

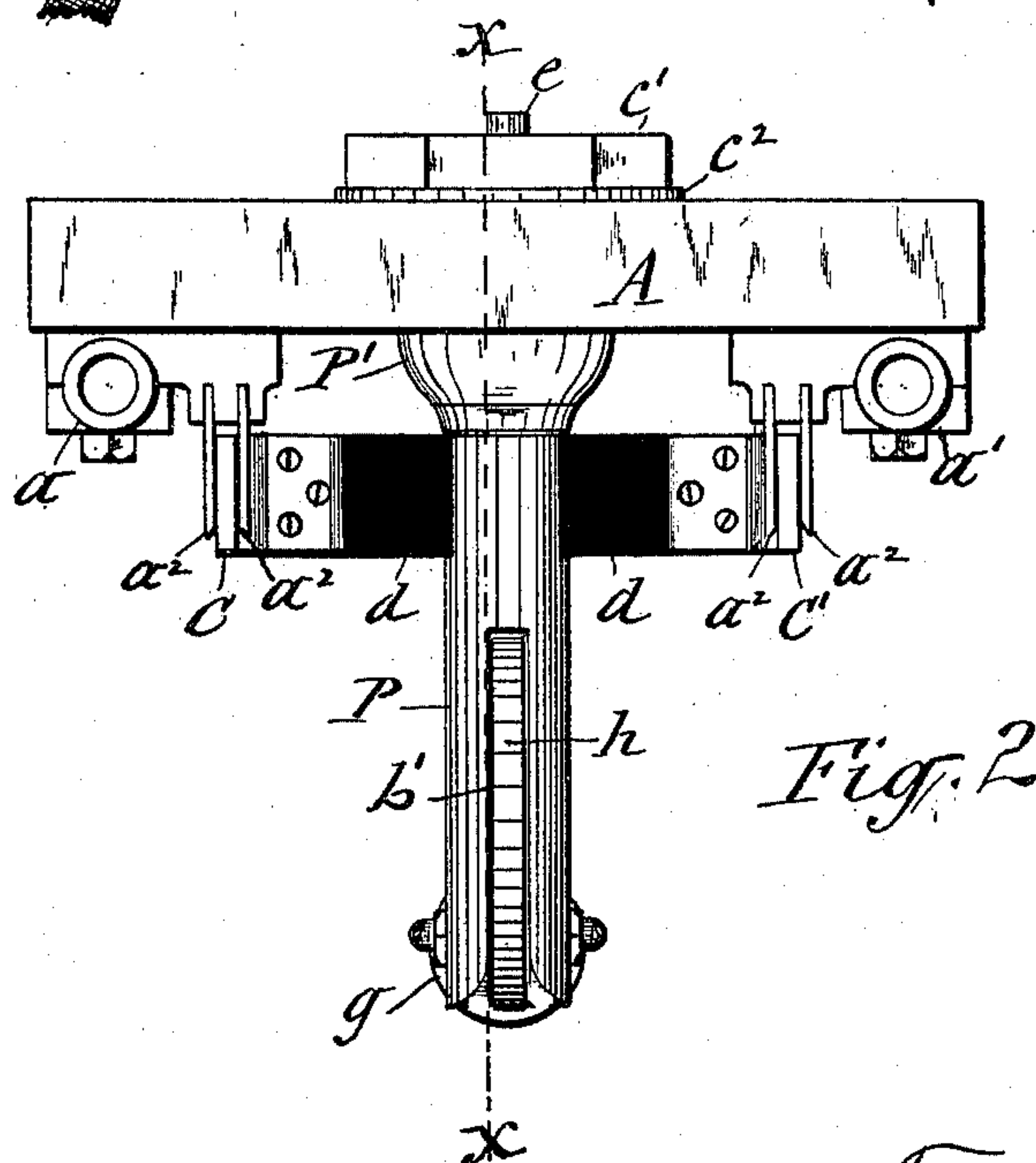
