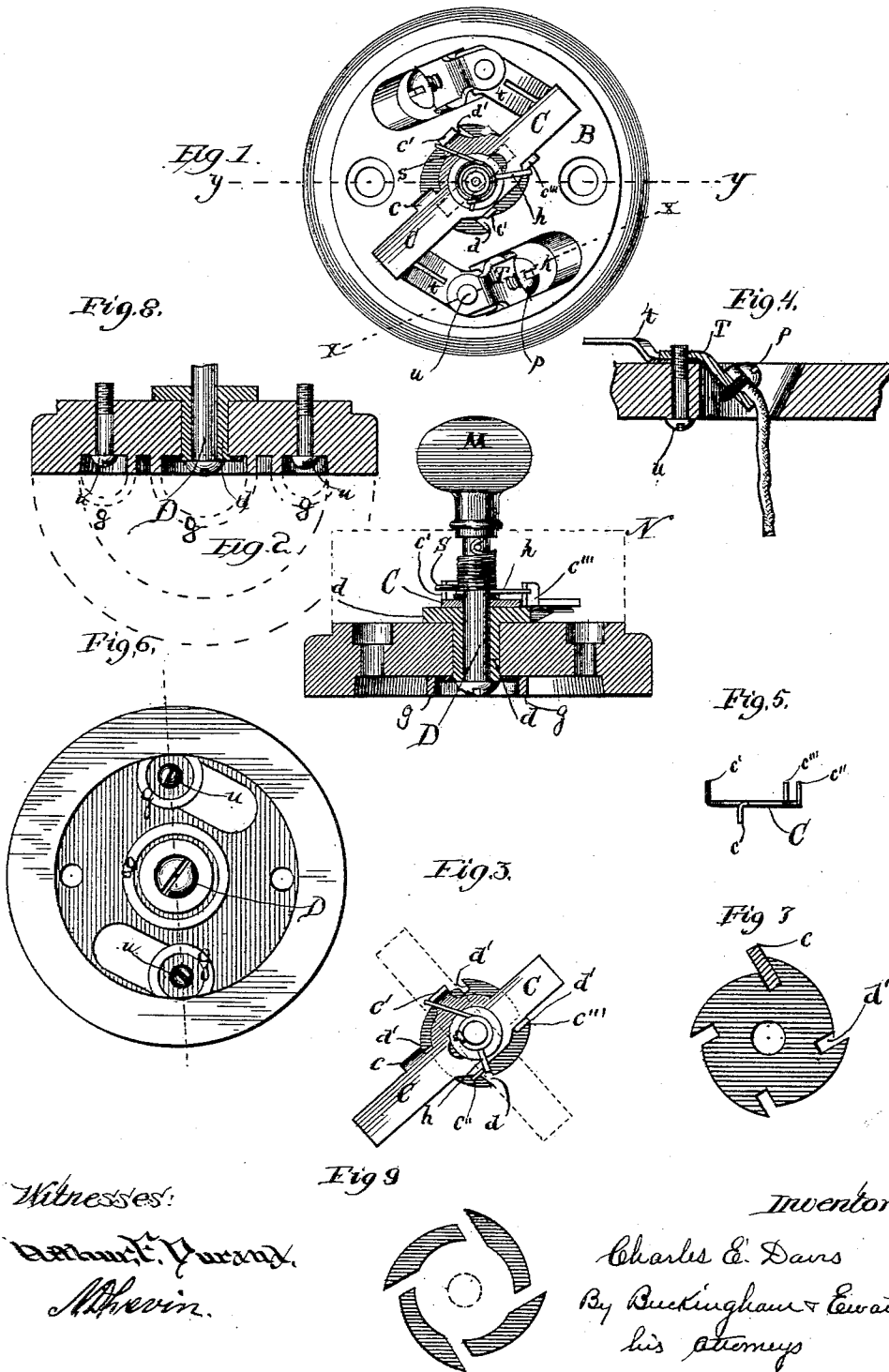


(No Model.)

C. E. DAVIS.
ELECTRIC SWITCH.

No. 476,613.

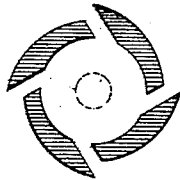
Patented June 7, 1892.



Witnesses:

Arthur E. Puran,
Alfred W. Mhevin.

Fig 9



Inventor:

Charles E. Davis
By Buckingham & Ewart
his Attorneys

UNITED STATES PATENT OFFICE.

