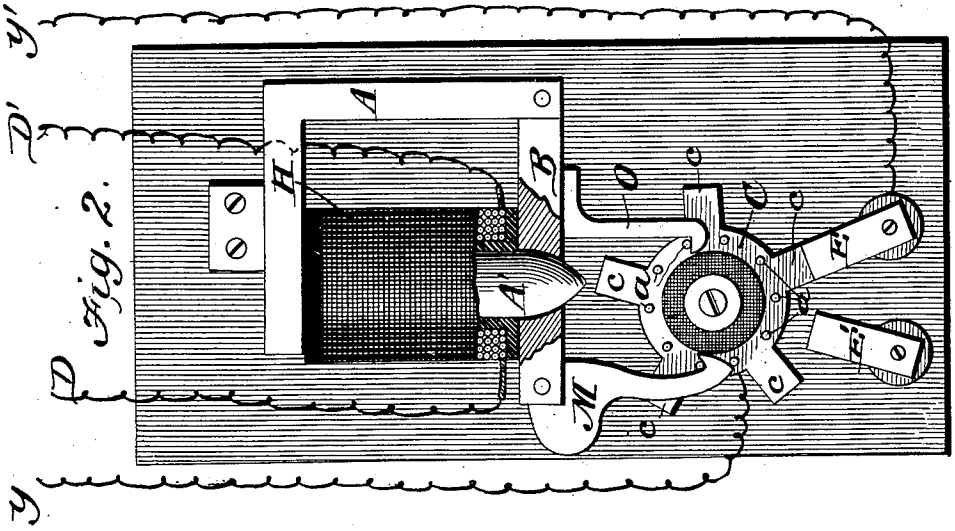


Fig. 2.

WITNESSES:

W. D. Blondell

Edw. W. Byrn.

INVENTOR

P. S. Tirrill.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 652,151. Patented June 19, 1900.

P. S. TIRRILL.

AUTOMATIC ELECTRIC SWITCH.

(Application filed Sept. 23, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

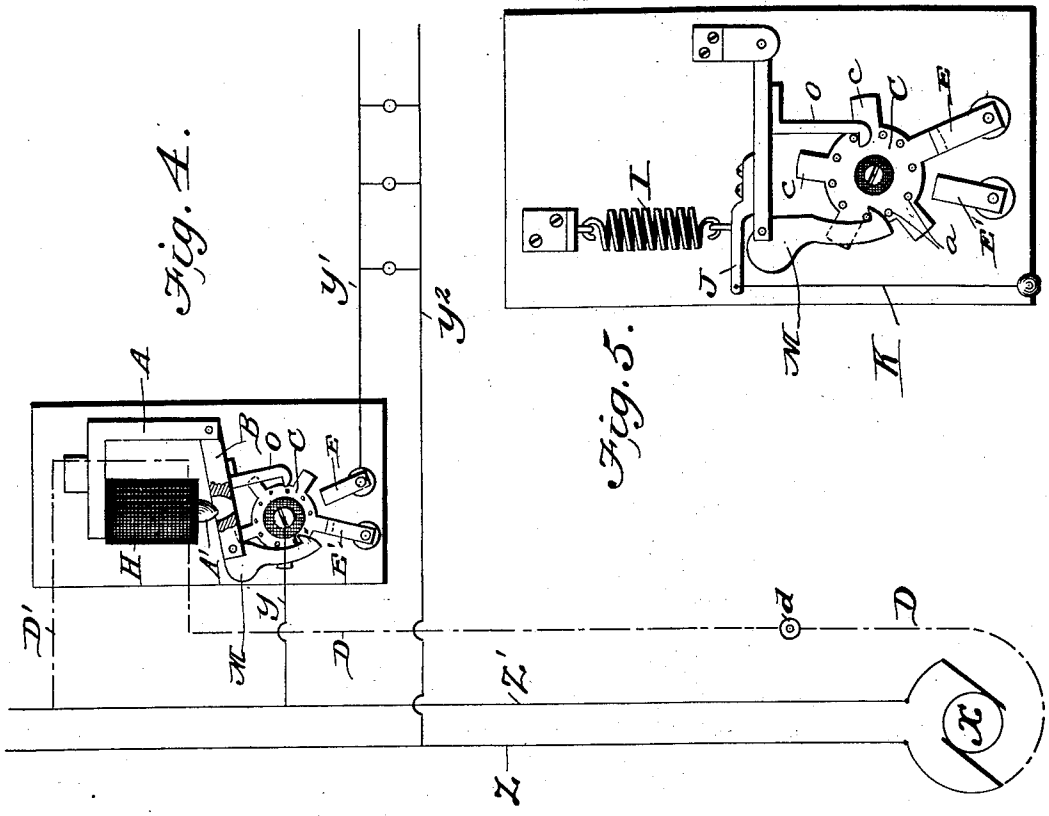
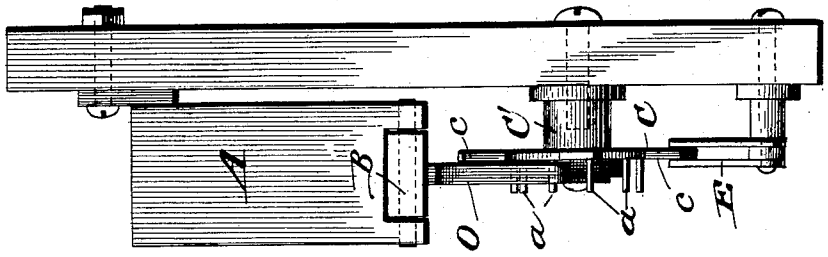


