(No Model.) 4 Sheets—Sheet 1.

H. A. SEYMOUR.

THERMOSTATIC CUT-OUT FOR ELECTRIC LIGHTING SYSTEMS.

No. 261,265. Patented July 18, 1882.

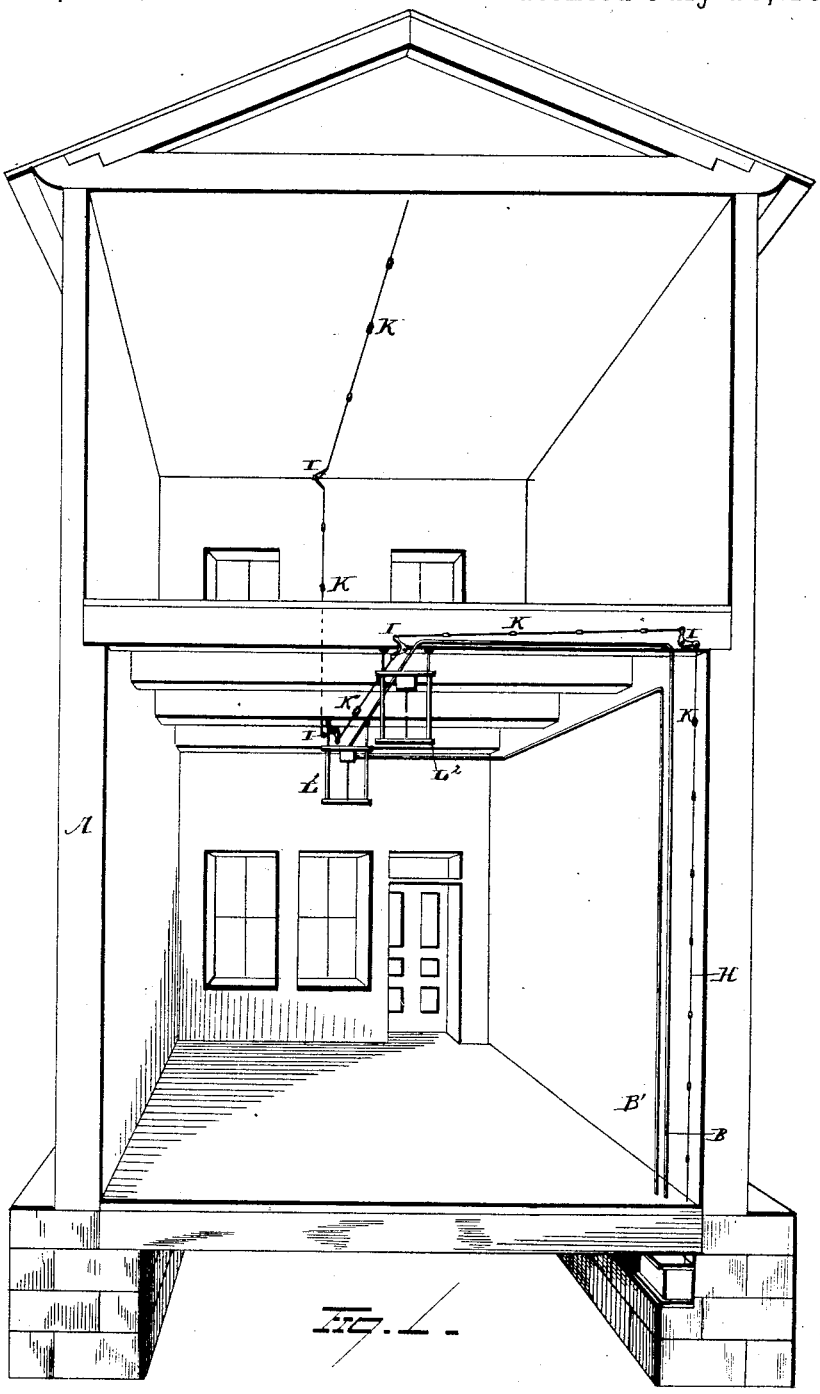

Fig. 1.

WITNESSES:
E. L. Nottingham.
Geo. D. Seymour.

