

W. F. BOSSERT.
COMBINATION FUSE BOX.

No. 489,364.

Patented Jan. 3, 1893.

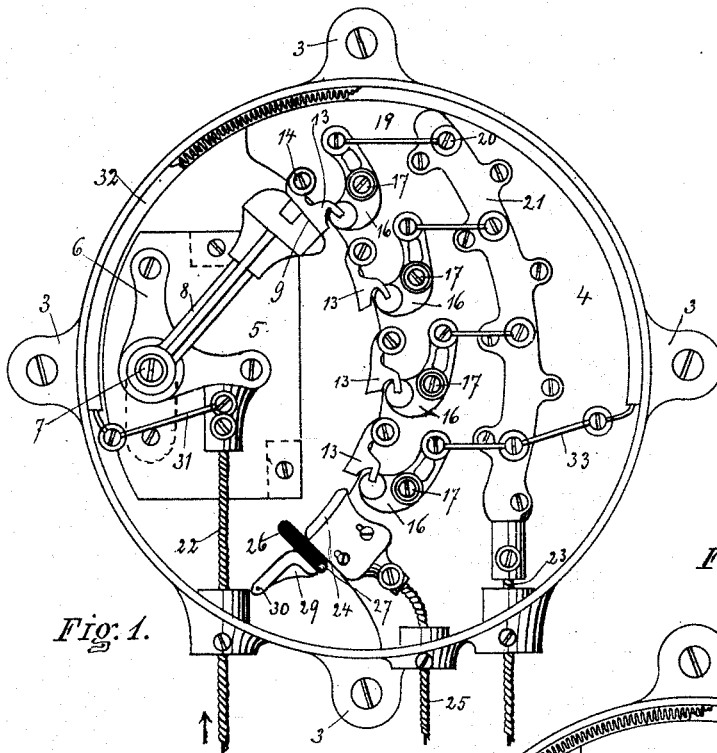


Fig. 1.

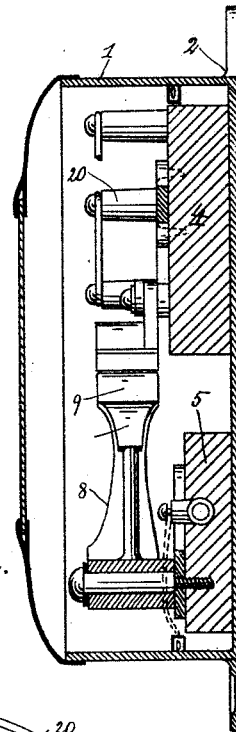


Fig. 3.

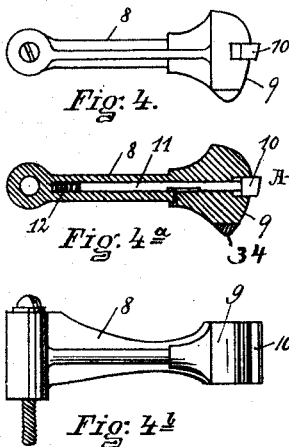


Fig. 4.

Fig. 4a.

Fig. 4b.

