

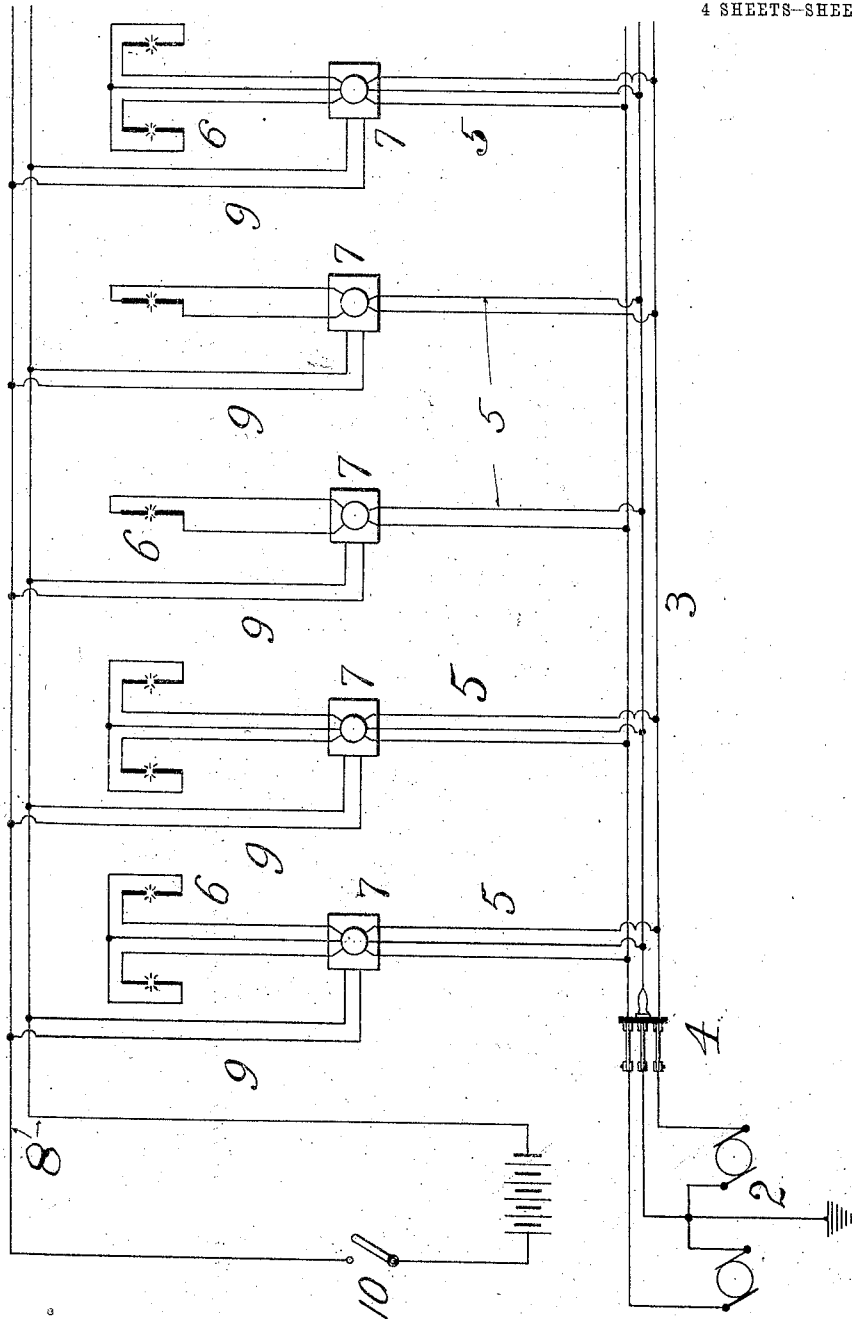
H. B. KAHN.
ELECTRIC CIRCUIT CONTROLLING SYSTEM.
APPLICATION FILED FEB. 19, 1909.

1,034,119.

Patented July 30, 1912.

4 SHEETS-SHEET 1.

Fig. 1.



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by

Inventor:

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T. F. Bourne, his Atty.

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4 SHEETS-SHEET 2.

Fig. 2.

