

(No Model.)

2 Sheets—Sheet 1.

G. T. VOORHEES.
MULTIPLE FUSE CUT-OUT.

No. 569,692.

Patented Oct. 20, 1896.

Fig. 1.

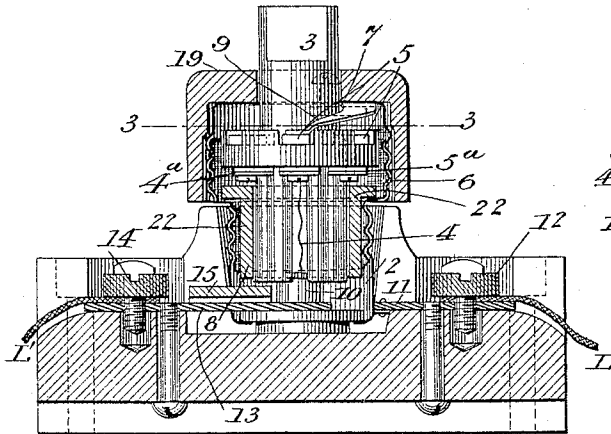


Fig. 2.

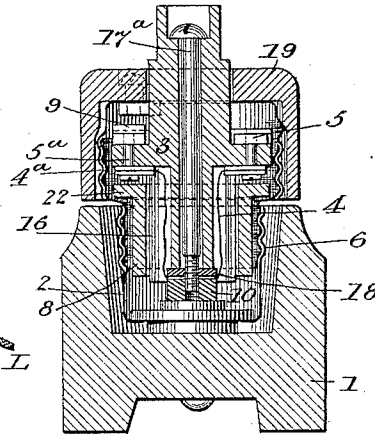


Fig. 3.

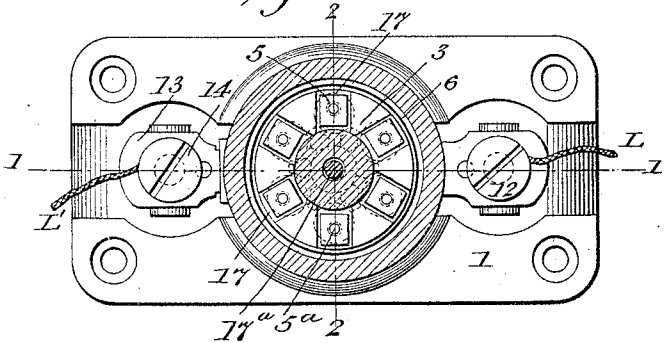


Fig. 5.

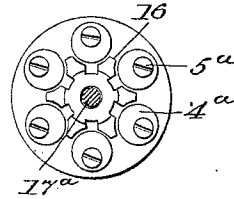
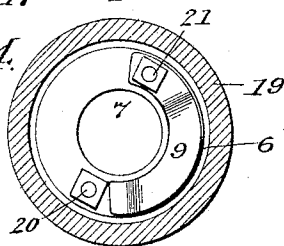


Fig. 4.



Witnesses.

E. A. Allen.

G. H. Chase

Inventor.

Gardner T. Voorhees
by his attorney,
Edward S. Beach.

(No Model.)

2 Sheets—Sheet 2.

G. T. VOORHEES.
MULTIPLE FUSE CUT-OUT.

No. 569,692.

Patented Oct. 20, 1896.

Fig. 6.

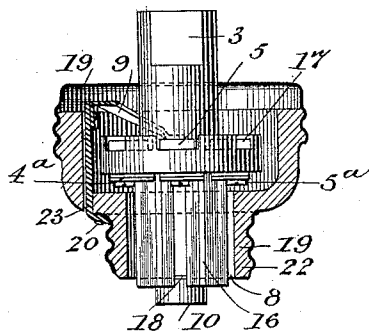


Fig. 7.