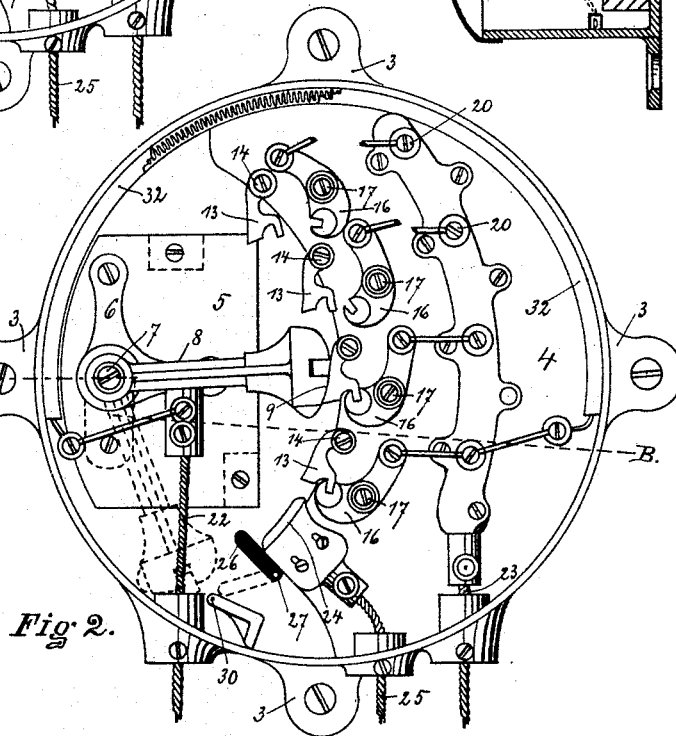


Fig. 2.

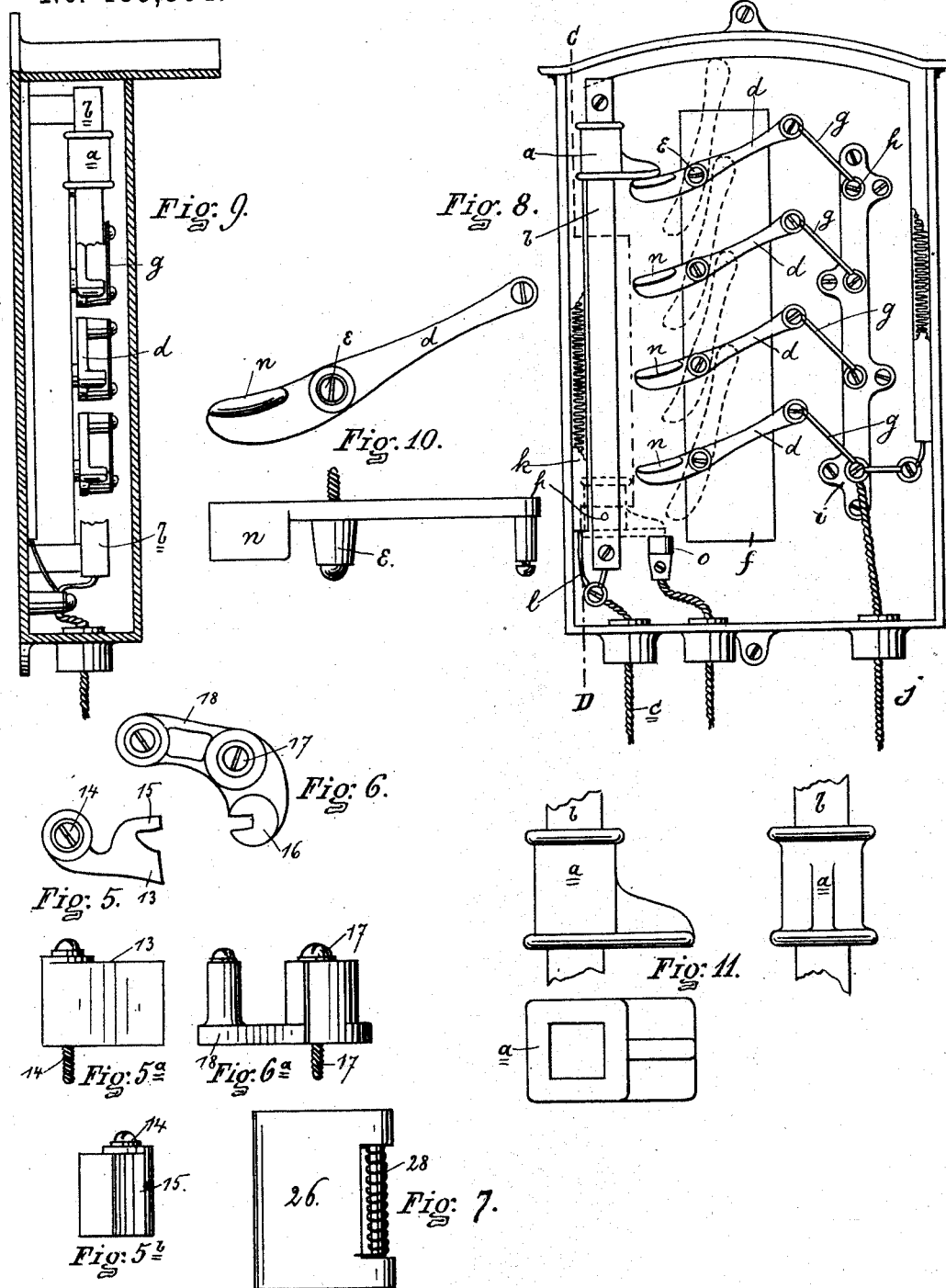
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UNITED STATES PATENT OFFICE.

