(No Model.) 2 Sheets—Sheet 1.

H. BARTON.

ELECTRIC SWITCH.

No. 465,444. Patented Dec. 22, 1891.

FIG. 1.

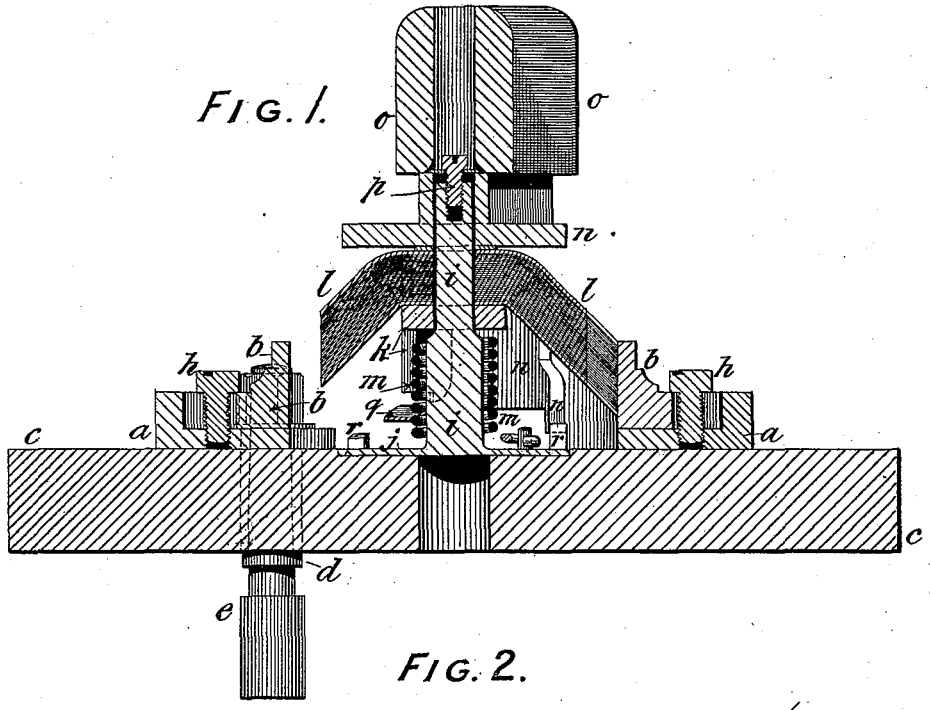
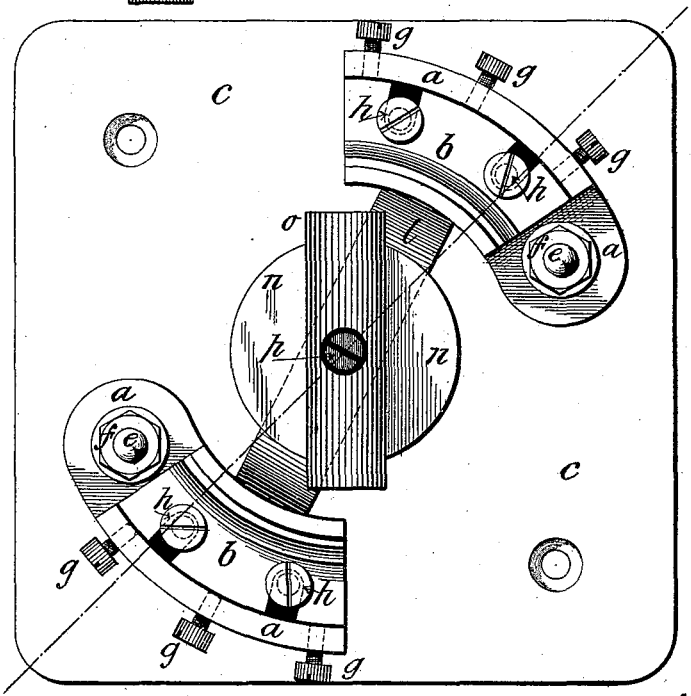


FIG. 2.



WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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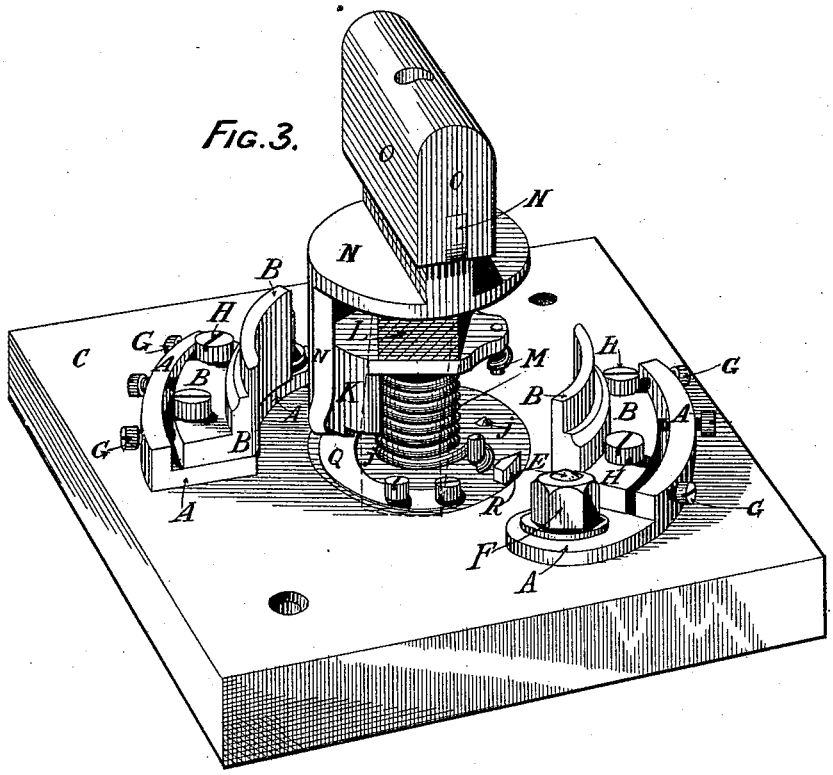
ELECTRIC SWITCH.

No. 465,444. Patented Dec. 22, 1891.

FIG. 3.



WITNESSES
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UNITED STATES PATENT OFFICE.

HENRY BARTON, OF LONDON, ENGLAND, ASSIGNOR TO JOHN ABBOTT ILIFFE, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 465,444, dated December 22, 1891.

Application filed December 15, 1890. Serial No 374,768. (No model.) Patented in England November 1, 1890, No. 17,560.

To all whom it may concern:

Be it known that I, HENRY BARTON, a subject of the Queen of England, residing at Ferdinand Street, London, in the county of Middlesex, England, have invented certain new and useful Improvements in Locked Switches for Electric-Current Circuits, (for which British Letters Patent have been applied for by an application dated 1st day of November, 1890, No. 17,560,) of which the following is a specification.

This invention relates to certain improvements in that class of electric switches in which, when the circuit connections are made, the brush (or connecting-piece between the terminal contacts) is locked in position against vibratory action or accidental touch and can only be released by pressure properly applied at the handle.

The invention constitutes improvements upon British Letters Patent No. 6,267, dated April 29, 1887, and No. 18,825, dated December 24, 1888, the object being to still further increase the efficiency, while reducing the cost of the said switches. This is accomplished by making cylindrical contacts instead of face-contacts upon a flat plate, as formerly, forming and arranging the contact-making brush so as to produce an automatic outward spring in a radial direction against cylindrical contact-pieces, and dispensing with the vertical down-pressing spring hitherto employed to make good contacts, a new method of attaching the handle to the spindle, and an improved or cheaper method of constructing and finishing the contact-pieces and of mounting them upon the slate or other base used, and solid stops are cast upon the central plate instead of using inserted screw studs or pins, as before.

In the further description of this invention reference is made to the accompanying drawings, in which—

Figure 1 is a vertical section through a switch. Fig. 2 is a plan of the same, each showing the contact-brush in position when the terminals are connected. Fig. 3 is a perspective view of the said switch with the terminals disconnected, the contact-brush being at right angles to its former position.

The front of the brush is cut away, as indicated by the dotted lines, to show the construction more clearly.

Each cylindrical contact consists of two brass plates mounted one upon the other, each plate forming an arc of a circle. These plates, distinguished as the lower plate *a* and upper plate *b*, are first formed or cast as a ring, turned and bored in that condition, and subsequently cut into pieces, thus reducing the cost of manufacture. Each lower plate *a* for a separate contact is first mounted upon the slate or other non-conducting base *c* by screws (not shown) passing through the base from the bottom into screw-holes in the lower plate *a*. A conically-bored bush *d* and terminal *e* is also passed through the base *c* from the bottom and through an extension of each lower plate *a*, as shown in Figs. 1 and 2, and firmly secured by a nut *f*, screwed upon the upper end of each terminal *e*. By mounting the lower plate *a* in this manner, and as shown in Fig. 2, breakage of the base is avoided. The lower plate *a* is flat on its upper surface, with the exception of an outer rim, which is screwed to receive two or more screws *g g*, placed horizontally. The upper plate *b* is made with a flange or base, on which it is seated on the lower plate *a*, while its inward portion stands well up in the form of a segment of a cylinder, which forms an inner or cylindrical contact-surface for the brush. Two or more slotted holes are made in the seated portion of the upper plate *b*, and screws *h h* are passed vertically through the same into the lower plate *a* to firmly secure the two together and insure perfect conduction. By slackening the vertical screws *h h* and screwing in the horizontal screws *g g* against the flange of the upper plate *b* the latter is forced inwardly to compensate for wear of the contact-surfaces and the screws *h h* are again made tight. Two cylindrical contacts, made as already described, are oppositely mounted upon a suitable non-conducting base *c*, with a suitable spindle *i* and base-plate *j*, also secured upon the base *c* exactly in the center. The central spindle *i* carries the locking-arm *k*, brush *l*, and coiled spring *m*, and these are turned about a quarter of a revolution around the stationary spin-

