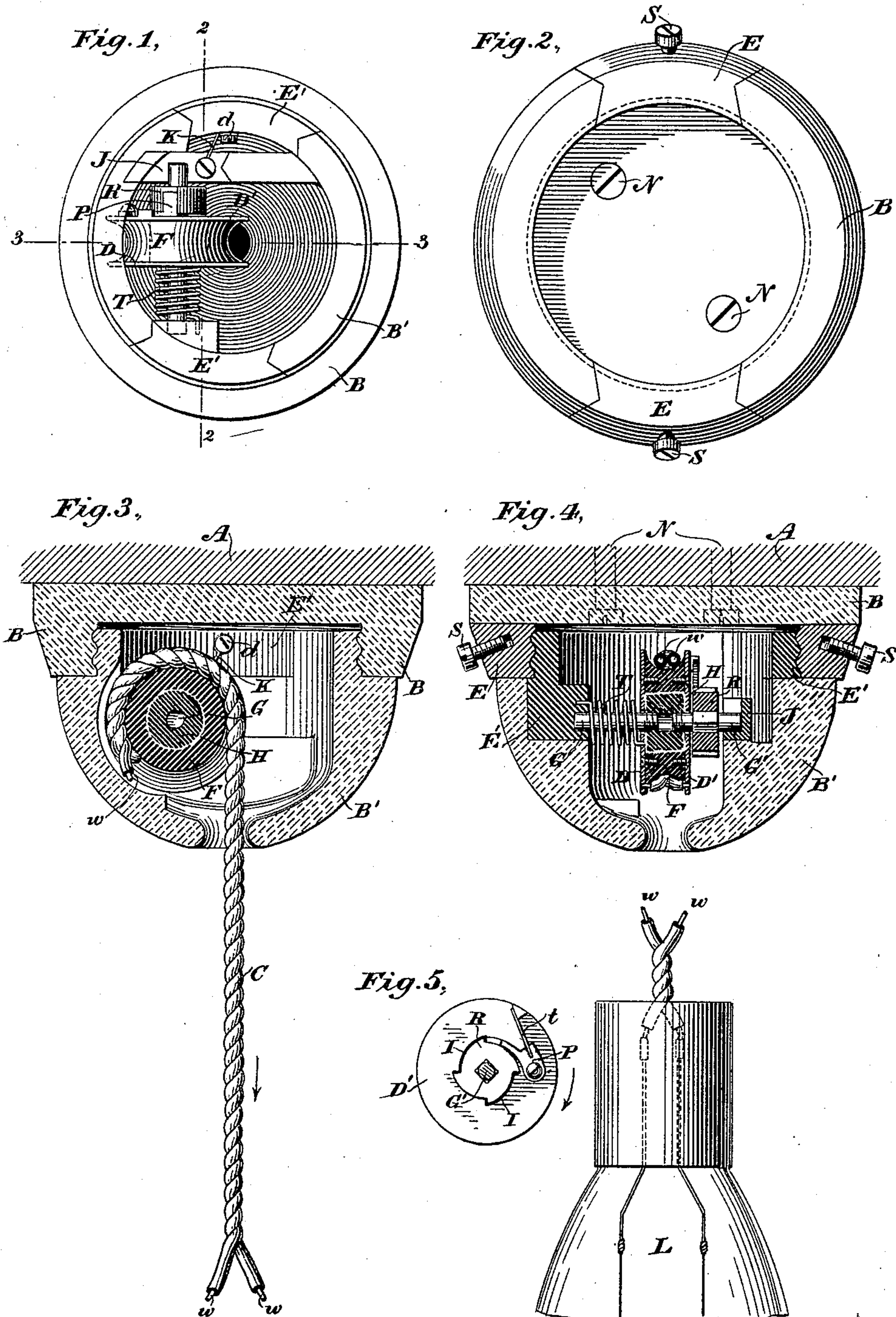


(No Model.)

E. T. GREENFIELD.
ELECTRIC LIGHT FIXTURE.

No. 459,705.

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UNITED STATES PATENT OFFICE.

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ELECTRIC-LIGHT FIXTURE.

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To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, residing at New York, county of New York, and State of New York, have made a new and useful Invention in Electric-Light Fixtures, of which the following is a specification.

My invention is directed particularly to switch devices for use in connection with electric-light and analagous electric circuits, and is designed to take the place of the ordinary well-known form of key-switch, such as is found in general use in connection with incandescent electric lamps.

My invention has for its objects, first, the giving of increased security against accidents to users in connecting and disconnecting a lamp to and from an electrical circuit; second, the avoidance of switches directly connected to and carried by the lamp proper, thereby greatly facilitating the cheapness of the construction of this type of apparatus; third, the absolute concealment of all of the parts constituting the switch and at a point inaccessible to the user under ordinary working conditions. I accomplish these several objects by the use of a pair of flexible conductors mechanically and electrically connected at their upper ends to switching mechanism and sustaining at their lower ends a lamp or analogous electric translating device, the mechanical connections being such that by pulling the lamp downward a switch is manipulated at a point from which the flexible conductors are suspended, the electrical connections being between the movable portions of the switch and the fixed portions of the device which suspends the lamp.