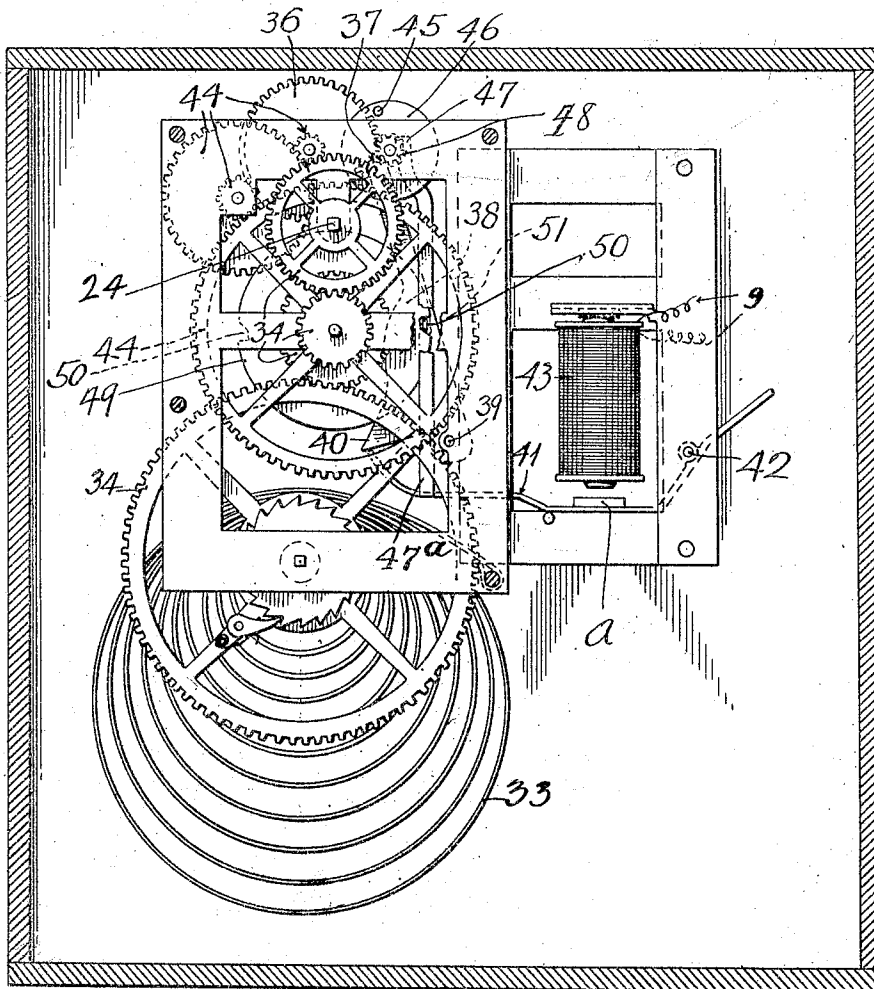
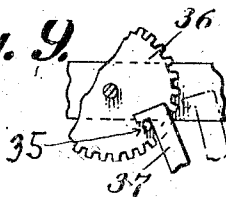


Fig. 9.



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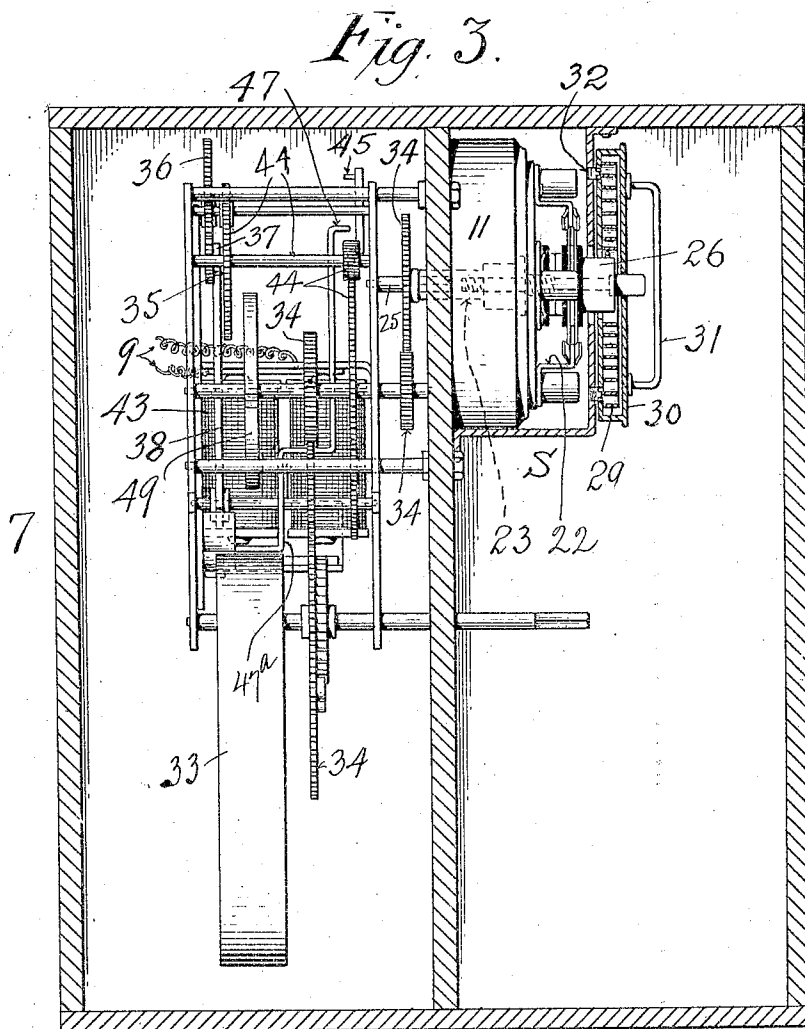
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4 SHEETS-SHEET 3.



