No. 621,860. Patented Mar. 28, 1899.

J. SHORK.

LOOPING-IN SWITCH.

(Application filed Mar. 28, 1898.)

(No Model.) 2 Sheets—Sheet 1.

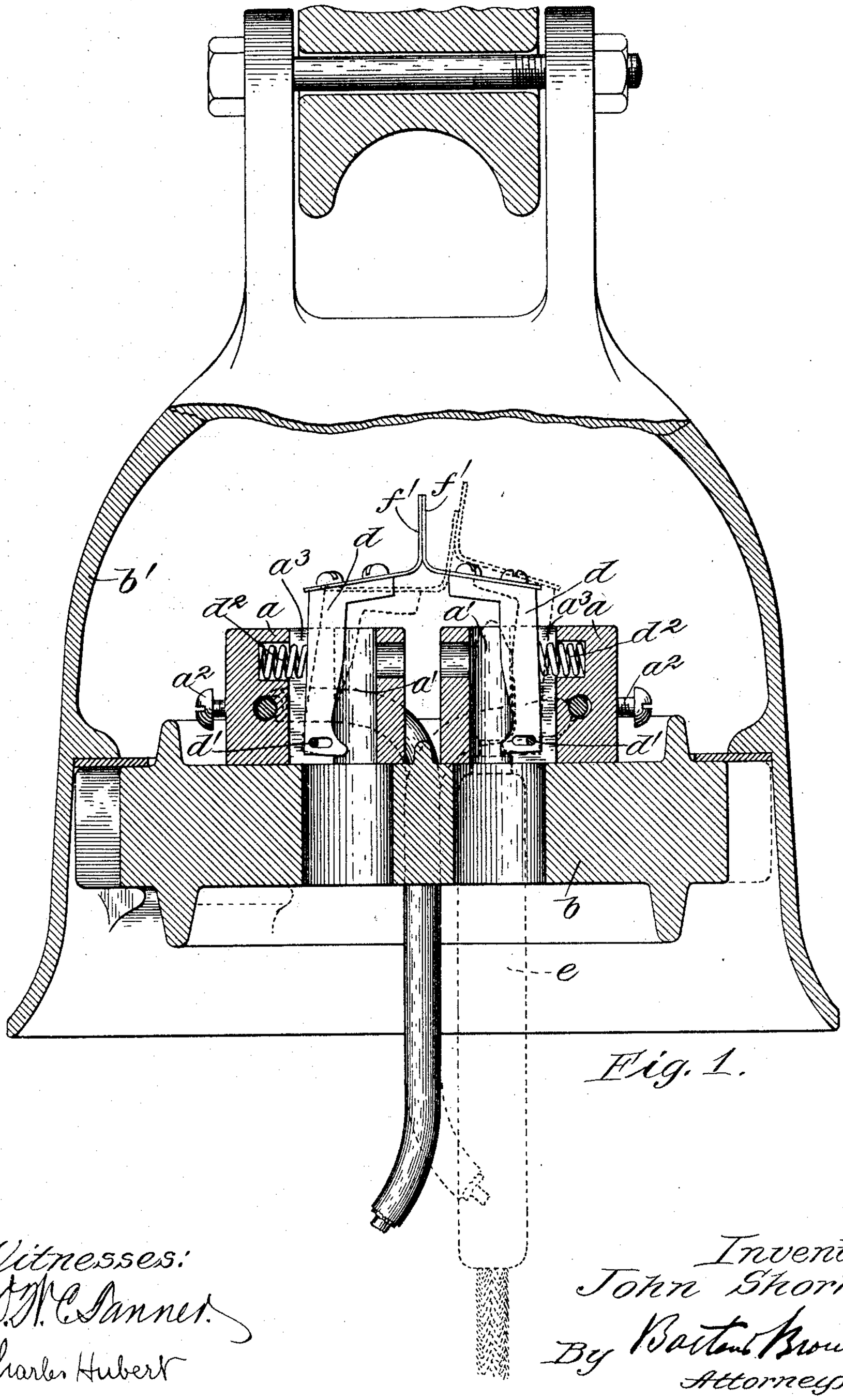

Fig. 1.