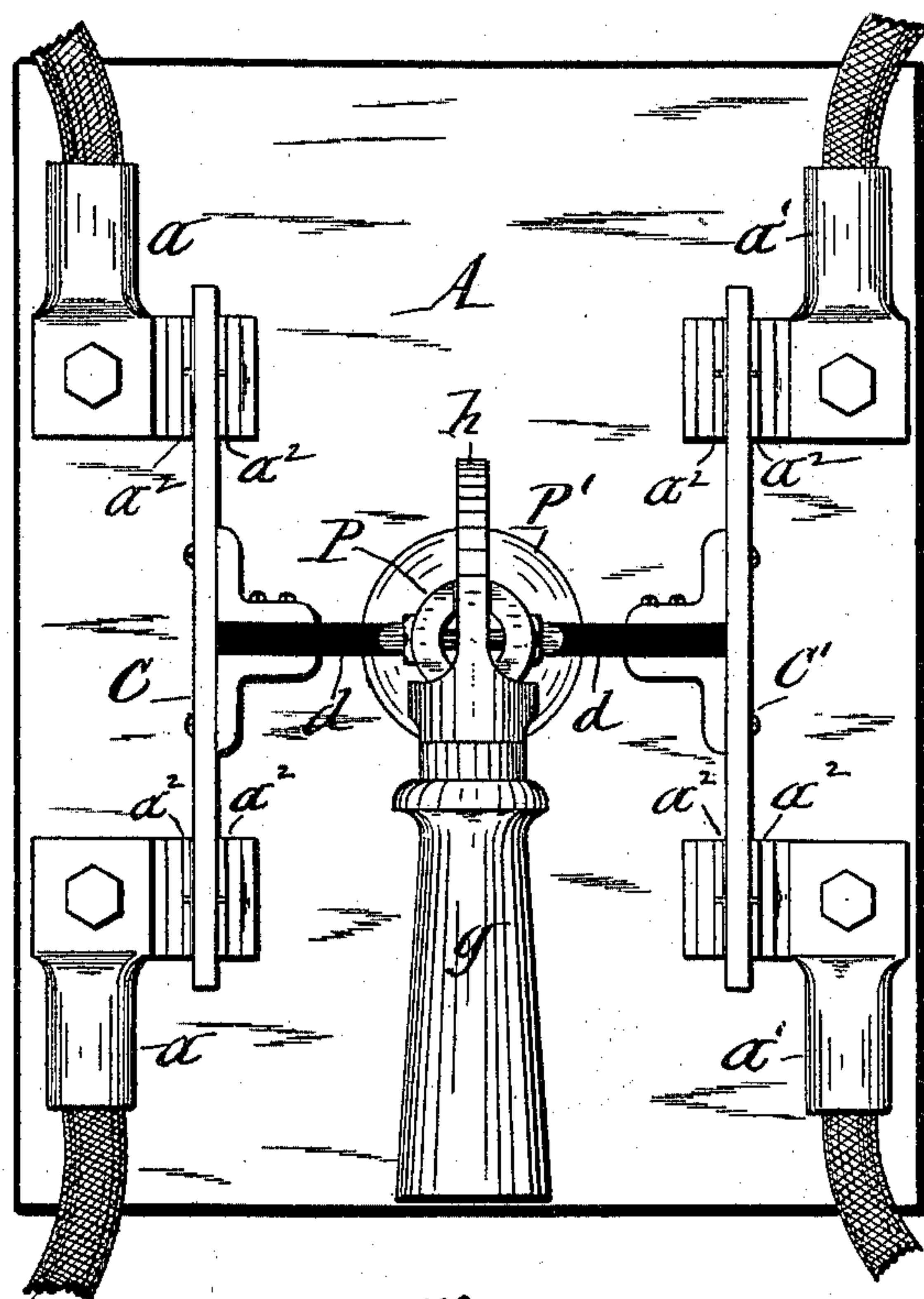
(No Model.)