Prior to my invention, where incandescent lamps or similar translating devices were suspended by flexible electrical conductors twisted together and insulated from each other switching devices in the nature of keys were located in the sockets of the suspended lamps or translating devices. With such an arrangement great inconvenience arose in switching the lamps into and out of circuit by reason of the unstable nature of the suspended lamps, inasmuch as it required both hands of the user to connect and disconnect the lamps to and from circuit. In addition to this there was great liability of a damaging shock to the user,

owing to the fact that both hands were at once placed in contact with the lamp and its attachments. Both of these objectionable features are entirely overcome by the use of my improvement.

My invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a plan view of the device, showing the interior arrangement of parts. Fig. 2 is a similar plan view showing the under side of the upper portion of a ceiling-block as attached to the ceiling of a room and adapted for receiving my improved switch and connections. Fig. 3 is a vertical sectional view of the entire apparatus, taken on line 3 3, Fig. 1. Fig. 4 is a similar sectional view taken on line 2 2, Fig. 1. Fig. 5 is a detail view showing the switch apparatus proper.

Referring to the drawings in detail, A represents the ceiling of a room.

B represents the upper portion of an ordinary ceiling-block having the usual electrical connections with the indoor branches of an electric-lighting system, said block being held to the ceiling by screws N N.

E E represent the metallic portions of the ceiling-block provided with binding-screws S S for connecting the same to the branch circuits.

B' represents the lower portion of the ceiling-block, made of insulating material and provided with two metallic conducting portions E' E', which are screw-threaded and adapted to fit in the screw-threads of the corresponding metallic portions E E of the fixed portion of the ceiling-block B.

H represents a cylindrical insulating-block into which is screw-threaded a pair of journals G G', made of conducting material and journaled at their outer ends, the one G into the base of the conducting part E' and the other G' into a journal-bearing J of conducting material connected by a fusible cut-out K and screw d with the conducting part E'. (See Fig. 1.)

D and D' represent metallic or conducting disks secured by screws to the faces of the pulley F, made of insulating material and adapted to receive in its grooved surface the spiral cord C, constructed of a pair of insu-

lated conducting-wires *w w*, one of which is connected to the metallic plate D and the other to the metallic plate D'.

R represents a ratchet-wheel provided with a number of ratchet-teeth—in this instance four (4)—two of which are covered on their upper or outer surfaces with a heavy coating of insulating material, or are insulated in any preferred manner from a shaft G', to which the ratchet-wheel is firmly secured.

P represents a propelling-pawl pivotally secured to the disk D', said pawl and its connection with said disk being of conducting material.

t represents a leaf-spring adapted to force the pawl into close frictional connection with the teeth of the ratchet R, said ratchet R being of conducting material, but electrically connected with the shaft G'.

T represents a spiral spring of conducting material, firmly secured at one end to the metallic part E' and at the other to the metallic disk D. The pulley F is journaled upon the insulating cylindrical block H, and is so arranged that when the cord C is drawn downward the disk D' and hence the pawl P will move in the direction of the arrow, (see Fig. 5,) and the free end of said pawl will ultimately drop behind the next tooth of the ratchet R, so that when the cord C is released the spiral spring T, which was placed under stress by the downward pull of said cord, will cause the pulley F to rotate in a reverse direction one-quarter of a revolution, thereby placing the ratchet R in such a position that at the next downward movement of the cord the pawl will fall into the next succeeding ratchet-tooth. It will therefore be clearly understood that one downward pull of the cord C and the lamp which it carries will close the circuit from the binding-screw S through the metallic part E, the metallic part E', spiral spring T, metallic disk D, one of the conductors *w*, connected thereto through the lamp L to the other cord or conductor *w*, thence to the second disk D', thence through the pawl H to the metallic or conducting portion of the ratchet R, through the shaft G' and conducting journal-bearing J, through the fusible cut-out K, screw *d*, conducting part E', conducting part E, binding-screw S to the outer circuit, and that on releasing said cord the spiral spring T, which was put under tension, will cause the pulley F, acting through the pawl P and ratchet R, to rotate the latter through one-quarter of a revolution, so that the switch is now in position for interrupting the circuit at the next downward pull of the cord C. The switch will therefore break the circuit on the next downward pull of the cord C by reason of the fact that the metallic pawl P will rotate in the direction of the arrow (see Fig. 5) and fall into the next ratchet-space, which is covered with insulating material I, so that when the cord C is again released the pawl P, acting under stress of the spiral spring T, will rotate to the left

and carry with it the ratchet R one-quarter of a revolution, thus placing it in position for again making the circuit on the next downward pull of the cord C. It is therefore quite clear that one downward pull will cut the lamp into circuit and at the same time put the spiral spring T under stress, so that when the cord is released the switch will be put in position for cutting the lamp out on the next downward pull of the cord, and that when the cord is again released the switch will be again put in position for cutting the lamp into circuit on the next succeeding downward pull of the cord, and so on, alternately.

