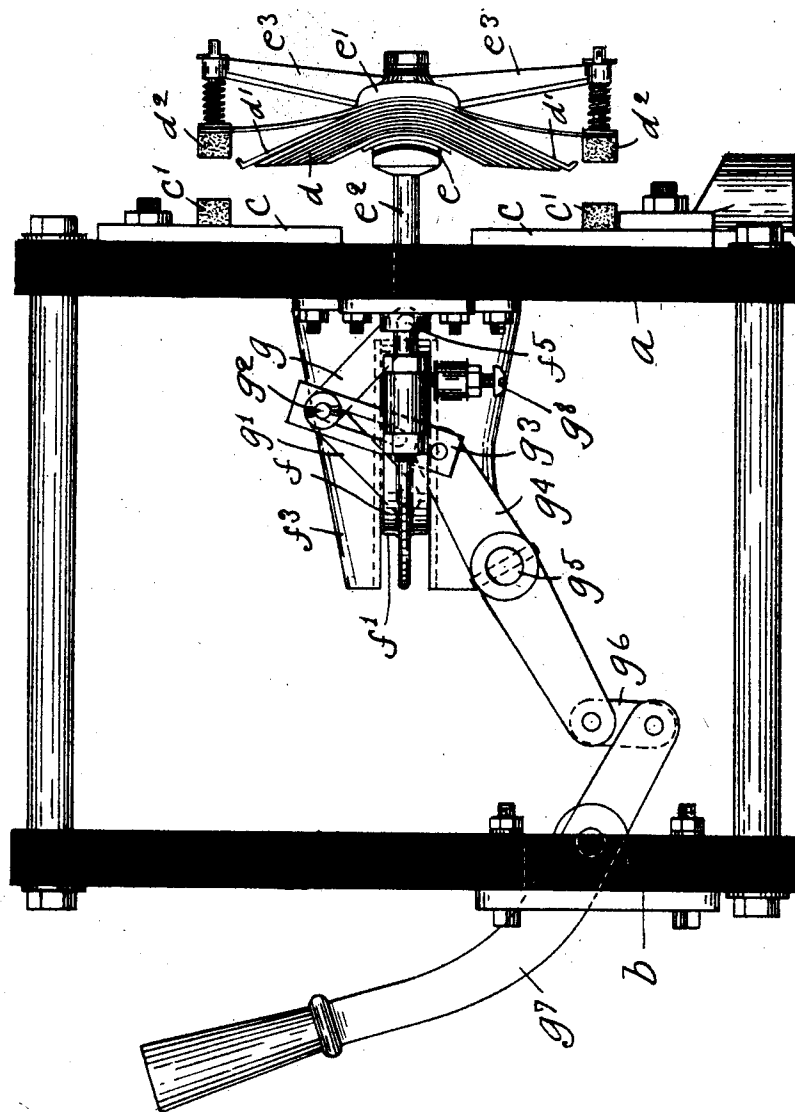


No. 797,065.

PATENTED AUG. 15, 1905.

B. S. LUTHER.
ELECTRIC SWITCH.
APPLICATION FILED APR. 4, 1904.

3 SHEETS—SHEET 1.



624.1

Witnesses:

H. B. Davis.
Maud M. Piper

Inventor:

Benjamin S. Luther
Eng. Hayes & Hannan
attys

No. 797,065.

PATENTED AUG. 15, 1905.

