

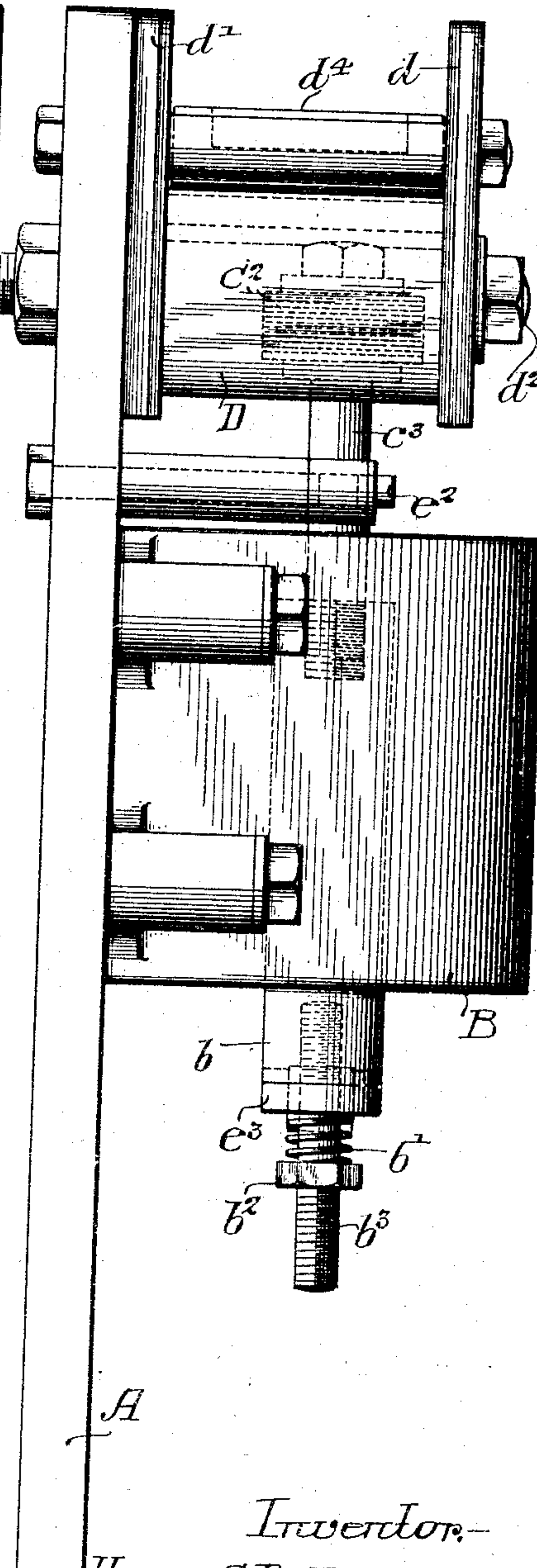
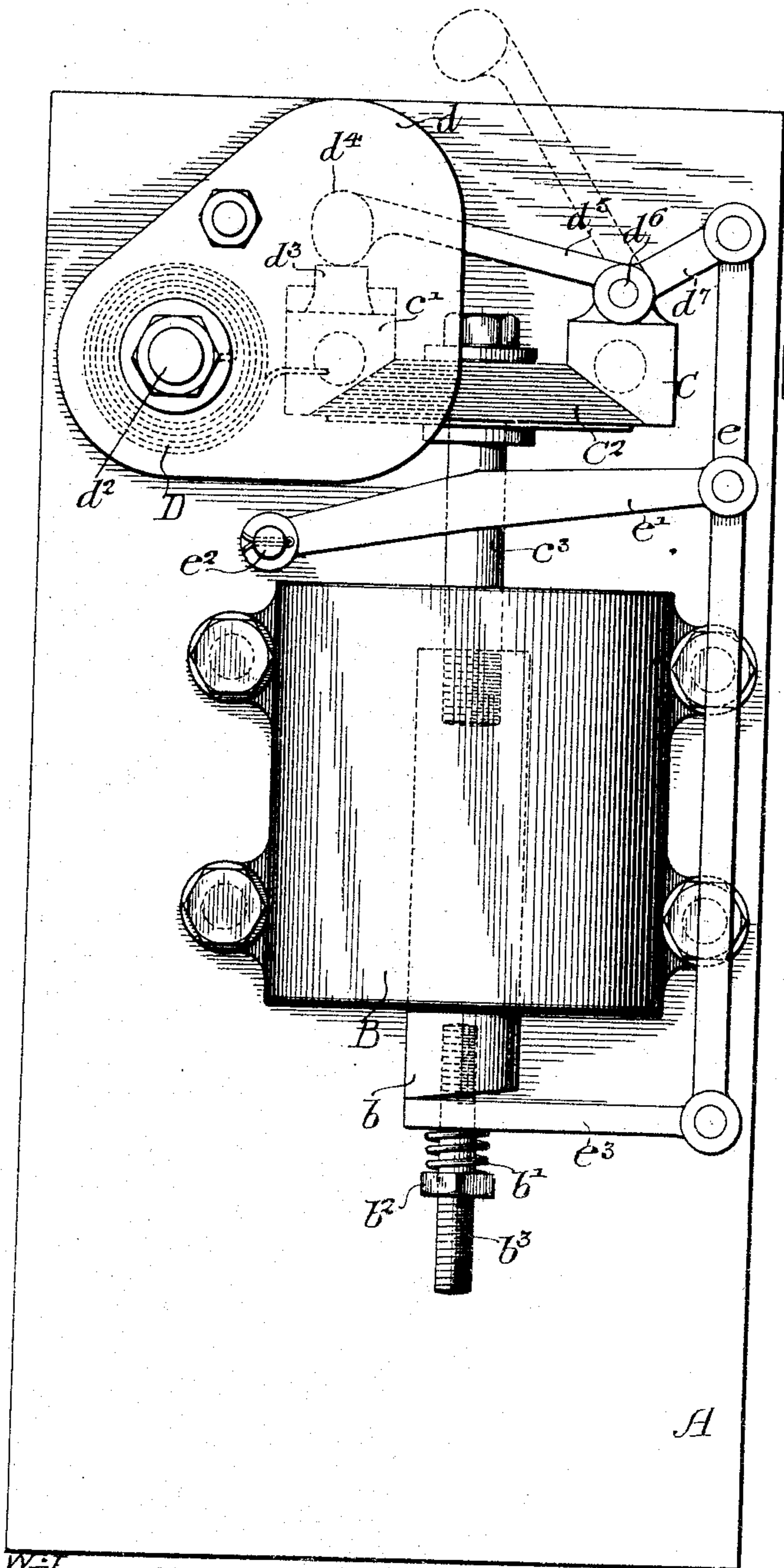
H. C. ROBINSON.
ELECTRIC SWITCH ATTACHMENT.
APPLICATION FILED AUG. 17, 1909.