WILLIAM FR. BOSSERT, OF UTICA, NEW YORK, ASSIGNOR TO THE UTICA ELECTRICAL MANUFACTURING AND SUPPLY COMPANY, OF SAME PLACE.

COMBINATION FUSE-BOX.

SPECIFICATION forming part of Letters Patent No. 489,364, dated January 3, 1893.

Application filed December 14, 1891. Serial No. 415,064. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FR. BOSSERT, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Combination Fuse-Boxes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

My invention relates to an improvement in automatic electrical fuse boxes and in the device herein shown and described. The fuse box proper is shown in connection with a lightning arrester and circuit breaker.

In the drawings which accompany and form a part of this specification and in which similar letters and figures of reference refer to corresponding parts in the several figures, Figure 1 shows a front view of my device with the cover of the containing box removed. Fig. 2 shows the same parts in changed position and after several of the fuses have been melted. Fig. 3 shows a section taken on a line substantially with A—B of Fig. 2. Fig. 4 shows a swinging current conductor in detail, removed from the box. Fig. 4^A shows a central longitudinal section of the device shown in Fig. 4. Fig. 4^B shows a side view of the device shown in Fig. 4. Fig. 5 shows a movable supporter for engaging with the movable conductor. Fig. 5^A shows a side elevation of the device shown in Fig. 5. Fig. 5^B shows an end view of the catch. Fig. 6 shows a plan view of a pivoted catch. Fig. 6^A shows a side view of the catch. Fig. 7 shows a plan view of a movable shelf insulator. Fig. 8 shows a modified form of construction of my fuse box and lightning arrester. Fig. 9 shows an edge view of the device shown in Fig. 8. Fig. 10 shows a side and plan view of a movable supporter for and engaging with the movable conductor. Fig. 11 shows a side and plan view of the movable current conductor used in connection with the devices shown in Figs. 8, 9 and 10.

Referring more specifically to the reference

numerals marked on the drawings in a more particular description of the device: 1 indicates the box or casing which is circular in form in the device shown and is mounted upon a suitable back 2, provided with perforated ears as 3 for securing the box to a wall or other support. Secured in the box are preferably provided two pieces of insulator as 4 and 5, upon which are mounted the working parts of the device. On the piece 5 is mounted a suitable metal base piece 6, on which is pivoted at 7 a movable or swinging current conductor 8, which conductor is provided with a rounded and eccentric contact face 9 and in which contact face is preferably located a movable engaging piece 10, mounted upon a reciprocating shank 11 in a central opening in the conductor and actuated by a spring 12. The swinging end or face 9 of the current conductor is adapted to engage with the movable supporter 13, pivoted upon the insulator 4 at 14 and provided with a curved engaging surface and a projecting ear 15, adapted to be engaged by catch 16, which catch is pivoted at 17 on the insulator 4 and provided with a projecting arm 18, to which may be attached a fuse wire 19. The opposite end of the fuse wire is attached to a post 20, located on and in connection with a metal base 21, also mounted upon the insulator 4 and which acts as a current conductor. Two or more of the movable supporters, as 13, are located in the line of movement of the engaging face of the movable conductor and each supporter is secured by means of a fuse wire extending to the conductor base 21. The posts 20 are provided at substantially equal distances from the catches 16 which makes the several fuse wires of substantially the same length. To the base piece 6 mounted on insulator 5 is attached one of the current wires 22 and to the base piece 21 mounted on insulator 4 is attached the other current wire 23, also in the line of movement of the face of the movable conductor is located a contact surface 24, secured upon insulator 4 and to which is attached a wire 25, which may be a ground wire. At the lower end of the surface 24 is located a movable shelf piece 26, which is made of insulating material and is mounted upon a

pivot 27 and provided with a spring 28 (see Fig. 7.) which retains the shelf 26 normally in the position shown in Figs. 1 and 2.