B. S. LUTHER.
ELECTRIC SWITCH.
APPLICATION FILED APR. 4, 1904.

3 SHEETS—SHEET 2.

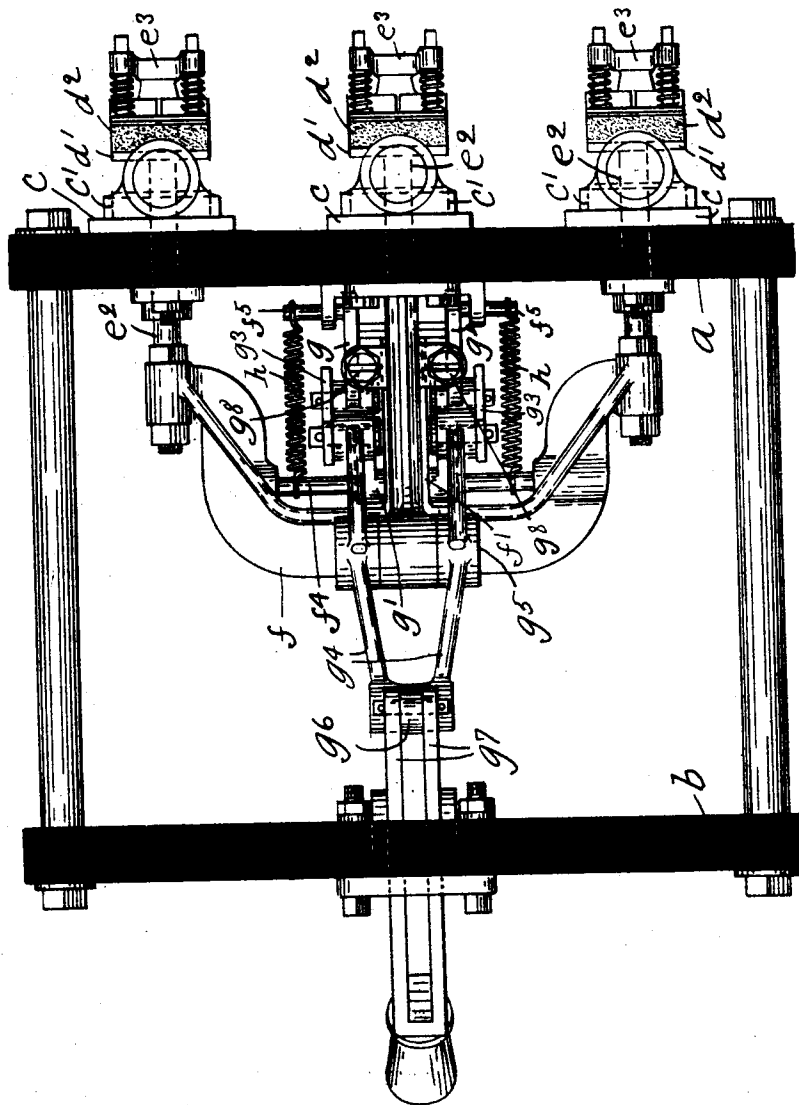


Fig. 2.

Witnesses:
H. B. Davis.
Maud M. Piper

Inventor:
Benjamin S. Luther
by Ayres & Harman
Attys

No. 797,065.

PATENTED AUG. 15, 1905.

B. S. LUTHER.
ELECTRIC SWITCH.
APPLICATION FILED APR. 4, 1904.

3 SHEETS—SHEET 3.

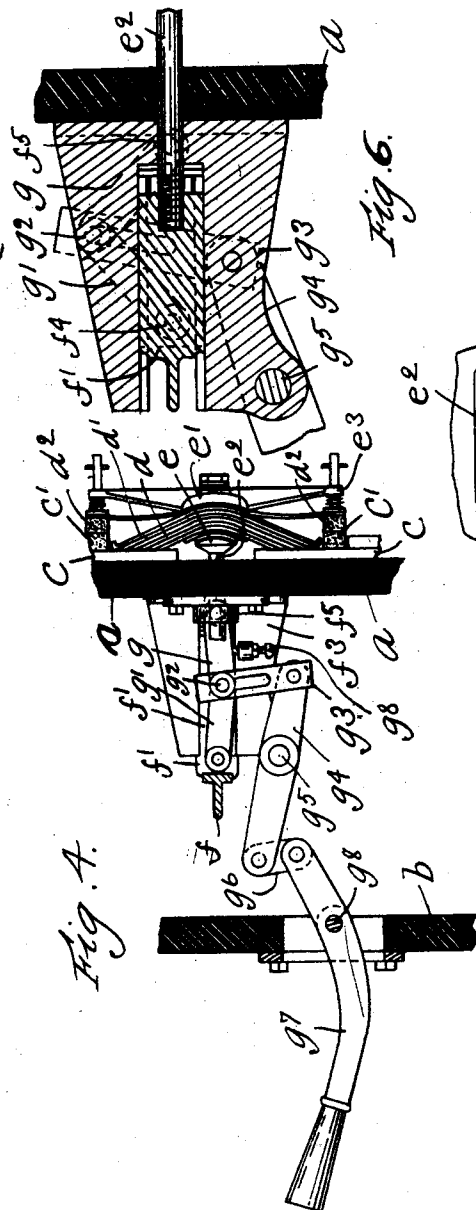


Fig. 4.