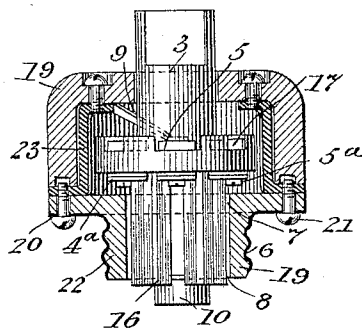


Fig. 8.

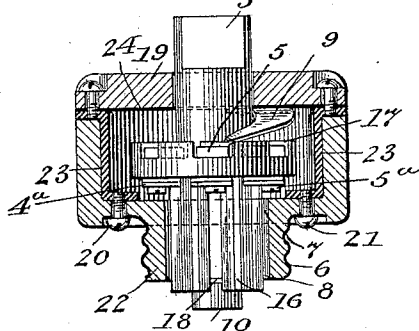
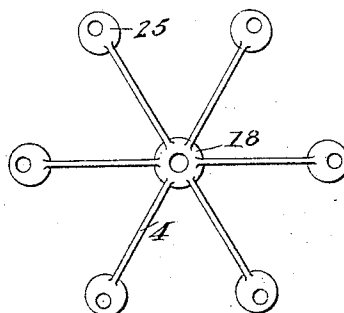


Fig. 9.



Witnesses.

E. A. Allen.

Geo H. Chase.

Inventor.

Gardner T. Voorhees

by his attorney
Edward S. Beach.

UNITED STATES PATENT OFFICE.

GARDNER T. VOORHEES, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
VOORHEES ELECTRIC COMPANY, OF SAME PLACE.

MULTIPLE-FUSE CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 569,692, dated October 20, 1896.

Application filed February 26, 1894. Serial No. 501,623. (No model.)

To all whom it may concern:

Be it known that I, GARDNER T. VOORHEES, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Multiple-Fuse Cut-Out, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a central section through my new cut-out at line 1 1 of Fig. 3. Fig. 2 is a similar sectional view on a line 2 2 of Fig. 3. Fig. 3 is a plan view of my new device, partly in section, on a line at 3 3 of Fig. 1, looking down in Fig. 1. Fig. 4 is a cross-sectional view on the line at 3 3 of Fig. 1, looking up in that figure, the fuse-carrier being removed. Fig. 5 is an end view of the fuse-carrier, showing the partitions which separate the fuses, the fuses and exposed contact being removed for greater clearness. Figs. 6, 7, and 8 show modifications of the plug. Fig. 9 shows a modification of the fuse-contacts and fuses.

Generally stated, the object of my invention is to produce a cheap and efficient multiple-fuse cut-out; and the nature of my invention is the combination of, first, a base having a socket to receive a fuse-carrier; second, a fuse-carrier having a plurality of fuses, and, third, conductors and contacts necessary to complete an operative multiple-fuse cut-out.

In the drawings illustrating the best form of my invention now known to me, 1 is the base; 2, the socket which receives the fuse-carrier 3; 4, a series of fuses; 5, a series of fuse-contacts at one end of the fuses; 6, an exterior conductor adapted to contact with socket 2 when the fuse-carrier 3 and socket are together. This exterior conductor is preferably a shell of conducting material and is called herein a "conducting-shell," because that is the preferred construction, although it is not essential to my invention that this exterior conductor 6 (preferably in the form of a shell) should surround the side walls of the fuse-carrier, and its area may be diminished, if desired, as will be plain to all skilled in the art.

7 and 8 are openings in the conducting-shell; 9, a conductor which connects conductor 6 with the fuses 4 *seriatim*, (preferably making contact directly with the fuse-con-

tacts 5,) and 10 is a fuse-contact at the other ends of the fuses.

Base 1 supports the fuse-carrier-receiving socket 2, which is of conducting material and in electrical connection with a lead L. Lead L' connects electrically with the fuse-contact 10, which, to insure the best electrical connection, is common to ends of all the fuses, although it might be subdivided into a series of fuse-contacts like the contacts 5, if so desired. Preferably, a metal bar or electrode 11 connects a binding-screw 12 (to which lead L is secured) with the socket 2, and a bar 13 preferably connects fuse-contact 10 with a binding-screw 14, to which lead L' is secured, this lead L' being insulated from socket 2 conveniently by the insulation 15. In this instance socket 2 and shell 6 are screwed together, as shown, and the current goes from lead L through bar 11, socket 2, shell 6, conductor 9, one of the fuses 4, fuse-contact 10, bar 13, and lead L'.