Under the shelf 26 is a brace 29 pivoted to the casing at 30. From the base 6 to which one of the current wires is attached extends a fuse wire 31 which connects with one end of a resistance coil 32, which extends around the inner side of the casing and is connected at its opposite end by a fuse wire 33 with the conductor base 21. On the lower side of the movable conductor is secured an insulator 34 adapted to hold the conductor out of electrical connection with the case when it swings into its lowest position.

In the modified forms of construction shown in Figs. 8, 9 and 10 in lieu of the movable conductor shown in the previous figures is used a sliding conductor piece *a*, sliding on a vertical rod *b* which is mounted on insulators and to which is connected one of the current wires *c*. In this modified form of construction the movable supporter is in the shape of a pivoted lever *d*, pivoted at *e* on an insulator *f* and to one end of which lever is attached the fuse wire *g*, the other end of the fuse wire being attached to a post *h* on conductor *i* mounted on suitable insulators in the case and to which is attached the other current wire *j*. There is also used in connection in the modified form a resistance coil *k* which is connected by a wire *l* with current wire *c* and by fuse wire *m* with the opposite current wire. The lever *d* is provided with a wide contact face *n* and in which also resides the excess of weight so that it acts as a counter-weight and tends to cause the lever to stand vertically on its pivot. Two or more of the pivotal levers are preferably provided in series adapted to engage with the sliding contact piece *a* as it descends on the way or post *b*.

The operation of the device may be substantially as follows: Starting with the device in the position shown in Fig. 1 in which the several fuse wires 19 are in position and the catches 16 in engagement with the movable supports 13 and the supports in position to engage with the face of the movable conductor and the whole device in an electrical circuit. It will be observed that the current will pass in through conductor 22, thence through base piece 6, movable conductor 8, movable supporter 13, catch 16, fuse wire 19, post 20 and conductor base 21 and thence to the other current wire 23. The current may pass in through one and out through the other in either direction through the connections just described. When an excessive current is carried by the wire and such as will melt the upper fuse wire 19, the catch 16 will be released and being counter-weighted in its lower end, disengages itself from movable supporter 13 and which supporter being released, allows the contact face 9 of the movable conductor 8 to swing down by its own gravity until it is arrested by coming in con-

tact with the next supporter 13 in the series. In the meantime and by reason of the break in the circuit the excessive current will be relieved and the circuit after the break is automatically re-established. On the repetition of an excessive current the next succeeding fuse wire is melted and the current broken and re-established as before described, and this operation will continue as long as there are unburned fuse wires 19 in the box. At the time that the circuit is broken and re-established to avoid or reduce the electric sparks which would otherwise be produced, I provide resistance coil 32 which may be constructed or made in any of several well known manners and which is connected at either end by means of fuse wires 31 and 33 with a conductor wire, so that at the instant that the circuit is broken the current is conducted through the resistance coil, thus obviating or reducing the tendency to throw sparks while the connection is broken and re-established.

When the device is used with the parts 26 and 29 in the position shown in Fig. 2 when the movable conductor has been released by the burning of the last fuse wire the conductor moves into contact with the plate 24 and is thereby grounded, if the plate 24 is connected with the ground, for an instant and as it continues to move downward it swings the shelf piece 26 on its pivot and against the tension of spring 28 Fig. 7 until it passes by and is arrested by coming in contact with the casing. Should any excessive current be received by the device after this the fuse wires 31 or 32 connecting with the resistance coil would be melted, which would break the final connection and finally completely break the circuit until the device was readjusted. The piece 26 being made of insulating material prevents a spark being thrown from the conductor to the ground plate after the conductor has finally passed the ground plate.

