

(No Model.)

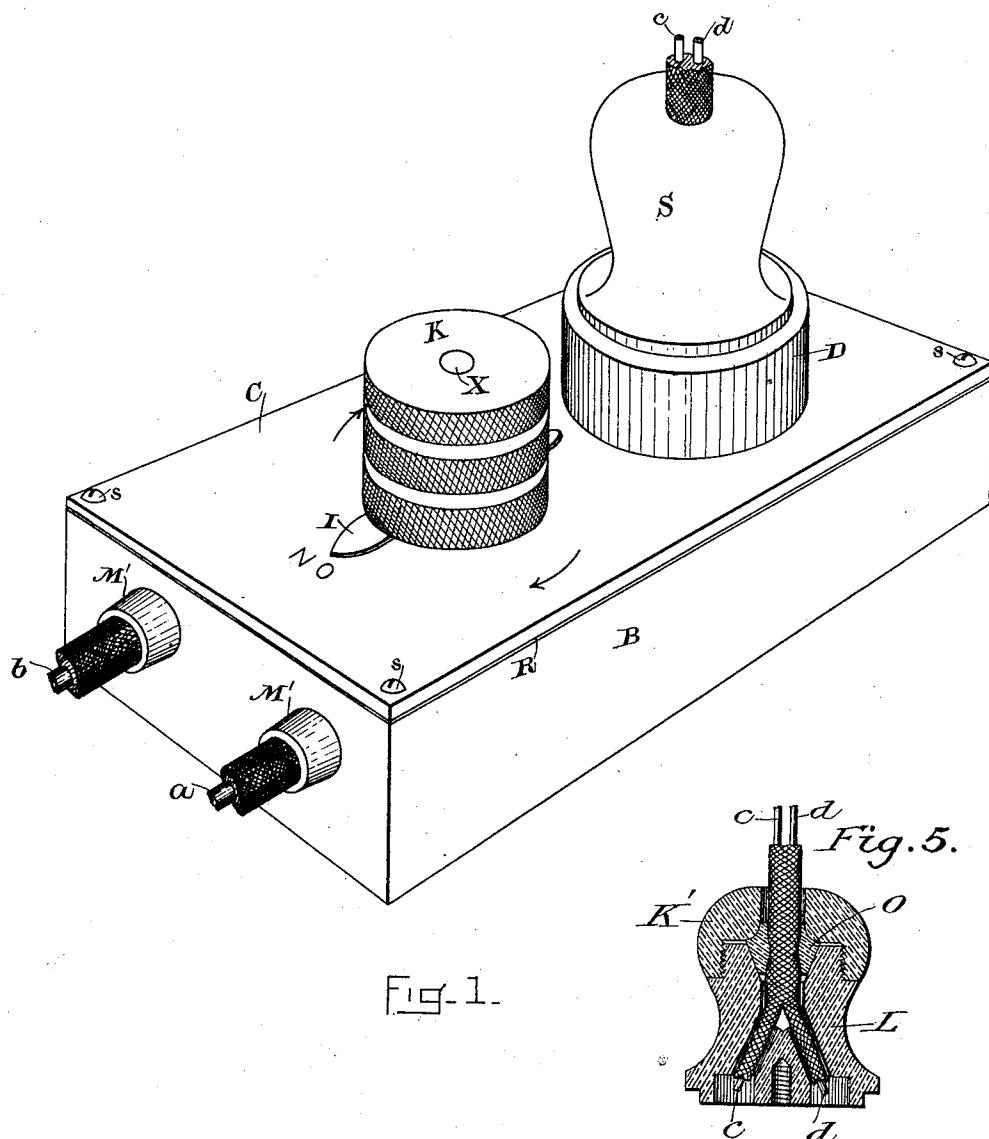
2 Sheets—Sheet 1.

A. L. ROHRER.

COMBINED SWITCH AND SWITCH BOX.

No. 468,474.

Patented Feb. 9, 1892.



WITNESSES.