956,421.

Patented Apr. 26, 1910.

Fig. 1.

Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

HARRY C. ROBINSON, OF COATESVILLE, PENNSYLVANIA.

ELECTRIC-SWITCH ATTACHMENT.

956,421.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed August 17, 1909. Serial No. 513,314.

To all whom it may concern:

Be it known that I, HARRY C. ROBINSON, a citizen of the United States, residing in Coatesville, Pennsylvania, have invented certain Improvements in Electric-Switch Attachments, of which the following is a specification.

One object of my invention is to provide an electro-magnetic switch, particularly of the type shown in my application for Patent No. 491,206, filed April 21, 1909, with means whereby the movable member of its auxiliary or arc-breaking contacts is positively pressed against the fixed member thereof, with a view to securing good and complete electrical contact.

It is further desired to provide an electro-magnetic switch with means whereby its solenoid or magnet is enabled when energized, to positively press the movable members of both its main and of its auxiliary contacts into engagement with each other, with a view to securing the best possible contact.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which:—

Figure 1, is a front elevation of an electro-magnetic switch showing my invention as applied thereto; and Fig. 2, is a side elevation of the device shown in Fig. 1.

In the above drawings, A represents a supporting base of marble, slate, or other insulating material on which is mounted a suitable electro-magnet, having in the present instance the form of a solenoid B, provided with a core b whose lower end is slightly beveled.

Two fixed main contacts c and c' are provided and each is made with a beveled or inclined face as shown, so that they may be electrically connected by means of a blunt wedge shaped laminated contact member c^2 carried on the end of a fiber rod c^3 rigidly fixed to the core b . In addition, a blow magnet D is mounted upon the panel A and is provided with pole pieces d and d' , one end of its winding being in electrical connection with the fixed contact c' and its other end with a bolt d^2 about which the winding, usually a suitably insulated copper ribbon, is wound. Said pole pieces d and d' extend over or include between them the ends of the auxiliary or arc-breaking contacts d^3 and d^4 which are preferably mount-

ed on the main contacts c and c' in the manner set forth in my above mentioned application for patent.

The movable contact d^4 is carried on, and in the present instance forms a part of, a lever arm d^5 pivoted by a pin d^6 to the second main contact c . A second arm d^7 is formed integral with the arm d^5 , being preferably about one-half or one-third the length thereof, and having connected to its outer end a link e which extends vertically downward alongside of the casing of the solenoid B. This link has pivoted to it above the solenoid a guiding arm e' movably pinned to the panel A at e^2 and there is pivotally connected to its lower end an arm e^3 projecting under the solenoid. The end of said arm is provided with a hole for the reception of a bolt b^3 screwed into the lower end of the core b and having a holding nut b^2 , between which and the arm e^3 is confined a spring b' .