In case it is desired to ground after all the fuse wires are burned the brace 29 is brought into engagement with the piece 26, which detains the movable conductor in connection with the ground and grounds the current until the device has been adjusted. The movable piece 10 in the face of the movable conductor is provided to more completely and surely establish and get connection between the conductor and movable supporter.

In the modified form of construction shown in Figs. 8, 9 and 10 the sliding conductor *a* is raised above the upper lever and the several fuse wires are applied, holding the levers in the positions shown in Fig. 8, and the current passes through *c*, through conductor post *b*, movable conductor *a*, pivoted lever *d* and fuse wire *g* to plate *i* and thence to the other conductor wire *j*. When an excessive current acts the fuse wire *g*, through which the current is then passing, is melted, which allows lever *d* to assume substantially a vertical position and conductor *a* to slide down the post

d until it becomes engaged in the next supporter in the series. When the movable conductor *a* has passed the last supporter it may rest upon a plate *o*, which may be connected with a grounding wire or it may be supported clear of plate *o*, by a pin which would be applied in the opening shown at *p*. There is also used in this device a resistance coil *k* which operates the same as described in connection with the previous construction.

It is evident that many alterations and other modifications in a form and construction described may be made without departing from the equivalents of my construction. What I claim as new and desire to secure by Letters Patent is:

1. The combination of a movable conductor, a movable supporter therefor, a fuse wire for securing the supporter, a surface adapted to be engaged by the conductor as it moves, and connected with the earth, and a support for detaining the movable conductor after it has passed the surface, substantially as set forth.

2. The combination of a movable conductor, a movable supporter therefor, a catch for securing the supporter, and a fuse wire holding the catch, substantially as set forth.

3. The combination of a movable conductor, two or more movable supporters therefor, catches for securing the supporters and fuse wires securing the catches and adapted to be brought successively into the circuit by the movement of the movable conductor, substantially as set forth.

4. The combination in a fuse box of a swinging conductor, a supporter for engaging and detaining the swinging conductor and catch for securing the supporter and a fuse wire connecting with and securing the catch, substantially as set forth.

5. The combination in a fuse box of a swinging conductor, two or more movable supporters adapted to engage and detain the movable conductor, catches for securing the several supporters and fuse wires connecting with each of the catches, substantially as set forth.

6. The combination in a fuse box of a conductor wire 22, a movable swing conductor 9, two or more movable supporters 13 adapted to successively detain the movable conductor, a catch for securing the supporter and fuse

wires 19 connecting with and securing the catches and current wire 23 connecting with the fuse wires, substantially as set forth.

7. The combination of a current wire, a movable current conductor, a supporter for detaining the movable conductor, a fuse wire in the circuit for securing the supporter, a contact surface located below the supporter and adapted to be engaged by the movable conductor and an automatic adjustable shelf at the lower end of the contact surface, substantially as set forth.

8. The combination of a current wire, a movable conductor connecting with the current wire, a movable supporter adapted to engage and detain the movable conductor, a fuse wire in the circuit for connecting with and securing the supporter, a ground plate adapted to be engaged by the movable conductor, an automatically movable insulator adapted to interpose itself between the ground plate and the movable conductor after it has passed the ground plate, substantially as set forth.

9. The combination in a fuse box of a conductor wire and pivoted swinging conductor 8 connected therewith, two or more movable supporters 13, adapted to successively engage and support the movable conductor, catches for securing the supporters, fuse wires connecting with and securing the catches and being successively in circuit as the conductor moves, and a resistance coil located in a shunt around the fuse wires, substantially as set forth.

10. The combination in a fuse box of a conductor wire, a movable swinging current conductor 8, movable supporters 13 adapted to successively be engaged by and support the movable conductor, catches for securing the supporters, fuse wires securing the catches and being successively in the circuit as the conductor moves, a resistance coil located in a shunt around the fuse wires, substantially as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

WILLIAM FR. BOSSERT.

Witnesses:

MILTON E. ROBINSON,
H. W. BOOTH.