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John Whibbey

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Albert L. Rohrer
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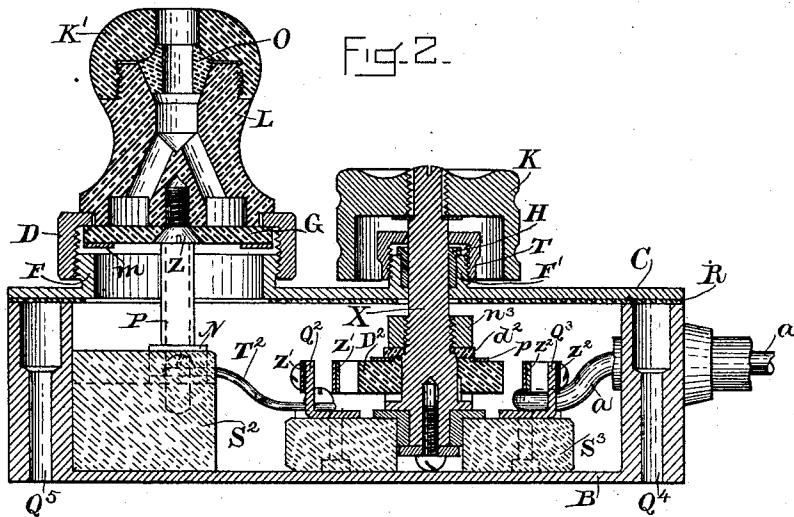


Fig. 3.

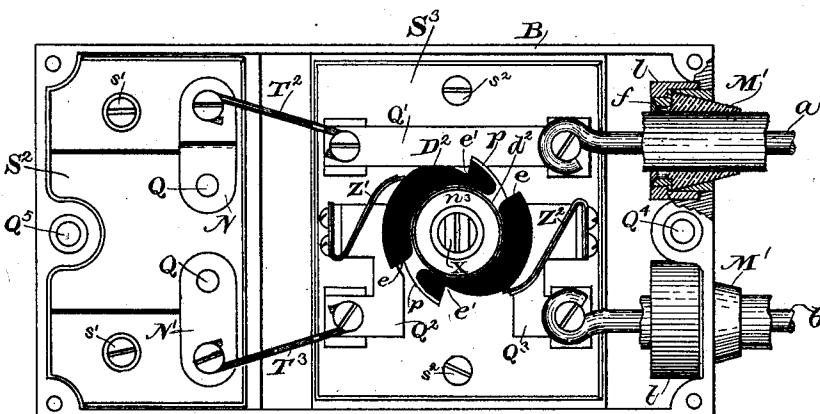
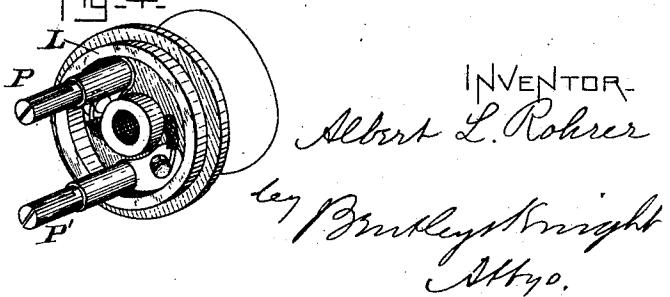


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALBERT L. ROHRER, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

COMBINED SWITCH AND SWITCH-BOX.

SPECIFICATION forming part of Letters Patent No. 468,474, dated February 9, 1892.

Application filed December 2, 1890. Serial No. 373,332. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. ROHRER, a citizen of the United States, residing at Lynn, county of Essex, and State of Massachusetts, have invented a certain new and useful Improvement in a Combined Switch and Switch-Box, of which the following is a specification.

The primary object of my present invention is to secure a box or casing for an electric switch mechanism, fuses, circuit-terminals, &c., which shall be as near as possible water-tight and yet allow the switch to be operated freely from the exterior of the box. I therefore make use of a box closed by a cover fitted water-tight, and the actuating part of the switch, together with the necessary circuit-wires leading to the translating devices and from the feeding-mains, pass into the box through specially-constructed joints, which are designed to prevent the entrance of water.

The invention further consists in certain details of construction, such as improvements in the switch itself, and the relative arrangement of the parts.

In the accompanying drawings, illustrating my invention, Figure 1 is a perspective view of the complete box ready for use. Fig. 2 is a sectional view taken through the center of the box and showing, principally, the means for rendering it impervious to water. Fig. 3 is a plan view of the box with cover removed and detail parts in section, and Figs. 4 and 5 are detail views of the socket by which the electrical connection with the working circuit is maintained.

In the views, B represents a box, of metal, such as brass or iron, open at the top and provided at one end with small openings admitting the entering circuit-wires a b. A metal cover or lid C is held down upon the box by screws s, and to make the joint between the cover and box as nearly water-tight as possible there is interposed a piece R of rubber or other elastic water-repellent material, which when compressed forms a hermetic seal between the lid and box.

K is a handle for throwing the switch from the outside of the box, and S is a socket of special construction, hereinafter described, serving as a connector between the box-terminals and working-circuit wires.