2 Sheets—Sheet 1.

F. D. HALL.
ELECTRIC SWITCH.

No. 586,029.

Patented July 6, 1897.



WITNESSES :

H. B. Smith.

M. A. Luyken.

INVENTOR

Frank S. Hall

By E. Laasy

his ATTORNEY

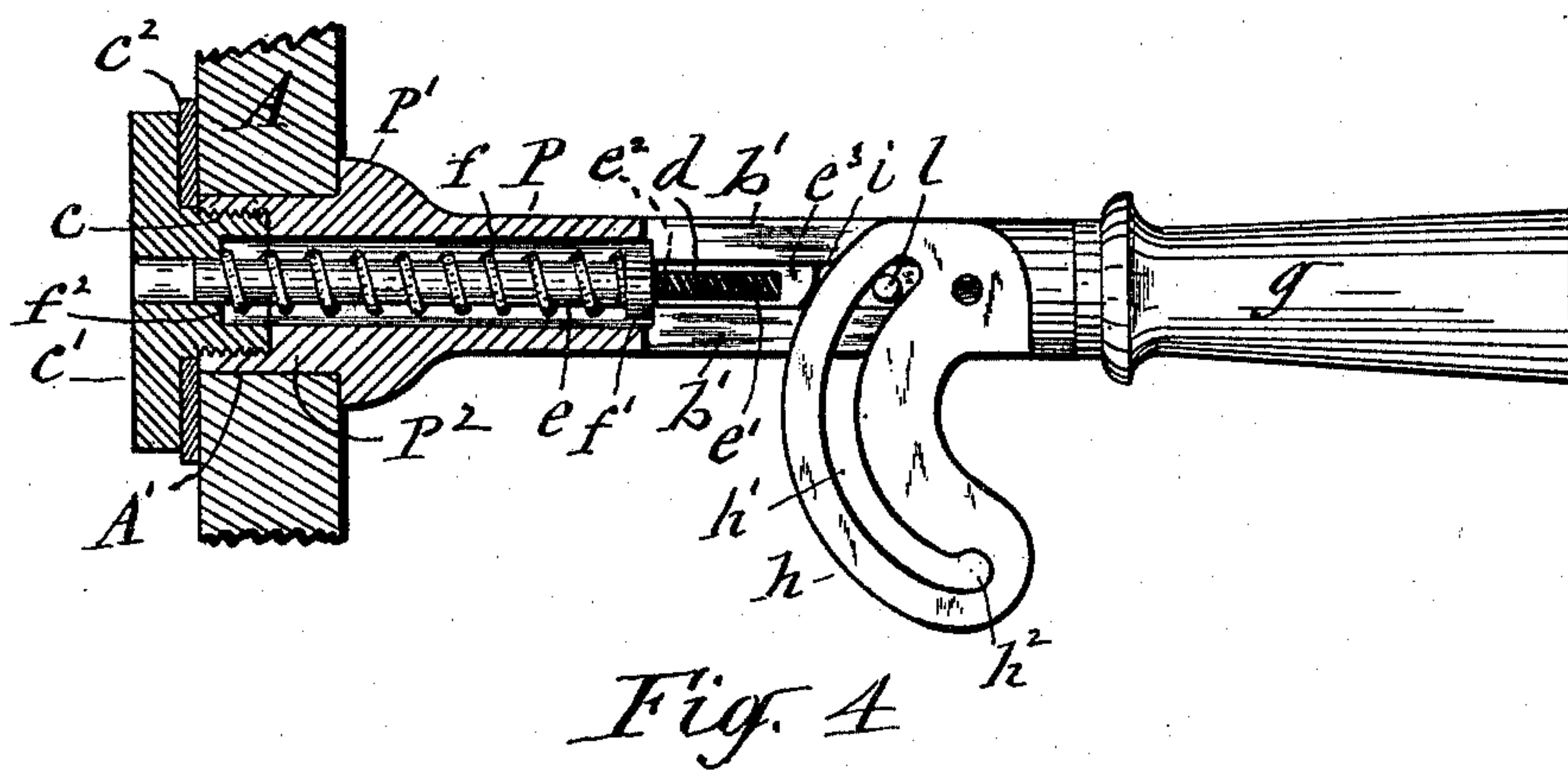
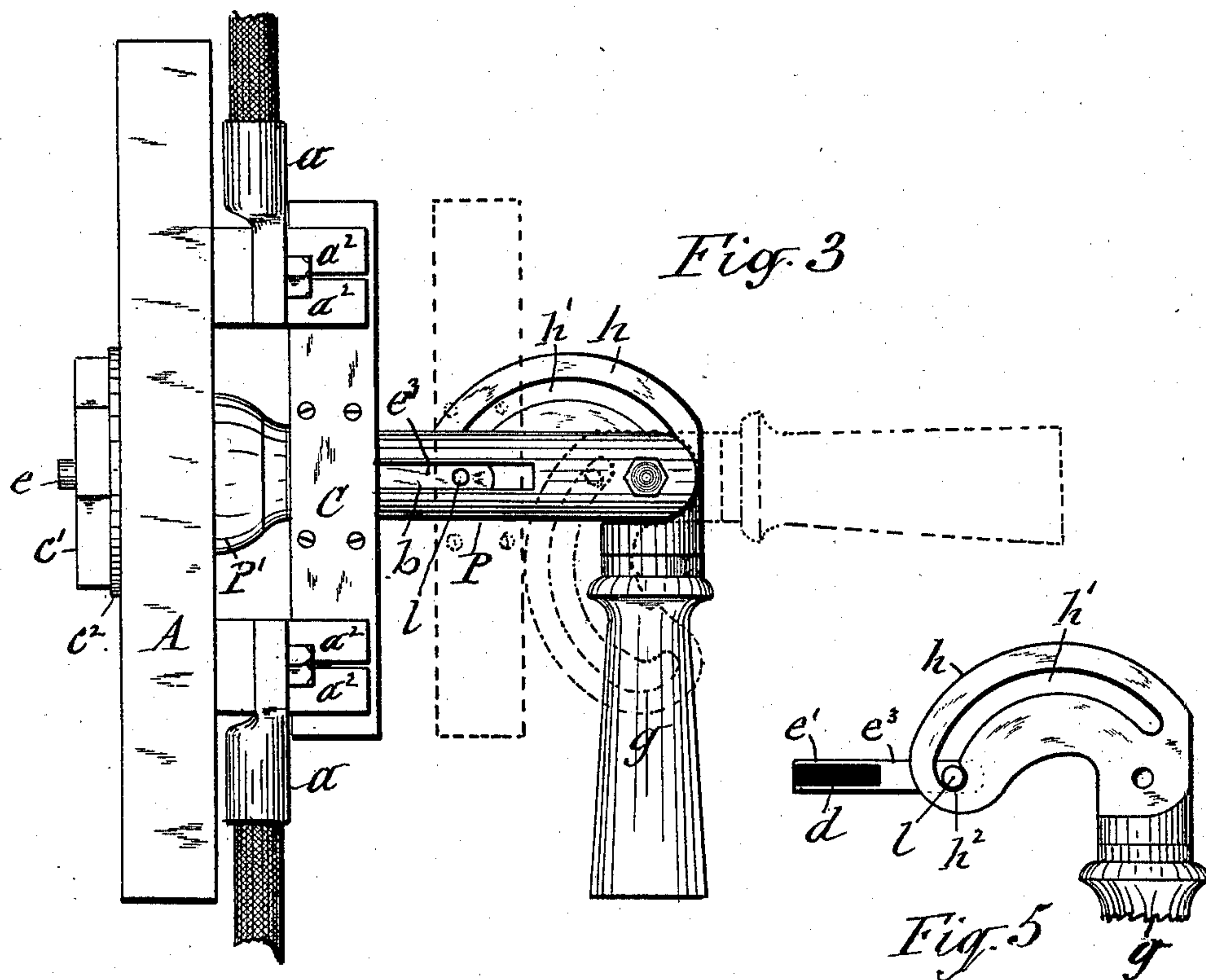
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UNITED STATES PATENT OFFICE.