CHARLES E. DAVIS, OF CHICAGO, ILLINOIS.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 476,613, dated June 7, 1892.

Application filed February 20, 1891. Serial No. 382,136. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. DAVIS, of Chicago, Illinois, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification, reference being had to the accompanying drawings, in which similar letters of reference indicate like parts in all the figures.

My invention relates to that class of electric switches in which a revoluble bar by its successive partial rotations alternately makes and breaks contact with the electric terminals mounted on the base, the rotation of the bar being checked during the charging of an elastic connection between the bar and an arbor mounted in the base and adapted to manual rotation and then suddenly released, causing both the making and breaking of the contact with the terminals to be quick, sharp, and sudden; and my invention consists in this regard in adapting the revoluble contact-bar to be moved laterally out of engagement with a fixed catch upon the base and to be rotated partially and retracted to engagement with a succeeding catch.

My invention also relates to improved means for preventing reverse rotation of the bar and the arbor, to improvements in the binding-terminals on the base for admitting ready attachment of the circuit-wires, and to improved means for insulating the metallic parts on the under side of the base from possible contact with the wall or structure to which my improved switch may be attached; and my improvements consist in the devices shown in the drawings and explained and claimed hereinafter.

In the drawings, Figure 1 shows a plan view of my improved switch. Fig. 2 shows a section of the same through the line *y y*. Fig. 3 shows the position of the parts after the bar has been moved laterally out of engagement with the catch and is about to rotate under the influence of the charged elastic connection between the bar and the arbor. Fig. 4 is a section of Fig. 1 through the line *x x*, showing the construction of the binding-terminal. Fig. 5 is an end view of the revoluble contact-bar. Fig. 6 is an under view of the base, showing the method of insulation. Fig. 7 is a view showing the catches for checking rotation and the secondary catches for pre-

venting reverse rotation. Fig. 8 is a section of Fig. 6. Fig. 9 shows an alternate form of the checking and secondary catches.

In the figures, B is the base, composed of wood, porcelain, or other suitable insulating material and provided with binding-terminals T for the reception of the line-wires and with terminals *t*, preferably elastic.

C is the revoluble contact-bar, adapted to form contact with the brush-terminals *t* and to break contact therewith when partially rotated to the position shown by the dotted lines in Fig. 3.

D is an arbor mounted in the base through the bushing *d*, expanding on the upper side of the base, as shown in the figures. The expanded part is provided upon its periphery with four indentations *d'*, whose purpose will appear.

The bar C is provided with a slot, through which passes the arbor D, and which adapts the bar to a lateral as well as a rotary movement on the arbor.

The bar C' is provided with a downwardly-extending projection *c*, which is adapted to enter the indentation or catch *d'* and check the rotation of the bar until released by a lateral movement thereof, as shown in Fig. 3, which lateral movement is permitted by the slot.

Around the arbor D and having one end secured thereto is the spiral spring *s*, having its free end projecting radially and in contact with a lug *c'* on the bar and adapted by such contact when charged by rotation of the arbor to rotate the bar C. There is also projecting from the arbor D the pin *h*, normally pressing against the back-stop *c''*, preventing rotation of the arbor D in the reverse direction and maintaining always a certain amount of tension on the spring *s*, whereby the bar is held normally in a retracted position, with the projection *c* in engagement with the catch *d'*. The bar C is also provided with the lug *c''*, with which the pin *h* is adapted to engage when the arbor is forwardly rotated and which is at some little distance from the back-stop *c''*, so that there is a certain amount of lost motion on the part of the pin *h* between them.

In the operation of my device the first motion of the arbor causes the pin *h* to leave the

back-stop c''' and bear against the lug c'' , which movement charges the spring s with a certain amount of tension. A further rotation of the arbor causes the bar C to move laterally to the position shown by the full lines in Fig. 3, at which point the projection c escapes from the catch d' , and instantly thereupon the charged spring rotates the bar to the position shown by the dotted lines in Fig. 3, causing an instantaneous separation of the ends of the bar from the terminal brushes t and making a double break in the circuit.