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4 SHEETS-SHEET 4

Fig. 1.

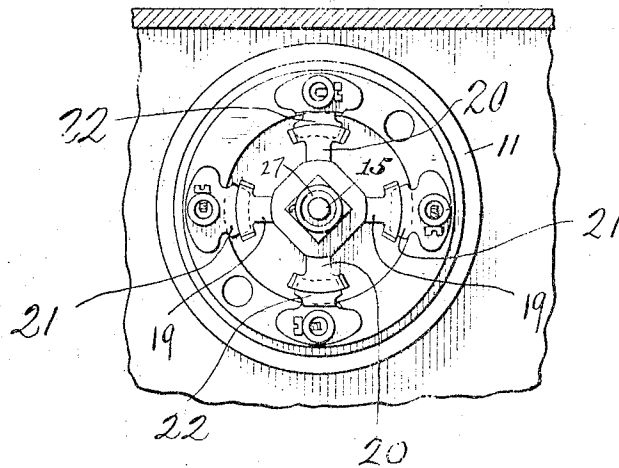


Fig. 6.

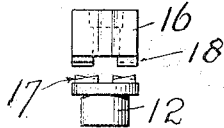


Fig. 7.

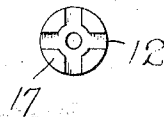
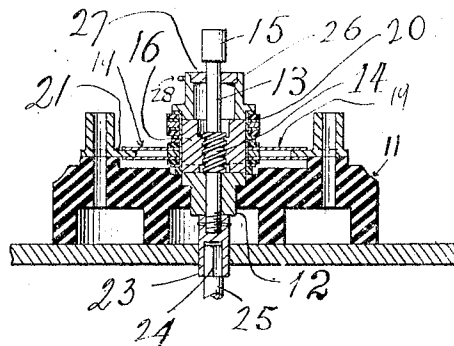


Fig. 8.



Fig. 5.



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UNITED STATES PATENT OFFICE.

HARRY B. KAHN, OF NEW YORK, N. Y.

ELECTRIC-CIRCUIT-CONTROLLING SYSTEM.

1,034,119.

Specification of Letters Patent.

Patented July 30, 1912.

Application filed February 19, 1909. Serial No. 478,815.

To all whom it may concern:

Be it known that I, HARRY B. KAHN, a subject of the Czar of Russia, and resident of New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric-Circuit-Controlling Systems, of which the following is a specification.

10 The primary object of this invention is to enable a person to throw into and out of circuit or operation at will at a distant point or points one or more electrical translating devices, such as arc-lights, motors, incandescent lights, etc.; another object is to provide means which will require comparatively little attention during long periods of time, for throwing into and out of operation such translating device or devices; 20 other objects will appear hereinafter.

The invention comprises novel improvements and combinations of devices hereinafter described and more particularly pointed out in the appended claims.