FRANK D. HALL, OF SYRACUSE, NEW YORK.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 586,029, dated July 6, 1897.

Application filed March 8, 1897. Serial No. 626,359. (No model.)

To all whom it may concern:

Be it known that I, FRANK D. HALL, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric Switches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of electric switches in which the switch-plate is thrown into and out of contact with the poles or terminals by a movement of said plate in a plane at right angles to that of the poles or terminals.

The chief object of the invention is to provide a switch which shall be quick and positive in its action of making and breaking the circuit and guard against the liability of causing the sparking incident to slow and imperfect contacts of the switch-plate with the poles or terminals of the circuit; and to that end the invention consists in the novel construction and combination of the constituent parts of the switch hereinafter described, and set forth in the claims.

In the annexed drawings, Figure 1 is a face view of an electric switch embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a side view. Fig. 4 is a sectional view on the line X X in Fig. 2 with the hand-lever in position to allow the switch-plate to be held out of contact with the poles, and Fig. 5 is a detail view showing the position of the cam when the switch-plate is thrown into contact with the poles.

Similar letters of reference indicate corresponding parts.

A denotes the usual insulating-base of the switch.

$a a$ represent the poles or terminals, which may be secured to said base in any suitable manner and are provided with flexible metallic lips $a^2 a^2$, constituting the contacts between which the switch-plate enters in closing the circuit.

The switch herein represented is constructed for controlling two circuits, and for this purpose the base A has attached to it four poles $a a$ and $a' a'$, arranged in parallel pairs, as shown in Fig. 1 of the drawings.

C represents the switch-plate, which in my invention is sustained movably into and out

of contact with both poles simultaneously, and thus make and break the circuit quicker and more positively. This I prefer to accomplish by mechanisms shown in the annexed drawings and consists of a tubular post P, which projects from the face of the base A at a point central between the four poles $a a$ and $a' a'$ and at right angles to a plane passing through said poles.

The attachment of the post to the base, as shown in Fig. 4 of the drawings, consists of a collar P', formed on the foot of the post and resting on the face of the base A. A tubular extension P² is fitted tightly in a socket or orifice A' in the base and is screw-threaded internally and receives in it a screw c, provided with a head c', by which to turn the screw, so as to draw the post firmly onto the base. A washer c² is interposed between the said screw-head and face of the base. This post is provided with longitudinal slots $b b$ in diametric opposite sides and with longitudinal slots $b' b'$, which are in a plane at right angles to that of the slots $b b$.

Transversely through the slots $b b$ passes a plate d, of hard rubber or other suitable non-conducting material. This plate constitutes two arms, to the ends of which are fastened the switch-plates C and C', each of which extends in opposite directions from its respective supporting-arm, and is sustained parallel with the plane of the two poles.

In the portion of the post adjacent to the base A is a longitudinally-movable plunger e, which is provided with an extension c³, formed separate and provided with a slot e', through which the plate d passes. A spur e² on the end of the plunger proper engages the said plate at the center of its length, and thus confines the same in its position in relation to the axis of the post so as to carry the switch-plates C and C' equidistant from the post and compel said plates to travel in lines parallel with the post during the operation of the plunger.

f represents a spiral spring which surrounds a portion of the plunger and presses with its outer end on a collar f', affixed to the plunger, and with its opposite end on the bottom of the socket f², formed in the inner end of the screw c. This spring forces the

plunger outward and causes the switch-plates C and C' to be held normally out of contact with the poles.