It will be observed that the radius to the point of contact between the spring s and the projection c on the bar lies at about a right angle with the line of lateral movement of the bar, so that the spring s opposes the action of the pin h in moving the bar laterally out of engagement with the catch. This disposition of parts causes the spring s to retract the bar laterally, bringing the projection c to its normal radial distance from the arbor D and adapting it to be engaged by the succeeding catch d' . This retraction is permitted from the fact that the pin h moves only with the arbor, and instantly upon the rotation of the bar the lug c'' advances out of the control of the pin, which is permitted by the lost motion between the lug c'' and the back-stop c''' . The indentations d' have both a forward and a rear face, as shown in Fig. 7, the forward faces acting as a series of catches to check the rotation of the bar and the rear faces acting as a series of secondary catches to prevent reverse rotation thereof. This prevention of reverse rotation is necessary both for the reason that there would not be a sufficiently quick make and break of contact in operating the switch in that manner, but also it prevents rotation of the arbor D and enables me to unscrew the thumb-screw M on the arbor D and remove from the switch the shell N .

In Fig. 4 is shown a section of my improved terminal, which consists of two parts, one part T provided with the binding-screw for attaching the wire and the other part t consisting of a brush and adapted to establish an elastically-supported contact with the bar C . The part T , bearing the binding-screw P , is bent at an angle, as shown in Fig. 4, adapting it to be attached to the surface of the base, with the part carrying the binding-screw deflecting into the aperture k neither horizontally nor vertically, but at about the angle shown in Fig. 4. This disposition is of especial advantage in bringing the binding-screw beneath the surface of the base and out of the way of the rotating bar C , in admitting the ready placing of the wires between the head of the binding-screw and the terminal without the necessity of more than a trifling bending of the wire, and at the same time renders the binding-screw accessible for use of a screw-driver in manipulating the binding-screw. The side walls of the aperture K serve to re-

tain the alignment of the terminal when attached to the base by a single screw u . The part t is made thinner than the part T to give it elasticity, as above explained. The free end is bent suitably to form contact with the bar, and the other end is bifurcated, as shown in Figs. 1 and 4, and is placed upon the base beneath the part T and secured thereto by the same screw u , the bifurcations extending on each side of the part T , and thus with a single screw I attach the two parts to the base and maintain them in proper position.

To prevent possible contact with the wall to which my switch may be placed of the metallic connections on the under side, I form the base with a sort of wall around each of the metallic parts, as shown in Fig. 6, and into the interior I put any well-known vitreous insulating medium. I am aware that the metallic parts have been insulated by covering them with plastic or vitreous insulation placed in countersunk holes in the base, and I do not claim that, my purpose being to effect a saving in material and to decrease the weight of the base, and therefore, instead of making the general section of the base so thick as to admit of countersinking the holes, I place the metallic parts on the general level of the thin base and surround them with a wall of the same material.

In the drawings I have shown the catches as being formed in the periphery of the expanded stationary bushing around the arbor. I do not wish to limit myself to this construction, all that is required being a face presented to check the forward rotation of the bar, a secondary face adapted to prevent reverse rotation thereof, and means for guiding the engaging projection on the bar over the face of the secondary catch, so that it may be retracted by the spring s into engagement therewith. I may do this by placing four separate studs in the base, as shown in Fig. 9.

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

1. In an electric switch, the combination of a base B , a switch-bar C , having a straight slot therein, the catches d' , the co-operating pin c , the arbor D , provided with the pins h , adapted to engage with the switch-bar and to move it parallel to itself out of engagement with the catch d' , with which it is in contact, and the spring s for rotating the bar and retracting it to engagement with the succeeding catch.

2. In an electric switch, the base having the catches d' , the co-operating pin c thereon, the slotted switch-bar, a projecting pin, as h , on the arbor, engaging in both directions with projections on the switch-bar, with lost motion between them, and the spring s on the arbor, in engagement with the switch-arm, combined and operating substantially as described.

3. In an electric switch, the combination of the base B , the catches, as d' , the co-operating pins c , the slotted switch-bar C , the arbor D ,

a lost-motion-engaging connection between the arbor D and the bar C, adapted to move the bar laterally out of engagement with the catch *d'* and permit its rotation and retraction to a succeeding catch.

4. In an electric switch, the base provided with an aperture for the passage of the line-wire, a binding-terminal consisting of the thick part T, bent angularly into the aperture and provided with a screw P, and the

brush *t*, having one end beneath the thick part T, which is secured to the base and which clamps the brush thereto by means of the screw *u*.

Executed this 11th day of February, 1891. 15

CHARLES E. DAVIS.

In presence of—

A. M. HEYL,

E. JOHNSON.