Without further description it will be understood that the lamp L may be of the usual pattern of incandescent lamps minus the key attachments, the conductors *w* being connected directly to the inleading wires in the neck thereof.

It is quite clear that in the use of this apparatus the attendant is not subjected to any liability of a shock, inasmuch as all of those portions of the device which are in immediate proximity of the user are carefully insulated and the switch portion of the apparatus is located at a point which under ordinary circumstances is out of reach.

I do not limit myself to the specific apparatus herein shown and described for switching an electric lamp or analogous electric translating device into or out of circuit without the agency of a key or switch connected directly to the lamp, nor to the arrangement of parts herein shown for concealing the same, as I believe I am entitled to claim, broadly, mechanism which instantly ruptures the circuit in such manner as to prevent an arc, and is actuated through the agency of conductors which suspend the lamp, and I desire it understood that my claims shall be construed to cover, broadly, the application of this generic principle; also, that it is novel with me to conceal all of the switching apparatus in an insulated ceiling-block located at a point out of access of a daily user of the lamp; nor do I limit myself to the use of the suspending conducting-cords C for controlling the operation of the pulley P, as it is obvious that any cord or chain running to said pulley might be utilized for this purpose. I am aware, however, that it is old in telephone systems to suspend a hand-telephone by a pair of insulated conductors attached to the electrodes of the telephone and wound about a spring-actuated drum provided with circuit connections for connecting the telephone to and disconnecting it from an electrical circuit, and my claims hereinafter made are not of such scope as to include such an apparatus, and are designed only to cover switching apparatus which suddenly or instantaneously ruptures the circuit in such manner as to prevent an arc, the entire arrangement being such as to insure absolute safety to the user and security against accidental fusion of the electrodes at the points of the switch where the circuit is ruptured.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A ceiling-block secured to the ceiling of a room and inclosing a switch having a pair of insulated electrical conductors mechanically and electrically connected with the operative portions of the switch and sustaining an electric lamp at their lower end, all of the conducting parts of the switch and conductors being securely insulated, substantially as described.

2. A switch inclosed in an insulating ceiling-block having a pair of flexible conductors insulated from each other, but mechanically and electrically attached to the operative portions of the switch at their upper ends and directly to the leading-in wires of a lamp sustained at their lower ends, every portion of said conductors being securely insulated, so that the switch may be operated thereby without danger of shock, substantially as described.

3. An incandescent electric lamp having a pair of flexible conductors insulated from each other and connected each directly to one of the leading-in wires of an incandescent lamp, said conductors being attached at their upper ends both electrically and mechanically to a switch inaccessible to the user, all of the electrical conducting parts of said switch being inclosed in an insulating casing or ceiling-block, substantially as described.

4. A make-and-break switch comprising a pulley and a pair of conducting-cords attached to said pulley at one end and to a translating device, as a lamp, at their other ends, in combination with circuit connections operatively connected to the pulley, and a step-by-step mechanism, the arrangement of said parts being such that one pull of the cords causes the circuit to be interrupted through the lamp and the next pull to be continued therethrough, substantially as described.

5. A switch for use with an electric lamp or an analogous electrical translating device, consisting of a movable circuit making and breaking device concealed in a ceiling-block, in combination with a pair of flexible insulated electrical conductors supporting an electric lamp at their lower ends and mechanically and electrically connected with the switch and switch connections at their upper ends, whereby the lamp may be successively cut into and out of circuit, substantially as described.

6. A switch consisting of a ratchet mechanically connected to a pulley carrying a cord and provided with a retractile spring, said ratchet having electrical connection with a lamp or other translating device and adapted to alternately connect and disconnect the lamp to and from the circuit, substantially as described.

7. An electric lamp having its leading-in wires connected to a pair of insulated conductors, which in turn are mechanically connected to a pulley and electrically connected to a switch controlled by the pulley provided with a ratchet and a spring-actuated conducting-pawl, the electrical connections being such that the lamp may be alternately cut into and out of circuit for alternate manipulations of the pulley, substantially as described.

8. A pair of electrical insulated conductors twisted to form a cord and attached both electrically and mechanically to a pulley having a retractile spring and a ratchet switch mechanism, whereby the conductors may be successively cut into and out of circuit at successive pulls, substantially as described.

9. In a switch, the combination of the following elements: a pair of insulated conductors constituting a cord, a pulley having conducting and non-conducting parts, the conducting parts being electrically connected one to each conductor and the non-conducting parts supporting the cord, a spiral conducting-spring attached to one of the conducting parts of the pulley and to the conducting portion of a ceiling-block, a ratchet having alternate non-conducting and conducting parts, the latter being electrically connected to a second portion of the ceiling-block, and a conducting-pawl carried by the pulley and electrically connected to one of the conducting parts thereof, substantially as described.

10. A two-part ceiling-block, one fixed and the other removable, and both provided with conducting parts, in combination with an electrical switch consisting of a pulley, a ratchet, a circuit-breaking pawl, a retractile spring, and a pair of insulated electrical conductors carried by the pulley and electrically connected to the switch, the ceiling-blocks, and a translating device, substantially as described.

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