INVENTOR
Henry A. Seymour

(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

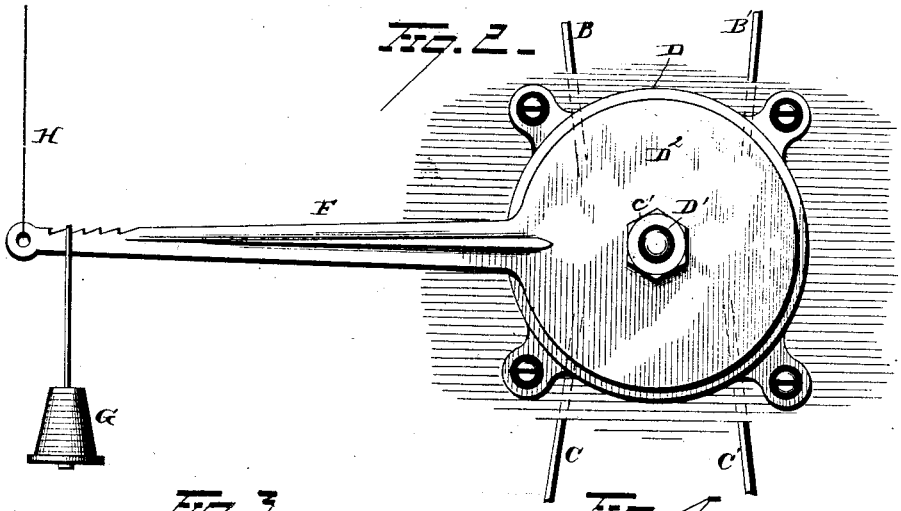


Fig. 3.

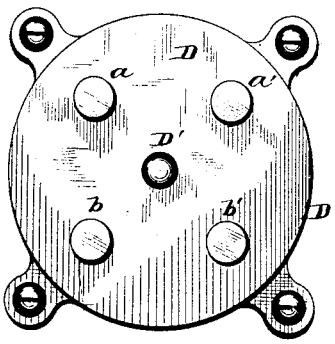


Fig. 4.

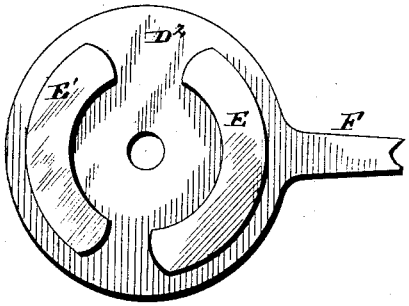


Fig. 5.

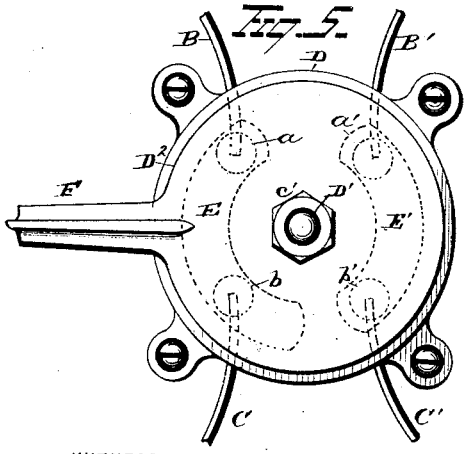
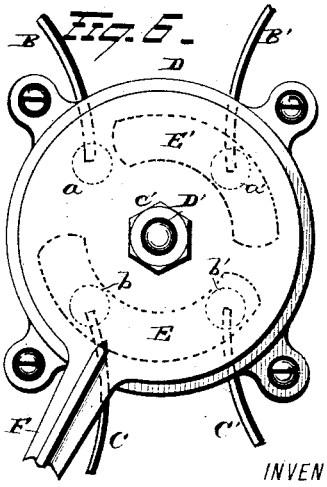


Fig. 6.



WITNESSES

E. L. Nottingham

Geo. D. Seymour.

INVENTOR

Henry A. Seymour.

(No Model.) 4 Sheets—Sheet 3.

H. A. SEYMOUR.

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Fig. 7.