The fuse-carrier is of insulating material and the fuses are separated one from the other by its partitions 16, and the fuse-contacts 5 are arranged in recesses 17 in the fuse-carrier. The free end of the conductor 9 engages these contacts *seriatim* when the base and carrier are moved one in relation to the other. The free end of the conductor 9 preferably engages the portions of the fuse-carrier between the recesses in which the fuse-contacts are preferably located, and riding over these portions snaps upon the fuse-contacts and thereby indicates when conductor 9 is in proper contact with a fuse-contact. Screw 17^a passes through the fuse-plug, and in this construction screws into fuse-contact 10 to clamp the adjacent fuse ends against the disk 18 on the inner end of the fuse-carrier. A hood 19 supports shell 6, and the shell is secured to it conveniently by the fastenings 20 and 21.

For mechanical convenience shell 6 is formed of two shells, as shown in Figs. 1 and 2, which couple together, and the fuse-carrier at opening 7 in said shell is accessible for adjustment, preferably having a stem or handle which projects through opening 7 and a corresponding opening in hood 19. The shell is also formed with the opening 8, so as to ex-

pose contact 10 for connection with the lead L' either directly or through the electrode 13, as will be plain to all skilled in the art without further description. Ordinarily base 1 is stationary and fuse-carrier 3 rotatable, as shown, and when a fuse in service becomes useless a fresh fuse is brought into service by turning the fuse-carrier far enough to bring a fuse between the leads L L'.

10 Preferably, an insulating-shell 2^a is interposed between the fuse-carrier and shell 6 to prevent arcing between fuse and shell. In the construction above shown fuses 4 are provided with terminals 4^a, each of which is in
15 electrical connection with a contact 5 through a screw 5^a.

In Fig. 6, showing a modification, shell 6 is electrically connected with conductor 9 by a conductor 23 and shell 6 couples with the socket, as will be readily understood. A part of the hood in this form is a metallic cap.

In Fig. 7, showing another modification, shell 6 is electrically connected with conductor 9 by means of a conductor 23. Hood 19 is made in two parts, as shown, and these parts secured together by screws 20 and 21.

In Fig. 8 another modification is shown in which conductor 9 and shell 6 are connected by conductors 23, conductor 9 being supported by a conductor 24.

In Fig. 9, showing a modification, one set of fuse ends are soldered directly to a common contact 18 and their other ends are soldered to terminals 25, and these terminals
35 may serve either as the contacts 5 or as the terminals 4^a of the preferred form. When the construction shown in this figure is used, the fuses are bent to bring the contact 18 and terminal 25 into proper position, as will be
40 plain to all skilled in the art without more particular description.

The foregoing modifications are shown to more clearly indicate that my invention and the different features thereof may be embodied in a great variety of different forms without departing from my invention, it being obvious that my apparatus may be and in many cases must be altered in construction in order to practically combine a multiple-fuse
50 carrier with the socket of a cut-out.

Having thus described the best form of my invention now known to me and the mode of operation thereof, what I claim is—

1. As a new article of manufacture, a multiple-fuse cut-out, consisting of a fuse-carrier; a plurality of fuses carried thereby; a contact at one end of each fuse; an exposed contact for the other end of the fuse; a conducting-shell for the fuse-carrier; and a conductor connecting the shell with the fuses *seriatim*; the shell being formed with an opening, the exposed fuse-contact exposed at said opening, and the shell and carrier being movable one in relation to the other; all substantially as and for the purpose set forth.