25 The invention is embodied in the apparatus illustrated in the accompanying drawings, forming part hereof, in which—

Figure 1 is a diagrammatic illustrative view; Fig. 2 is a side elevation of a motor for controlling the switch of the translating device; Fig. 3 is a front elevation of said motor, partly in section; Fig. 4 is a plan view; Fig. 5 is a central sectional view of the switch shown in Fig. 4, and Figs. 6, 7, 8 and 9 are detail views of parts of the switch.

30 The diagram, Fig. 1, shows a generator 2, mains 3, and a switch 4, of any usual or desirable type or construction. In the particular instance illustrated, the mains 3 are connected by wires 5 with arc lights 6, but it is obvious that other forms of translating devices may be substituted for the lights shown, and the main line circuits otherwise arranged without departing from this invention. 7 indicates switch boxes in the branches or circuits 5 for connecting and disconnecting the translating devices to and from the circuits. 8 designates an auxiliary circuit shown connected by branches 9 with said switch boxes 7, as hereinafter more fully set forth. Any suitable form of circuit-closer, as a push button or other form of switch 10 may be used at a convenient point in the circuit 8 to control the current therein. As will appear hereinafter, the

turning on and off of current in circuit 8 by closing the switch at 10 either turns on or off the current from the circuit 3 to the translating devices. That is, successive closures and openings of the switch 10 causes alternate operations in the switch boxes 7, at one time connecting the translating devices with the source 2 of electrical energy, and the next time disconnecting the said devices from said source 2, and so on in alternation. It is obvious that the translating devices may be divided into two or more groups, and that each of said groups may have its own circuit 8 and circuit closer 10, whereby such groups may be connected to and be disconnected from the generator in any order of succession, thereby increasing or decreasing gradually the loads on said generator. It is also obvious that the number of translating devices in a group may vary from one to any convenient number.

The specific means shown in the drawing for connecting and disconnecting the translating devices to and from the mains will now be described.

S designates a switch, which, in the instance illustrated, is of the "snap-switch" type, (see Figs. 3, 4 and 5). This switch has a base 11 of insulating material, having a central metal bearing 12 for the shaft 13. The said shaft 13 is provided with a quick thread 14 and a head 15. Engaging with thread 14 is a nut 16, and the opposing faces of bearing 12 and nut 16 are toothed at 17, 18 to form a lock-device for preventing the nut 16 from being turned (the bearing 12 being fast to base 11, as will be understood) except as hereinafter set forth. The nut 16 is polygonal in horizontal section, or is otherwise arranged to have attached thereto the blades 19, 20 of the switch. These blades 19, 20 are insulated from each other and are arranged to bridge the terminals 21, 22 on different levels of branch lines, or negative and positive conductors, such as 5, connected with the mains 3. At its lower end (Fig. 5) shaft 13 has attached or connected to it a sleeve 23, which is shaped internally to fit on the polygonal head 24 of a shaft 25 of the motor shown. The nut 16 is allowed a limited motion along shaft 13 by the lock-sleeve 26 and a keeper 27, such limited motion being for the purpose of allowing the thread 14 to lift the teeth 18 out of mesh with the teeth 17, the nut 16 sliding in the blades 19, 20 at such

times. The sleeve 26 has a pin 28 thereon to receive one end of a spring 29 whose other end is hooked on a pin on the inside of the drum 30. Said drum 30 is provided with a handle 31 by which it is turned to wind said spring 29, and the spring is prevented from unwinding by means of a suitable pawl and ratchet device 32. The shaft 25 is driven, in the instance illustrated, by a spring 33 and clock-gearing 34.

The springs 29 and 33 may be, and preferably are, of such lengths and the constructions of the gear of said mechanical motor and switch of such numbers, that, when fully wound up, they will operate the parts driven by them for a great number of times, as for several months, or a year or more, in the case of street lighting systems.

Primary and secondary locking devices or detents are provided for the purpose of causing shaft 25 to be operated only as and when desired, and detents suitable to the purpose, with operating means therefor, will now be described. The primary or normal locking device shown comprises a pin 35 on a gear 36 and a coacting dog 37 on a lever 38, which is fulcrumed at 39, and which is provided with a toe 40 for co-action with an armature lever 41. The lever 41 is fulcrumed at 42 and is actuated by an electromagnet 43 in circuit 8, or a branch 9 thereof. The gear 36 is connected with a gear of the train 34 by gearing 44. In the normal positions of the parts, the dog 37 is in engagement with pin 35 and locks the train 34 against motion. The auxiliary or secondary lock or detent comprises a pin 45 on the side of a disk 46 and a dog 47 which is normally out of the circular path of said pin 45. The dog 47 is carried by an extension 47^a of the armature lever 41. The disk 46 is connected by gear 48 with gear 36. The pin 45 is so placed with relation to the pin 35 and dogs 37 and 47 that pin 45 will not be arrested on the operation of the device as hereinafter set forth until the pin 35 shall have moved so far as to be clear of dog 37 on the deenergizing of magnet 43.