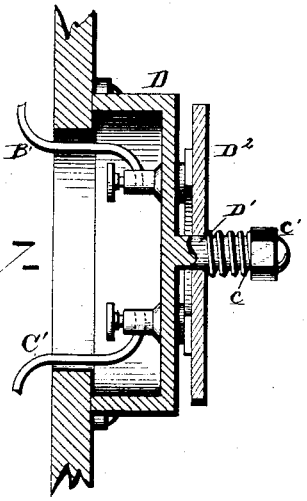

Fig. 8.

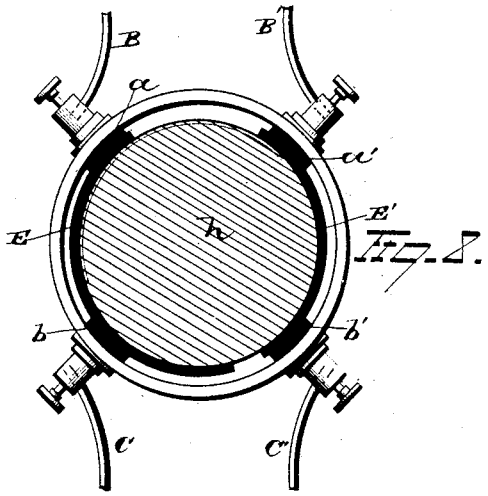

Fig. 9.

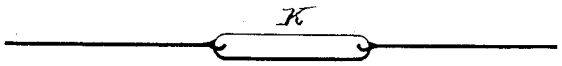

Fig. 10.

WITNESSES

E. C. Nottingham

Geo. O. Seymour

INVENTOR

Henry A. Seymour.

(No Model.) 4 Sheets—Sheet 4.

H. A. SEYMOUR.

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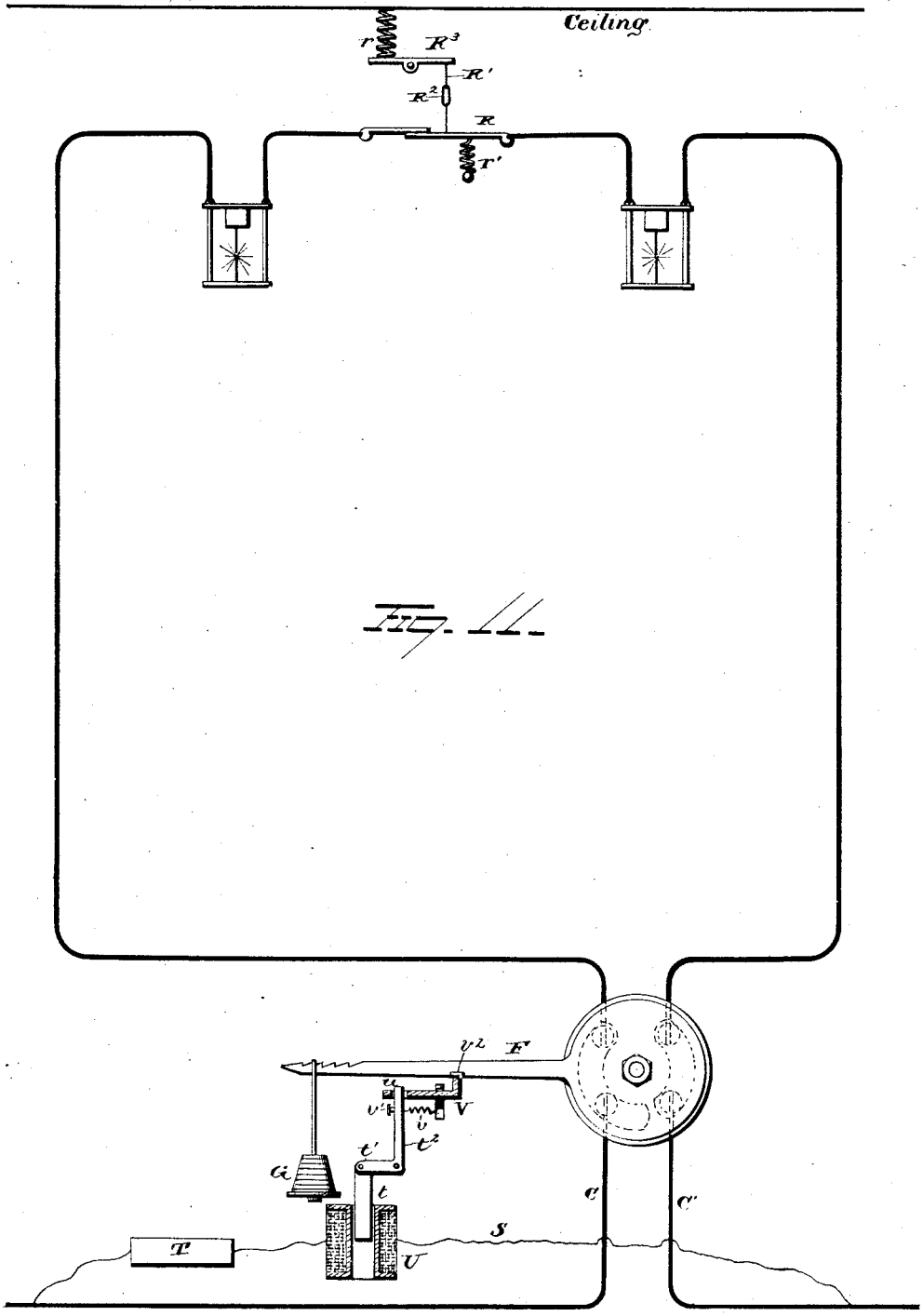