Referring now to Fig. 2, the socket S is shown made in two parts K' L, of hard rubber or other like material possessing sufficient strength and insulating qualities, which are adapted to be screwed together. Through the socket is an opening for receiving the circuit-wires c d, and between the parts K' and L is a wedge-shaped recess, in which fits a soft-rubber washer O. When the parts of the socket are screwed together, this washer is compressed around the circuit-wires, as shown in Fig. 5, and thus makes a perfectly water-tight joint. The socket is attached to the cover of the box by a metal nut D, which screws down over a boss F, rising from the cover. A flange upon the upper side of the nut fits closely into an annular recess cut in the hard-rubber piece L, and under the flange is placed a hard-rubber cap G, fastened to L by a screw Z. Hence by simply screwing up the nut D the socket is drawn firmly down upon the boss F, and here again a washer of soft rubber m will usually be interposed to guard against any possible leakage into the box. The wires c d, leading to the lamps or other working resistance, divide at about the middle of the socket and pass down the two diverging ways therein to the terminals, connected with contact-posts P P', as shown clearly in Fig. 4. When the socket is in position, these contact-posts enter holes Q Q in the box-terminals N N', which, as seen in Fig. 3, are fastened to an insulating-block S²—as, for example, slate or porcelain—which is in turn secured by screws 85 to the box at s'. Soft-rubber sleeves surround the posts between terminals N N' and cap G. A second piece of similar insulating material S³ is fixed in the inside of the box by screws s², and upon this are fastened fuse-terminals 90 and a switch mechanism constructed as follows: Three pieces of brass Q' Q² Q³ are screwed to the insulating-block S³, and to two of these Q² Q³ are attached spring-contacts Z' Z², which bear with considerable pressure against 95 the working faces of an insulating cam-shaped disk D², preferably of hard rubber. The disk is mounted upon a spindle X, extending out through the cover of the box and operated by a handle K. It is notched at e e, and from these points the spring-contacts snap, in a manner well known, into engagement with a

metal piece p , extending across the disk and designed to complete the circuit from one contact to the other. A second set of notches $e' e'$ serve to insure a quick rupturing of the circuit in the same manner. The metal piece p is held down upon the disk by a washer d^2 and nut n^3 , both of which are seen in Fig. 2.

To make a tight joint where the spindle X passes through the box, there is provided a brass bushing H , held down by a nut T , which screws down over a second boss F' on the cover. The knob K screws upon the upper end of the spindle and can be made to turn back thereon, if desired. The entering wires $a b$ are sealed into the box by a joint somewhat similar to that already described in connection with the wires $c d$. The metal of the box where the wires pass through is thickened and tapered inwardly, and a conical-shaped rubber bushing M' , surrounding each wire, fits the opening in the box, and is compressed therein by a nut l , working against a collar f , which in turn bears upon the washer M' and forces it into the wedge opening left in the box. The path of the current may be traced from a through plate Q' , fuse T^2 , terminal N , contact-post P , the working circuit, post P' , terminal N' , fuse T^3 , plate Q^3 , the switch-contacts, and out at b . It will thus be seen that a perfectly water-tight box is provided for containing the switch, fuses, circuit-terminals, &c., the parts of which can be quickly removed—as, for instance, for the insertion of new fuses or making of connections. It has been designed especially with reference to use upon shipboard. The box is fastened to the deck of the vessel or in any other position by screws passing through holes $Q^4 Q^5$ in the box, which are closed when the lid is put in place, thus preventing rusting of the

screws. An indicator I , Fig. 1, outside of the box shows the position of the switch, and as the wearing-surfaces on the conducting-plate p are comparatively short as compared with the insulating-faces of the disk the position of the indicator will tell accurately the condition of the circuit.

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

1. The combination of a switch-box, the switch-contacts inclosed therein, but actuated by a handle outside the box, a cover secured to the box, elastic water-repellent sealing material interposed between the cover and box, and elastic bushings sealing the circuit-wires and switch-handle where they enter the box, as set forth.

2. The combination of the box, terminals therein, a socket carrying terminals engaging with aforesaid terminals, and a clamping-nut engaging by annular flanges and screw-joint connections with the socket and cover.

3. A socket provided with terminals and circuit-wires and made in two or more parts inclosing a washer compressed around the circuit-wires to form a tight joint when the parts of the socket are put together, for the purpose set forth.

4. The combination of the closed box containing an electric switch with an electric wire leading thereinto, a cone-shaped elastic bushing, and a nut pressing the bushing into the joint between the wire and box, as set forth.

In testimony whereof I have hereto set my hand this 28th day of November, 1890.

ALBERT L. ROHRER.

Witnesses:

JOHN W. GIBBONEY,
JOHN T. BRODERICK.