Whenever the solenoid is energized, the core b is drawn into the same so as to occupy the position shown in full lines in Fig. 1, with the result that the laminated contact c^2 of the switch is forcibly pressed against the two beveled contact surfaces of the main contacts c' and c , thereby completing a circuit through the contacts c , c^2 , c' and the winding of the blowout magnet D to the terminal or post d^2 . At the same time the lower end of the core attracts the arm e^3 , thereby pressing upwardly on the link e and the arm d^7 and pressing down on the arm d^5 , so that the contact d^4 is positively held against the carbon or other contact block d^3 .

The construction and arrangement of the end of the core b is such that when the solenoid is energized one end of the arm e^3 rests upon or directly contacts with a limited portion of one side of the lower end of said core, extending across the remainder of said face, but at an increasing distance therefrom. Hence by reason of this beveled construction of the end of the core, there is always an upward pressure exerted by said core upon the arm e^3 , the link e , and the end of the arm d^4 as long as the solenoid is energized, so that an auxiliary or arc breaking circuit is completed through the main contact c , the arm d^5 , and the auxiliary contacts d^4 and d^3 . Although these latter contacts are forcibly pressed into engagement as above noted, the spring b' forms a yielding connection between the core and the holding levers and links of the auxiliary contacts, so

that there is no possibility of a change of adjustment of one set of contacts affecting the operation of the others. When the solenoid B is deenergized, the core *b* drops, first separating the laminated contact *c*² from the two fixed contacts *c* and *c'*, and afterward separating the auxiliary contact *d*⁴ from the contact *d*³, at which latter points the current through the switch is finally broken and the arc immediately thereafter blown out by the action of the magnet D.

I claim:—

1. In a switch, the combination of main and auxiliary contacts; electro-magnetic operating means for the switch; and means connected to said operating means for pressing together the auxiliary contacts, the same including a connection between the movable auxiliary contact and the switch operating means; with means actuated by the main movable contact for separating the auxiliary contacts when the operating means is deenergized.

2. The combination in a switch of main contacts; a fixed auxiliary contact; a movable auxiliary contact pivoted to one of the main contacts and capable of engaging the fixed auxiliary contact; with a magnet having means for positively holding the main contacts and the auxiliary contacts in their closed positions.

3. The combination of a pair of fixed main contacts; a movable contact capable of connecting said fixed contacts; a solenoid having a core connected to said movable contact; a fixed auxiliary contact; a movable auxiliary contact; a plurality of loosely connected members joining said contact with the core of the solenoid for positively pressing the movable auxiliary contact against the fixed auxiliary contact when the solenoid is energized; and means connected to said members for separating the auxiliary contacts when the solenoid is deenergized.

4. The combination of a pair of fixed main contacts; a movable contact capable of connecting said fixed contacts; a solenoid having a core connected to said movable contacts; a fixed auxiliary contact; with a movable auxiliary contact; and mechanism including an armature yieldingly connected to the core of the solenoid for causing said movable auxiliary contact to be pressed against the fixed auxiliary contact when the solenoid is energized.

5. The combination in a switch of two fixed contacts; a movable contact capable of electrically connecting the same; a solenoid having a core placed to hold the movable

contact in engagement with the fixed contact against the action of gravity; fixed and movable auxiliary contacts; and means including an armature, yieldingly connected to the core of the solenoid for connecting the movable auxiliary contact with said core to cause said contact to be pressed against the fixed auxiliary contact when said solenoid is energized.

6. A switch including main contacts of which one is movable, a solenoid having a core capable of holding the movable contact in engagement with the fixed contacts against the action of gravity, an auxiliary contact pivotally mounted on one of the fixed contacts and capable of engaging the other contact, and means connecting the movable auxiliary contact with the core of the solenoid.

7. The combination in a switch of a solenoid having a core with a beveled end, main switch contacts of which one is connected to said core, and auxiliary switch contacts of which one is connected to the beveled end of the core.

8. The combination in a switch of a solenoid having a core with a beveled end, main switch contacts of which one is connected to said core, and auxiliary switch contacts of which one is yieldingly connected to the beveled end of the core.

9. The combination in a switch of a supporting structure, two fixed main contacts of which one is provided with a fixed auxiliary contact and the other has pivoted to it a lever of which one arm constitutes a movable auxiliary contact capable of engaging the fixed auxiliary contact, a link connected to said lever, an armature connected to said link, a movable main contact, and a solenoid having a core arranged to hold said movable main contact in engagement with the fixed main contacts against the action of gravity, said core acting on said armature to forcibly press together the auxiliary contacts.

10. The combination in a switch of main and auxiliary contacts, a solenoid for operating the switch, an armature yieldingly connected to the core of the solenoid, and means connecting said armature with one of the auxiliary contacts.

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

HARRY C. ROBINSON.

Witnesses:

WILLIAM S. G. COOK,
JOHN E. SCOTT.