Fig. 1.

WITNESSES

E. C. Nottingham.

Geo. D. Seymour.

INVENTOR

Henry A. Seymour.

UNITED STATES PATENT OFFICE.

HENRY A. SEYMOUR, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO GEORGE W. STOCKLY, OF CLEVELAND, OHIO.

THERMOSTATIC CUT-OUT FOR ELECTRIC LIGHTING SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 261,265, dated July 18, 1882.

Application filed January 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. SEYMOUR, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Thermostatic Cut-Outs for Electric Lighting Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

One of the most serious objections urged against the adoption of the electric light, both by the users and the owners and insurers of buildings in which it is desired to locate such lights, is the increased danger of loss by fire, owing to the great reluctance of firemen to enter and work in a burning building provided with electric lights. The apprehended and real danger is that a fatal electric shock might be received from the terminals of the wires, or from one grounded wire, should the conductor in the building become broken from any cause.

The object of my invention is to obviate all danger from the causes specified by providing a switch and suitable devices to be actuated by heat of a fire originating in any part of a building provided with electric lights, whereby the electric current will be automatically cut off from the conductors leading through the building in case of fire, and thereby enable the firemen to work in the burning building with absolute safety, so far as the electric current is concerned.

With these ends in view my invention consists essentially, in combination with the main circuit of an electric lighting system, of a switch and suitable devices, constructed and arranged subtantially as hereinafter described, and adapted to be operated by heat and automatically cut out of circuit the electric conductors extending through a building when the temperature therein exceeds a predetermined degree.

My invention further consists, in combination with the main circuit of an electric lighting system, of a switch and suitable devices, constructed and arranged substantially as hereinafter described, and adapted to automatically cut out of circuit the electric conductors extending through a building when the temperature therein exceeds a predetermined degree and short-circuit the currents through the main conductor.

My invention further consists in certain features of construction and combinations of parts, as will be hereinafter explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of a building provided with one form of my improvement. Fig. 2 is a view in side elevation of one form of switch. Fig. 3 is a plan view of the stationary portion of the switch. Fig. 4 is a similar view of the oscillating disk of the switch. Fig. 5 represents the switch, showing the contact-plates in position for conducting the current through the conductors of the building. Fig. 6 is a similar view, showing contact-plates in their position when the switch is operated to cut off the current from the conductors in the building and short-circuit the current through the main conductor. Fig. 7 is a view in vertical section of the switch. Fig. 8 is a transverse section of another form of switch. Fig. 9 shows one form of fusible connections. Fig. 10 represents another form of fusible connections, and Fig. 11 represents a modification.