2. As a new article of manufacture, a multiple-fuse cut-out, consisting of a fuse-carrier;

a plurality of fuses carried thereby; a contact at one end of each fuse; an exposed contact for the other end of the fuse; a conducting-shell for the fuse-carrier; and a conductor connecting the shell with the fuses *seriatim*; the shell being provided with two openings; the fuse-carrier being exposed at one of said openings; and the exposed fuse-contact being exposed at the other of said openings, all combined substantially as and for the purpose set forth.

3. As a new article of manufacture, a multiple-fuse cut-out consisting of a fuse-carrier; a plurality of fuses carried thereby; a contact for one end of each fuse; an exposed contact for the other end of the fuses, a conductor connecting the conducting-shell with the fuses *seriatim*; and an insulator intermediate the conducting-shell and the fuse-carrier, the conducting-shell having an opening at which the exposed fuse-contact is exposed and the shell and carrier being movable, one in relation to the other, all substantially as and for the purpose set forth.

4. The combination with a base and a fuse-cut-out-receiving socket, having a terminal within it which terminal is insulated from it, of a multiple-fuse cut-out comprising a multiple-fuse carrier; a plurality of fuses carried thereby; independent contacts for one set of fuse ends; an exposed contact for opposite fuse ends; a conducting-shell for the fuse-carrier; a conductor connecting the fuse-contacts *seriatim* with the conducting shell; the shell having an opening and coupling with said socket and the exposed fuse-contact electrically connecting with the terminal within said socket, all substantially as and for the purpose set forth.

5. In a multiple-fuse cut-out, the combination of a fuse-carrier, a series of fuses carried thereby and separated one from the other by partitions; a non-conducting shell about the fuse-carrier having an exposed shell-contact and a conductor connecting the exposed shell-contact and fuses *seriatim*, substantially as and for the purpose described.

6. As a new article of manufacture, a multiple-fuse cut-out consisting of a fuse-carrier, a plurality of fuses carried thereby, a contact at one end of each fuse, an exposed contact for the other end of the fuse, a non-conducting shell for the fuse-carrier carrying an exposed contact, and a conductor connecting the exposed shell-conductor with the fuses *seriatim*, the shell being formed with an opening, the exposed fuse-contact being exposed at said opening, and the shell and carrier being movable one in relation to the other, all substantially as and for the purpose set forth.

7. As a new article of manufacture, a multiple-fuse cut-out consisting of a fuse-carrier, a plurality of fuses carried thereby, a contact at one end of each fuse, an exposed contact for the other end of the fuse, a non-conducting shell for the fuse-carrier having an exposed shell-contact, and a conductor connect-

ing the exposed shell-contact with the fuses
seriatim, the shell being provided with two
openings, the fuse-carrier being exposed at
one of said openings, and the exposed fuse-
5 contact being exposed at the other end of said
openings, all combined substantially as and
for the purpose set forth.

8. As a new article of manufacture, a mul-
tiple-fuse cut-out consisting of a fuse-carrier,
10 a plurality of fuses carried thereby, a contact
for one end of each fuse, an exposed contact
for the other end of the fuses, a conductor
connecting the exposed shell-contact with the
fuses *seriatim*, and an insulator intermediate
15 the exposed shell-contact and the fuse-car-
rier, the insulator having an opening at which
the exposed fuse-contact is exposed, and the
insulator and carrier being movable one in
relation to the other, all substantially as and
20 for the purpose set forth.

9. The combination with a base and a fuse-

cut-out-receiving socket, having a terminal
within it, which terminal is insulated from it,
of a multiple-fuse cut-out comprising a mul-
tiple-fuse carrier, a plurality of fuses carried 25
thereby, independent contacts for one set of
fuse ends, an exposed contact for opposite
fuse ends, a non-conducting shell for the fuse-
carrier having an exposed shell-contact, a
conductor connecting the fuse-contacts *seri-* 30
atim with the exposed shell-contact, the shell
having an opening and coupling with said
socket so that the exposed shell-contact con-
tacts with said shell, and the exposed fuse-
contact contacts with the terminal within said 35
socket, substantially as and for the purpose
set forth.

GARDNER T. VOORHEES.

Witnesses:

EDWARD S. BEACH,
ALICE I. CRAWFORD.