Fig. 5.

Fig. 3.



WITNESSES:

W. L. Blondell.

Edw. W. Byrn

INVENTOR

P. S. Tirrill.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PHILL S. TIRRILL, OF GROVETON, NEW HAMPSHIRE, ASSIGNOR OF ONE-HALF TO FRED W. McDONALD, OF SAME PLACE.

AUTOMATIC ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 652,151, dated June 19, 1900.

Application filed September 23, 1899. Serial No. 731,441. (No model.)

To all whom it may concern:

Be it known that I, PHILL S. TIRRILL, of Groveton, in the county of Coos and State of New Hampshire, have invented a certain new and useful Improvement in Automatic Electric Switches, of which the following is a specification.

My improvement is intended especially for an automatic switch which is employed for controlling one or many lamps at any distance from the central station which otherwise would be impractical on account of cost of wiring and copper.

The object of my invention is to provide a switch delicate in operation and substantial in construction and yet simple and cheap.

In practice it is often desirable to operate the so-called "long-burning" arc-lamps from the regular mains and control them from a predetermined point—for instance, from the central station. It is often desirable to install arc-lamps on the regular mains and at the same time control them from a predetermined point. Lamps can be controlled from any predetermined point by simply running one iron wire from said point to where the lamp or lamps are located. A relatively-light wire of sufficient cross-section to stand the mechanical strains and the inclemency of the weather is all that is required to operate the switch. The said switch requires no energy only for the instant that it is in operation, it being understood that this switch can be made either single, double, or three pole. It can also be used as an entrance-switch, and at places where the entrance is effected at inconvenient places to get at quickly this switch is especially valuable. By the use of this switch a push-button can be located at any convenient place, and the entrance-switch may be operated at any convenient predetermined point. It can be also used in connection with series incandescent or series arc lamps to light or extinguish any one or more lamps at the will of any person in charge of the same. It can also be used as a three-point switch or what is called a "lazy-man's" switch.

My invention consists in the peculiar construction and arrangement of the switch, which I will now proceed to describe with reference to the drawings, in which—

Figures 1 and 2 are side views of the switch, partly in section, showing two positions of the same. Fig. 3 is an edge view of the same. Fig. 4 shows the application of the switch to the circuit of the dynamo and electric lamps, and Fig. 5 is a side view of a modification.

In the drawings, Figs. 1 and 2, A represents a right-angular iron frame having a core A′ surrounded by a helix of insulated wire forming an electromaget H, the core being extended beyond the helix in conical form. B is an armature hinged at one end to the iron frame A and having an opening through it to receive the conical end of the core. To the outer end of the armature is hinged a hook-shaped catch M, hanging in suspended position, and facing the same there is another pendent hook O, rigidly attached to the lower side of the armature. C is a rotating brass switch-plate having five (more or less) radial lugs or tongues *c*. This five-pronged switch is mounted on an insulating-stud C′ and has on its face laterally-projecting pins *a*, double in number to the number of tongues *c* on the plate. This switch-plate C is arranged below the armature and with its circle of pins *a* between the two hooks M and O. Just below the switch-plate C there is a pair of parallel brass jaws E, and another pair E′ is so arranged that the tongues *c* of the switch-plate will pass between their respective jaws and bind against their inner adjacent faces with a frictional contact. The first of these jaws, E, are electrical contacts, connecting with the circuit-wire Y′. The other pair, E′, are located at a distance from the jaws E about equal to one-half the space between the ends of two tongues *c c* of the switch-plate. This pair of jaws E′ has no electrical function whatever, but acts simply as a brake to arrest the momentum of the switch-plate when any one of these tongues *c* passes out from between the contact-jaws E. D D′ are circuit-wires which connect with the helix of the electromagnet H and represent the circuit through which the switch is operated from a distance. Y and Y′ are other circuit-wires, in which are included the lamps