A represents a building, and B B′ the two ends of the electric conductor of an electric-light circuit within the building. The ends of the conductor are located at any desired point. They may lead to a closed switch box or casing placed on the outside of the building near the sidewalk, or they may extend down to a switch-box located in the basement of the building or on the first floor near the front, the switch being arranged so that it may be operated by a key from the outside or inside. The switch may be placed in an iron casing, or one made of masonry or any fire-proof material. The end B is electrically connected with the stud or plate *a* of the switch-board D and the other end, B′, with the stud or plate *a′*. One end, C, of the main conductor, through which the electric current is supplied to the circuit in the building, is electrically connected with the stud or plate *b* and the other end, C′, with the stud or plate *b′* of the switch-board.

The portion D of the switch-board is provided with a pin, D′, on which is journaled the movable part D^2, the latter being retained in close contact with the part D by means of a spiral spring, *c*, the tension of which may be regulated by the nut *c′*. The movable portion D^2 of the switch is provided with the conducting-plates E E′. When the current is being conducted through the circuit in the building the parts of the switch will be in the position illustrated in Fig. 5. The current flows from the end C of the main conductor through the stud *b*, plate E, stud *a*, building-circuit B B′, back through stud *a′*, plate E′, stud *b′*, and to the other end, C′, of the main conductor.

I will now proceed to describe one arrangement of devices for automatically operating the switch in case of fire in the building.

The movable portion D^2 of the switch is provided with an arm, F, from the outer end of which is suspended a weight, G. A comparatively-fine wire, H, is secured to the end of the arm F of the switch-lever. This wire may extend over every ceiling of the building, as illustrated in the drawings. At the bends I provide bell-crank levers I to enable the wire H to work freely, as will be explained. The wire H is cut into any number of sections, which are united by a metal alloy fusible at a low temperature. These connections may be made of strips K of metal, fusible at a low temperature, as represented in Fig. 9, or they may be connected by metal strips L L′, united by fusible solder *l*, as represented in Fig. 10. The fusible alloy may be made to fuse at any degree of heat, but is preferably made to fuse at from 110° to 150° Fahrenheit. After the wire H, with its fusible connections, has been arranged throughout the building it is drawn taut to uphold the switch-lever and weight and the end of the wire is securely fastened. Under the ordinary working of the system the switch will be in the position illustrated in Figs. 2 and 5, causing the current to pass through the circuit in the building and operate the lamps L^2. Should a fire originate in any room of the building, the fusible connection therein will be melted, allowing the wire H to part and the weight G to drop and shift the switch to the position illustrated in Fig. 6, thereby completely cutting out of circuit the conductor extending through the building, and causing the current to flow from the end C of the main conductor to the stud *b*, across plate E to the stud *b′*, and thence to the other end, C′, of the main conductor. Thus it will be observed that the conductor in the building is automatically cut out of circuit while the current flows uninterruptedly through the main conductor.

Instead of employing the form of switch described, the switch may be constructed as represented in Fig. 8, wherein *h* is a plug of non-conducting material, and is provided with a crank-arm, (not shown,) to which the weight and wire are attached. The plug is provided with the metal plates E E′, so that the current flows from the end C of the main line through the contact-plate *b*, plate E, plate *a*, to end B of the building-circuit, and back through B′, plate *a′*, plate E′, plate *b′*, to the other end, C′, of the main conductor. By turning the plug the current will be cut off from the building-circuit and be caused to flow from the end C of the main conductor through plate *b*, plate E, plate *b′*, to the other end, C′, of the main conductor. Again, the ordinary form of switch-plug may be employed and a lever arranged so as to withdraw the plug in case of fire. As various forms and constructions of switch might be employed for the purpose in view, I do not restrict myself to the employment of any particular construction of switch mechanism.

In the foregoing I have described one arrangement of parts whereby the switch is actuated mechanically. This system has an advantage in that it will operate at all times, the presence or absence of the electric current being immaterial to its operation.

I will now proceed to describe one arrangement of parts for operating the switch by the current.