In order to allow the mechanism a proper time interval in which to rotate shaft 25 and disengage nut 16 from bearing 12, after magnet 43 releases lever 41, the dog 37 is held out of the position in which it coacts with pin 35 by any convenient means, as, for instance, a disk 49 having one or more notches 50 in its periphery to receive a lug 51 on the side of lever 38. As long as lug 51 bears on the circular periphery of disk 49, dog 37 is held out of the path of pin 35, but when a notch 50 comes opposite lug 51, the dog 37 drops (or is spring-moved) into the path of pin 35 and stops the mechanism.

The operation of the above described devices is as follows: When it is desired to start or stop the translating device (or de-

vices) operated by any particular circuit 8, the switch 10 for that circuit is closed, thus energizing magnet 43 of that circuit and causing it to attract its armature 41 and lever 41, thereby operating lever 38 and disengaging lug 51 from notch 50 and dog 37 from pin 35, while simultaneously moving dog 47 in to the path of pin 45, whereupon spring 33 drives the gearing until pin 45 is arrested by dog 47, the train ceasing to operate; as long as the circuit is kept closed, the parts remain as just described, it being understood that the pin 35 has moved away from the position it occupied when in engagement with the dog 37 and that the like is true of the notch 50 and lug 51. On opening circuit 8, the magnet 43 releases the lever 41, which falls, or is moved to its normal position by the pressure of pin 45 on dog 47, thus causing dog 47 to release pin 45 and allowing lug 51 to ride against the periphery of the disk 49, and thereupon spring 33 drives the train 34 and thus rotates shaft 25 in the direction necessary to cause the nut 16 to move away from the bearing 12 until teeth 13 are disengaged from teeth 17, whereupon spring 29 rotates sleeve 26 and switch blades 19, 20 forward or in the direction necessary to cause nut 13 to run down thread 14, whereby the teeth 18 are moved from one set to another set of kerfs or notches between the teeth 17. Simultaneously with the snapping of teeth 18 into teeth 17 as just described, the lug 51 falls into a notch 50 and the dog 37 stops pin 35 and shaft 25. Assuming that the described operations turn on the current at the translating device, the switch contacts or blades 19, 20 have moved from positions midway between their respective coacting terminals 21, 22, (at which position the main line circuit was broken) into contact with such terminals to close such circuit. If now the circuit 8 be again closed and opened, precisely the same cycle of operations ensues except that the switch blades 19, 20 are moved from positions wherein they are in contact with terminals 21, 22 to positions in which they are between and out of contact with them. In the instance illustrated the blades 19, 20 move in different planes, and their co-acting terminals are in these planes, whence it follows that the blades are over or under each other's terminals when said blades are in their inoperative positions. The particular switch S shown has four terminals and two sets of switch blades, but the same principle applies where six terminals and three sets of switch blades are used, as in three-wire systems, and the switch contacts or blades and terminals will be appropriately arranged where the translating devices are arranged in series in the main circuit, instead of in multiple as illustrated. By means of my improvements a large

number of lights (or other translating devices) may be thrown into a main line circuit from a central or power station by merely closing and opening switch 10; and such lights or devices may be thrown out of circuit when desired by again closing and opening switch 10. Thereby the expense and delay of requiring a man to go around and turn on or off the current for each light is avoided.

While I have shown a circuit, such as 8, 9, for controlling magnets 43, it will be understood that my invention contemplates utilizing the so-called wireless circuit or system with suitable receiver for controlling magnets 43 or their equivalent.

The switch 10 may be operated by any suitable clock-controlled mechanism for periodically operating the switch, thereby obviating the necessity of a person operating the switch at intervals of times, while still permitting the switch to be manually operated as might be required.