dle *i* against the pressure of the spring *m*, when the circuit is established, as shown in Fig. 2. The spindle *i* also carries the unlocking-arm *n*, securely attached to an ebonite handle *o* by its flattened top fitting within a groove in the said handle, and this is screwed to the stationary spindle *i* by a central screw *p*, so that by taking out the latter the handle *o* and unlocking-arm *n* are removable to prevent the switch being tampered with.

The brush *l* is composed of thin plates or leaves of copper centrally threaded upon the spindle *i*, with its ends bent downward at about an angle of forty-five degrees. The extremities of the brush are turned in a lathe, (or otherwise formed,) to be slightly larger in diameter than the space between the interior cylindrical faces of the upper plates *b b*, and, owing to the elasticity of the brush *l*, imparted by the bending above named, it may be turned by the handle and easily forced between the smaller space between the contact-faces of *b b*. The outward spring of the brush therefore serves to automatically make good contacts with the cylindrical faces of *b b*, even to compensating for a considerable amount of wear, while if this wear becomes excessive the cylindrical faces of *b b* are set inward by the screws *g g*, already mentioned.

The coiled spring *m* serves to pull round the brush *l*, locking-arm *k*, and unlocking-arm *n* when the handle *o* is turned sufficiently for the forward part of the arm *n* to ride over and depress the flat spring *q* out of the detent (not shown) on the locking-arm *k*, which suddenly breaks the circuit; but to meet the sudden shock caused by the release of the spring *m* solid stops *r r* are cast upon the base *j* solidly therewith, one being to arrest the arm *n*, as shown in Fig. 1, and with it the arm *k*, brush *l*, and handle *o*, against the action of the spring *m*, as aforesaid. The other one (on the left side of Fig. 1) is to limit the turning of the said parts when the circuit connection is made.

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

1. A locked electric switch comprising a laminated spring-brush *l*, centrally and freely suspended upon a vertical spindle *i* and bent downward from its support at an approximate angle of forty-five degrees, an actuating-handle *o*, a locking-spring *q*, a locking-arm *r*, an unlocking-arm *n*, a turning-spring *m*, and terminal cylindrical contacts, the spring-brush co-operating with the inner cylindrical face of the contacts, substantially as and for the purpose described.

2. In an electric switch, the combination of a laminated spring-brush centrally and freely suspended upon a vertical spindle *i* and bent downward from its support at an approximate angle of forty-five degrees, an actuating-handle *o*, a turning-spring *m*, and adjustable cylindrical terminal contacts, the spring-brush co-operating with the inner cylindrical face of the contacts, substantially as and for the purpose described.

3. In an electric switch, the combination of a lower plate *a*, an adjustable upper plate *b*, holding-screws *h*, adjusting-screws *g*, and a pivotal laminated spring-brush adapted to make contact with the said plate *b*, substantially as and for the purpose described.

4. In a locked electric switch, the combination of a spindle *i*, having a base *j*, a contact-making brush *l*, and an arm *n*, suspended on said spindle, a handle *o*, and screw *h* for securing said arm and handle to the said spindle, and terminal contacts, substantially as and for the purpose described.

5. In a locked electric switch, the combination of a laminated spring-brush *l*, an actuating-handle *o*, two oppositely-placed cylindrically-formed terminal contacts *b*, made adjustable inwardly, and a base-plate *a* for each contact, with adjusting-screws *g*, substantially as and for the purpose herein described.

6. In a locked electric switch, the combination of a spindle *i*, having a base *j* with stops *r* thereon, arm *n*, actuating-handle *o*, turning-spring *m*, brush *l*, and terminal contacts, operating substantially as and for the purpose herein described.

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

HENRY BARTON.

Witnesses:
K. TREECE,
E. C. BARKER.