In Fig. 11 is represented the lighting-circuit extending through the building. This circuit is broken at any desired number of points and closed by a lever, R, which latter is retained in its closed position by a wire, R′, provided with a fusible-alloy connection, R^2, one end of the wire being attached to the lever R and the other end to a lever, R^3, the opposite end of which is depressed by a spring, *r*. In case of a fire, the fusible connection R^2 will melt, allowing the spring *r′* to pull down the lever R, and thus open the lighting-circuit. The two ends C C′ of the main conductor are connected to a switch of the construction hereinbefore described.

S is a shunt-circuit connecting the two ends C C′ of the main conductor around the switch, and provided with a resistance, T, which is greater than the resistance of all the lamps on the circuit within the building. A solenoid, U, is placed in the shunt-circuit, the movable core *t* of which is pivoted to the arm *t′* of a bell-crank lever. The other arm, t^2, of the bell-crank lever extends through a slot, *u*, in a sliding bolt, V, which latter extends beneath a lug, v^2, on the switch-lever and retains it in its raised position. The core *t* is upheld by the spring *v*, the tension of which is regulated by the screw *v′*. A fire originating in the building melts the fusible connection and breaks the circuit, thereby causing the current to be diverted through the shunt and energize the solenoid and pull the core down, which in turn retracts the sliding bolt and allows the switch-lever to fall and cut off the current from the circuit in the building and cause it to pass directly from one end, C, of the main conductor through the switch to the other end, C′, of the main conductor. Instead of this plan, a fine wire may extend throughout the

building and a current of electricity be supplied thereto from a local battery, and by means of fusible connections and suitable devices the switch may be operated either by opening or closing this separate circuit.

If the switch is to be operated by breaking the circuit, fusible connections will be employed, and if by closing the circuit any thermostat suitable for this purpose may be used. Where the generator is located in the same building as the lights the current from the generator may be cut off in the manner described, which would in effect short-circuit the current; or the circuit may simply be opened near the generator.

In buildings already provided with an automatic fire-extinguishing system operated by fusible connections the switch lever may be connected with the lever of the water-regulating valve, so that in the event of a fire the water is automatically turned onto the system of distributing-nozzles, and at the same instant the electric current is automatically cut off from the lighting-circuit extending throughout the building. Instead of using weight for turning the switch, a spring might be used for such purpose.

It is evident that many changes in the construction and arrangement of the various parts of the system might be resorted to without involving a departure from the spirit of my invention; and hence I would have it understood that I do not restrict myself to the arrangement and construction of parts shown and described.

So far as I am aware, this is the first improvement yet devised in a system of electric lighting for automatically cutting out of circuit the electric conductor of a building in case of fire; and hence I make broad claim to such to such a system.

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

1. The combination, with the main circuit of an electric lighting system, of a switch and suitable devices constructed and arranged to automatically cut out of circuit the electric conductors extending through a building when the temperature therein exceeds a predetermined degree and short-circuit the current through the main conductor, substantially as set forth.

2. The combination, with the main conductor of an electric lighting system and a switch constructed and arranged to electrically connect the main conductor with the electric conductor of a building, and, when shifted, to cut out of circuit the conductor of the building and divert the current through the main conductor, of means, substantially as described, located within the building provided with the conductor, and adapted to be actuated by abnormal heat in the building and automatically shift the switch and short-circuit the current, substantially as set forth.

3. The combination, with the main conductor of an electric lighting system and a switch constructed and arranged to electrically connect the main conductor with the electric conductor of a building, and, when shifted, to cut out of circuit the conductor of the building and divert the current through the main conductor, of fusible links or connections located in different parts of the building, and means, substantially as described, for shifting the switch upon the fusing of any one of said links, thereby cutting the conductor of the building out of circuit and diverting the current through the main conductor, substantially as set forth.

4. The combination, with the main conductor of an electric lighting system and a switch constructed and arranged to electrically connect the main conductor with the electric conductor of a building, and, when shifted, to cut out of circuit the conductor of the building and short-circuit the current through the main conductor, of a wire connected with the switch-lever and extending through the building and connected or joined at intervals by fusible joints or links, and a weight or its equivalent for shifting the switch and short-circuiting the current when the safety-wire is parted, substantially as set forth.

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

HENRY A. SEYMOUR.

Witnesses:
HERMAN MORAN,
F. O. MCCLEARY.