to be lighted or put out by the switch. The wire Y is in electrical connection with the switch-plate C and the wire Y′ with the jaws E, and when the plate C is turned so as to place one of the tongues *c* between the jaws E, as in Fig. 2, the lamp-circuit is closed and the lamps lighted, and when the plate C is turned as in Fig. 1 the lamp-circuit is broken and the lamps are put out. This plate C is rotated with a step-by-step motion, one movement lighting the lamps and the next one putting them out, as follows:

Referring to Fig. 4, X is the dynamo, whose opposite brushes are connected to the main wires Z Z′. D is a small iron wire connecting with one of the terminals of the switch-magnet H, located at a point more or less remote from the central station or place from which the lamps are to be operated. The other terminal of the electromagnet is connected by a wire D′ with one of the wires Z′ of the main line, the wire D being connected to the other wire Z or the brush of the dynamo corresponding thereto. The circuit D D′ is normally open, but has in it at any suitable point, as *d*, a push-button, by which its circuit may be temporarily closed. When so closed, the electromagnet H, being energized, attracts the armature B, and this, rising, causes the hook M to engage one of the pins *a* of the switch-plate C and through it turns the plate C until one of its tongues is brought between the jaws E, as shown in Fig. 2, closing circuit Y Y′ Y^2, Fig. 4, and lighting the lamps. When the circuit in D D′ is broken by a release of the push-button, the armature B drops down again for a fresh hold on the next pin *a*, as shown in Fig. 1. To put out the lamps, it is only necessary to close the push-button *d* again, and this by a further movement of the plate C takes the tongue *c* from between the jaws E, breaking the electric circuit Y Y′ Y^2 and causing the said tongue to be caught and retained by the brake-jaws E′. These brake-jaws E′ serve to prevent the quick action of the armature on the plate C from throwing it too far and insuring the stoppage of the plate C out of contact with the jaws E on every alternate movement and holding the plate C stiffly, so that the hook M can move downwardly over the pins *a* without turning the plate C backward when in the position shown in Fig. 1. When the hook M lifts a pin or plate C, the latter is prevented from being thrown too far by the other hook O, which by the same movement engages a pin on the other side of the plate and acts as a stop to the plate.

As a modification of my invention I may actuate the plate C by hand, as shown in Fig. 5, in which J is an arm fastened to the armature, held up by a spring I, and drawn down by a pull-cord and ring K. On heavy inductive currents the switch is immersed in oil to prevent destructive sparking.

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

1. An electric switch consisting of an intermittently-rotating plate with projecting tongues or lugs and two frictional bearing-points for said tongues located a distance apart to contact alternately with the tongues, one of said bearing-points being a circuit-terminal, and the other a stationary brake, and means for giving a step-by-step motion to the rotary plate substantially as and for the purpose described.

2. An electric switch consisting of an intermittently-rotating plate with tongues or lugs and laterally-projecting pins, two bearing-points for said tongues located a distance apart to contact alternately with the tongues, one of said bearing-points being a circuit-terminal and the other a brake, and a hinged arm bearing two hooks operating on the pins on opposite sides of the plate substantially as described.

3. An electric switch consisting of an intermittently-rotating plate having radial tongues and laterally-projecting pins, two pairs of clamping-jaws forming bearing-points for the tongues, one pair of jaws being an electric terminal, and the other a brake, and arranged to alternately come into bearing with the tongues, and a hinged vibrating arm with pendent hooks engaging with the laterally-projecting pins substantially as and for the purpose described.

4. An electric switch, comprising an electromagnet with hinged armature bearing pendent hooks, a rotating plate with radial tongues and laterally-projecting pins, and two bearing-surfaces for the tongues, one being an electric terminal and the other a brake substantially as described.

5. The combination with the two main wires Z Z′ of a dynamo-circuit and a remote lamp-circuit Y Y′ Y^2; of a small wire D leading from a predetermined point to the remote lamp-circuit and having a switch or push-button *d*, and an automatic switch consisting of an electromagnet arranged in the circuit of the small wire D, an armature with two pendent hooks M and O, a rotating plate C with radial tongues and laterally-projecting pins, and two pairs of jaws one forming a terminal for the lamp-circuit, and the other a brake substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PHILL S. TIRRILL.

Witnesses:
E. EMURNEBE,
MERRILL SHURTLEFF.