To the outer end portion of the post P is pivoted a hand-lever *g*, which has integral with it or rigidly attached to it an eccentrically or elliptically curved cam *h*, which bears on a shoulder *i*, formed on the plunger extension *e*³. The said cam is provided with a slot *h'*, which is parallel with or curved to correspond to the curvature of the cam-face and is terminated with a more abrupt curvature *h*² in the free end of the cam, for the purpose hereinafter explained. To the plunger extension *e*³ is fastened a laterally-projecting pin *l*, which passes through the slot *h'*.

In the operation of the described switch the switch-plates C C' are held normally out of contact with the poles *a a* and *a' a'* by means of the spring *f* forcing the plunger *e* outward. To permit this movement of the plunger, the hand-lever *g* is to be turned to carry the cam *h* outward from the post P and thereby cause the plunger extension *e'* to be retracted by the engagement of the pin *l* with the slot *h'* of the cam, as shown in Fig. 4 of the drawings. When the circuits are to be closed, the hand-lever *g* is turned on its pivot to force the cam *h* inward, and in this movement the cam forces the plunger *e* toward the base A, and thereby causes the switch-plates C C' to be pressed into contact with all the poles *a a* and *a' a'* simultaneously, and when this is effected the pin *l* has entered the abruptly-curved end portion of the cam-slot *h'*, and thereby locks the switch in said position sufficiently to permit its being accidentally unlocked.

In the operation of breaking the circuit the movement of the plunger *e* is accelerated by the force of the spring *f*, and thus the switch-plates are withdrawn more quickly and positively from all the poles. Hence the liability of producing electric sparking is more effectually obviated.

What I claim as my invention is—

1. The combination, with the insulating-base and a plurality of poles secured to said base and disposed in pairs, of a tubular post projecting from the base between the pairs of poles, a plunger guided rectilinearly in said post, switch-plates carried by said plunger permanently parallel with the respective pairs of poles, a lever fulcrumed in the post,

an eccentrically-curved cam fixed to said lever and bearing on the end of the plunger to force the same toward the base, means for locking the lever to retain the switch-plates in contact with the poles, and a spring in the base of the post forcing said plunger outward, as set forth and shown.

2. The combination with the insulating-base and a plurality of poles secured to said base and disposed in parallel pairs, a tubular post projecting from the base between the pairs of poles and provided with longitudinal slots in opposite sides, a plunger sliding longitudinally in the interior of said post, two arms of insulating material fastened to the plunger and projecting through the longitudinal slots of the post, switch-plates attached to the free ends of said arms and sustained parallel with the respective pairs of poles, a lever fulcrumed on the post and having affixed to it a cam bearing on the outer end of the plunger to force the same inward, and a spring in the base of the post forcing the plunger outward, as set forth and shown.

3. The combination with the insulating-base and a plurality of pairs of poles secured to said base and disposed in parallel lines, a tubular post projecting from the base between the pairs of poles and provided with longitudinal slots in opposite sides, a plunger sliding longitudinally in said post, two arms formed in one piece of non-conducting material and secured at the center of its length to the plunger and extending through two of the diametrically opposite slots in the post, switch-plates fixed to the ends of said arms, a hand-lever pivoted to the free end portion of said post and having fixed to it a cam bearing on the end of the plunger and provided with a longitudinal slot curved to correspond to the curvature of the face of said cam and terminated with an abruptly-increased curvature, a pin fastened to an extension of the plunger and passing through the slot of the cam, and a spiral spring located in the post and forcing the plunger longitudinally outward, substantially as described and shown.

In testimony whereof I have hereunto signed my name this 6th day of March, 1897.

FRANK D. HALL. [L. S.]

Witnesses:

J. J. LAASS,
H. B. SMITH.