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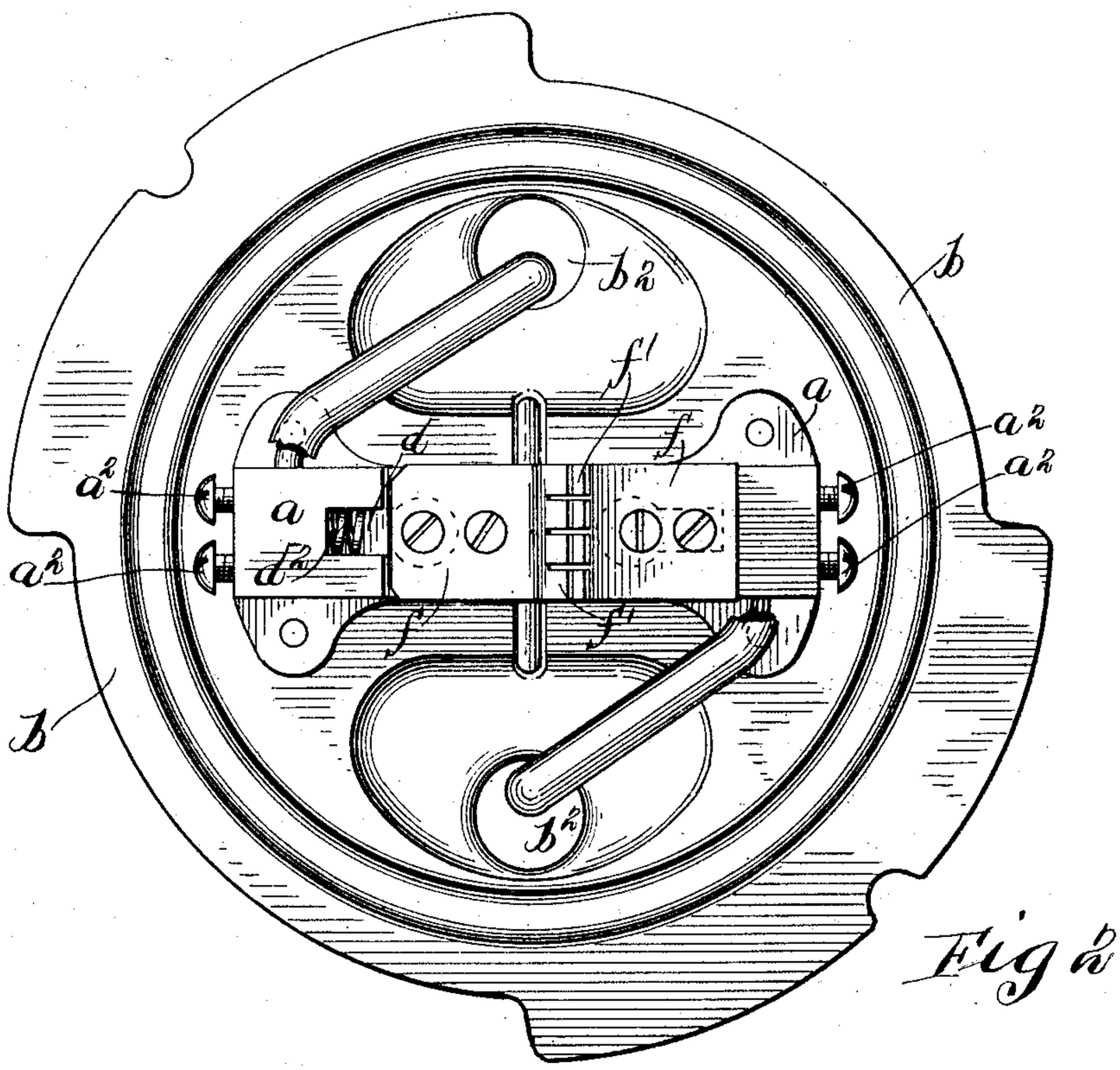

Fig 2

Fig 3

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UNITED STATES PATENT OFFICE.

JOHN SHORK, OF DETROIT, MICHIGAN, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

LOOPING-IN SWITCH.

SPECIFICATION forming part of Letters Patent No. 621,860, dated March 28, 1899.

Application filed March 28, 1898. Serial No. 675,375. (No model.)

To all whom it may concern:

Be it known that I, JOHN SHORK, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a certain new and useful Improvement in Looping-In Switches, (Case No. 1,) of which the following is a full, clear, concise, and exact description.

My invention relates to looping-in switches for electric circuits; and its object is to provide a simple switch whereby apparatus may be included in series in a circuit without interrupting the same. Such a switch is especially desirable for use in connection with electric-arc-lamp circuits, since it is a common practice to connect these lamps in series, and when it is desired to cut lamps in and out of circuit this must be done without interrupting the continuity thereof, and thus interfering with the remaining lamps on the circuit.

In accordance with my invention I provide a pair of plugs constituting the terminals of the branch circuit which it is desired to loop into the main circuit and which branch circuit may contain, for instance, an electric-arc lamp. Sockets into which said plugs are adapted to fit are provided in connection with the main-circuit terminals, switching mechanism associated with said plug-sockets being adapted to maintain a short circuit between said main-circuit terminals at all times, except when both plugs are inserted within their respective sockets, connection being established with the branch circuit of which the plugs are terminals before the short circuit across said terminals is broken by said switching mechanism. The main circuit, in which said plug-sockets are located, is thus maintained continuous, since when the plugs are inserted the path for the current lies through the branch circuit, and when one or both of the plugs are withdrawn a short circuit is automatically established between said switch-sockets before the plugs are electrically disconnected therefrom.

I will explain my invention more in detail by reference to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a looping-in switch embodying my invention, a convenient mounting for the same being illustrated in connection therewith. Fig. 2 is a plan view of the switching mechanism shown in Fig. 1; and Fig. 3 is a sectional view on line 3 3 of Fig. 2, showing one plug completely inserted in its socket, the other plug being shown as in the act of insertion.

Like letters of reference are used to designate like parts in all the figures.