What I claim as new and desire to secure by Letters Patent is:

1. The combination of a spring-driven snap-switch, a motor to drive the switch, a primary lock device for the motor, an electro-magnet for releasing said primary lock, and a secondary lock for said motor thrown into and held in operation by said electro-magnet when and while the same is energized.

2. The combination of a motor, a motor-driven switch, a lever, a stop normally co-acting with said lever to arrest said motor, an electro-magnet for actuating said lever to release said motor, a movable arm, and a second stop normally out of the path of said arm but adapted to co-act therewith when said arm is operated by the magnet, whereby the first named stop releases and the second stop arrests the motor when and while the magnet is energized.

3. The combination of a motor, a motor driven switch, a stop-device for normally holding said motor, an electro-magnet for opening, holding open and releasing said stop device, and a stop-controller for holding said stop-device out of action for a predetermined interval after the same is released by said magnet.

4. The combination of an automatic switch device, a detent device normally preventing said switch from acting, an electro-magnetic device for opening, holding open, and releasing said detent-device, a second detent-device thrown into operation on opening and thrown out of operation on releasing the first named detent-device, and means for preventing reengagement of said first named detent-device for a predetermined interval after being released.

5. The combination, of a snap-switch, a spring for snapping said switch, a motor for

releasing said switch to cause it to operate independent of the motor, a detent-device normally preventing said motor from operating, and electro-magnetic means for opening said detent-device to release said motor, and a second detent-device magnetically controlled for stopping and releasing the motor after the latter has been released by the first named detent-device.

6. The combination, of a snap-switch, a spring for snapping said switch, a motor for operating said switch, a detent-device for preventing said motor from operating, electro-magnetic means for opening, holding open and releasing said detent-device, a second detent-device for said motor thrown into operation on opening and out of operation on releasing said first named detent-device, and means for preventing said first named detent-device from closing after being released until said motor shall have operated for a predetermined interval.

7. The combination with a switch, of a motor for operating the same, a detent normally locking said motor against operation, an electro-magnet for opening, holding open and releasing the dog of said detent, a second detent device thrown into operation on the opening and thrown out of operation on the release of said dog, and means for preventing said dog from closing to working position until the motor shall have operated for a predetermined interval.

8. The combination with a snap switch, of a spring for snapping the same, a motor for releasing the switch to cause it to operate independent of the motor, a detent device for said motor, an electro-magnetic device for releasing said motor from said detent-device, a toothed disk operated by the motor and a projection from the detent device to co-act with said disk to permit operation of the motor for a predetermined period.

9. The combination with a snap switch, of a spring for snapping the same, a motor for releasing the switch to operate independent of the motor, a detent normally holding said motor inoperative, an electro-magnetic device for opening, holding open and releasing said detent, and a second detent for said motor thrown into operation on the opening and thrown out of operation on the release of the first named detent.

10. The combination with a snap switch, of a spring for snapping the same, a motor for releasing the switch, a detent normally holding said motor inoperative, an electro-magnetic device for opening, holding open and releasing said detent, a second detent for said motor thrown into operation on the opening and thrown out of operation on the release of the first named detent, and means for holding the first named detent open after its release by said magnetic device

until the motor shall have operated to a given extent.

11. The combination with a spring moved snap-switch, of a motor for releasing said switch to permit it to operate independently of the motor, means for locking and releasing said motor, and means permitting said motor to operate to a given extent after being released and for then arresting the motor independent of the action of the switch.

12. The combination with a spring-moved snap-switch, adapted to open and close the circuit by its consecutive movements, of a motor for releasing said switch, timing mechanism for controlling the action of said motor comprising primary and secondary lock devices alternately stopping the operation of the motor, and an electro-magnet for releasing said timing-mechanism.

13. The combination with a spring-actu-

ated snap-switch, of a spring-motor for releasing said switch, a rotary pin connected with said motor, a dog normally holding said pin, an electro-magnet for releasing said dog from said pin, a second rotary pin, and a dog therefor actuated by said magnet.

14. The combination with a spring-actuated snap-switch, of a spring-motor for releasing said switch, a rotary pin connected with said motor, a dog normally holding said pin, an electro-magnet for releasing said dog from said pin, a notched rotary disk for holding said dog in an inoperative position after said magnet releases it.

Signed at New York city, in the county of New York, and State of New York, this 18th day of February, A. D. 1909.

HARRY B. KAHN.

Witnesses:

T. F. BOURNE,

MARIE F. WAINRIGHT.