The circuit-terminals a a, in which the plug-sockets a' a' are provided, are mounted upon an insulating-base b, such as porcelain or the like, such base preferably being secured within and protected by a metallic hood b'. Binding-screws a^2 a^2 are provided upon the main-circuit terminals a a, and the feeders of the main circuit may be led within the interior of the hood b' through holes b^2 b^2, provided in the base b, said feeders being thereupon secured to the terminals a a by means of such binding-screws, as illustrated. Contact-levers d d are pivoted within recesses a^3 a^3, provided in said circuit-terminals a a, by pins d' d', said contact-levers, impelled by springs d^2 d^2, being adapted to engage with the contact-terminals e' e' of plugs e e when such plugs are inserted in the sockets and make firm electrical contact therewith. Slots d^3 d^3 are provided in each of the contact-levers d d, through which slots the pivot-pins d' d' are passed, this construction permitting a somewhat free movement of the contact-levers in order to accommodate themselves to the easy insertion of the plugs and to the required manipulation of said contact-levers by said plugs. Extensions f f are provided upon the contact-levers d d, said extensions being provided with contact-springs f' f', which are adapted to engage with each other when the contact-levers occupy certain positions, circuit being thus maintained from one main-circuit terminal a to the other through the extensions f f and contact-springs f' f'.

Referring to Fig. 1, it will be seen that when the plugs are withdrawn from their sockets circuit will be maintained, as above described, across the terminals a a through the spring-actuated contact-levers and contacts f' f', mounted upon the extensions thereof. Sup-

posing now plug *e* of the pair to be inserted in one of the plug-sockets, as illustrated in dotted lines in Fig. 1, the position of the contact-lever *d* of the socket in which such plug is inserted will be altered, the contact-lever accommodating itself to the plug. The circuit across the main terminals, however, will still be maintained through the spring-contacts *f' f'*, since the contact *f'*, carried by the contact-lever of the other plug-socket, will be forced by the spring d^2 of such socket to follow the movement of and maintain contact with the spring-contact *f'*, carried by the contact-lever which is engaged by the plug. It will be seen that this short circuit across the main terminals will be maintained whether either one of the plugs is inserted in its socket or not.

Considering now Fig. 3, it will be observed that the right-hand plug is shown as entirely inserted in its socket and the left-hand plug is shown in the act of insertion, circuit being maintained across the main terminals until the second plug is well within its socket and perfect contact made between such plug and socket. Upon complete insertion of the second plug the contact-springs *f' f'* are separated and circuit therethrough broken, the current, however, finding path through the branch circuit of which the plugs are terminals.

It will be understood that upon the removal of either or both of the plugs circuit through such plugs will not be broken until the short circuit is completely established by way of the contact-springs *f' f'*, carried by the contact-levers *d d*.

Those skilled in the art may readily suggest changes in the construction of the device of my invention as illustrated in the drawings, and I do not wish to be understood as limiting myself to the exact form or arrangement of the parts as therein shown; but,

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

1. The combination with a pair of plug-sockets forming main-circuit terminals, of means for normally maintaining said plug-sockets or terminals in electrical connection with each other, a pair of separate connecting-plugs, adapted for insertion one after another in the respective plug-sockets, said plugs constituting the terminals of a branch circuit, and means, actuated by the plug last inserted, for automatically breaking the electrical connection between said main-circuit terminals, thereby including said branch circuit between said main-circuit terminals, substantially as described.

2. The combination with a pair of plug-sockets forming main-circuit terminals, of pivoted contact-levers associated one with each plug-socket, means for maintaining said levers normally in contact with each other, a pair of separate connecting-plugs forming the terminals of a branch circuit and adapted for insertion one after the other each in its respective socket, and means, actuated upon the insertion of the second plug of the pair, for automatically separating the contact-levers from one another, whereby electrical connection between said main-circuit terminals is completed only through said branch circuit, substantially as set forth.

3. The combination with a pair of plug-sockets forming main-circuit terminals, of contact-pieces associated one with each plug-socket, means for normally maintaining said contact-pieces in electrical connection with one another, a connecting-plug forming one terminal of a branch circuit and adapted for insertion in one of said plug-sockets, said plug when inserted being adapted to move the contact-piece of such socket away from its normal position, thereby tending to break the electrical connection between such contact-piece and its mate, means for automatically moving the other contact-lever to maintain such electrical connection, and means, actuated by the insertion of the remaining plug, for automatically breaking such electrical connection, substantially as set forth.

4. In a looping-in switch, the combination with plug-sockets forming the main-circuit terminals, of connecting-plugs forming the terminals of a branch or loop circuit, contact-levers associated with said plug-sockets and adapted to be engaged by the plugs upon insertion of the same, slots d^3 d^3 in said contact-levers, pivot-pins passing through said slots, contact portions *f' f'* carried by said levers, and springs d^2 d^2 adapted to force said contact-levers together to establish an electrical connection between them through said contact portions *f' f'*, unless both of said plugs are inserted in their respective sockets and connection thus completely established between said main and branch circuits, substantially as described.

In witness whereof I hereunto subscribe my name this 7th day of March, A. D. 1898.

JOHN SHORK.

Witnesses:
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