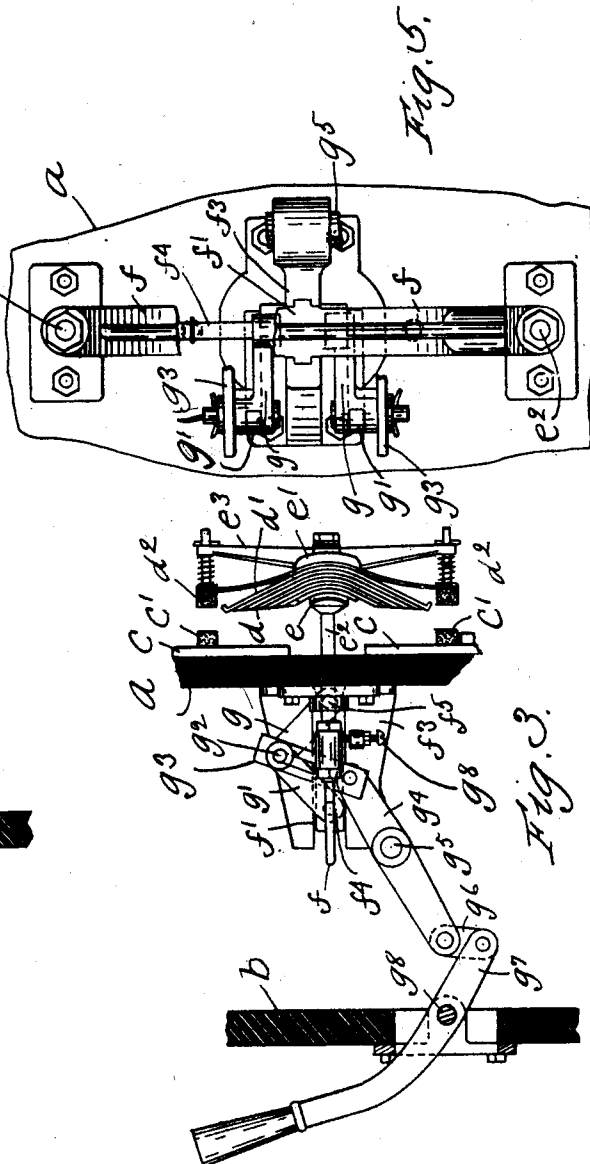


Fig. 15.

Fig. 3.

Witnesses:

H. B. Davis.

Hand M. Piper

Inventor:

Benjamin S. Luther.
By Ayres & Hamman
Attys.

UNITED STATES PATENT OFFICE.

BENJAMIN S. LUTHER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO CHASE-SHAWMUT CO., OF NEWBURYPORT, MASSACHUSETTS, A CORPORATION OF MAINE.

ELECTRIC SWITCH.

No. 797,065.

Specification of Letters Patent.

Patented Aug. 15, 1905.

Application filed April 4, 1904. Serial No. 201,619.

To all whom it may concern:

Be it known that I, BENJAMIN S. LUTHER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Electric Switches, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to electric switches especially adapted for heavy service, and has for its object to arrange the stationary contact-plates and the movable contact member or members on one side of a supporting-plate and to arrange the actuating mechanism for said movable contact member or members upon the opposite side of said plate and to connect the actuating mechanism with the movable contact member or members by a rod or rods, which pass through holes in said supporting-plate, whereby the movable contact member or members are drawn into engagement with the contact-plates by the actuating mechanism, and thereby held without unduly straining the means employed for securing the actuating mechanism to the supporting-plate; also, to improve the construction of the actuating mechanism for the movable contact members.

Figure 1 shows in side elevation an electric switch embodying this invention. Fig. 2 is an under side view of the electric switch shown in Fig. 1. Fig. 3 is a view of the essential elements of the switch in the position they will occupy when the switch is open. Fig. 4 is a view similar to Fig. 3, the parts being in the position they will occupy when the switch is closed. Fig. 5 is a plan view of the actuating mechanism for the switch. Fig. 6 is a sectional detail of a portion of the actuating mechanism.

a represents the supporting-plate for the members of the switch and for the switch-actuating mechanism, and *b* the supporting-plate for the switch-lever. Upon the rear side of the supporting-plate *a* a pair of stationary contact-plates *c* are secured, into engagement with which the movable contact member is drawn, and, as herein shown, said stationary contact-plates consist of a pair of flat metallic plates located a short distance apart, having secured thereto carbon blocks *c'*, and said contact member consists of a brush *d*, an intermediate plate *d'*, and auxiliary carbon blocks *d''*, yet so far as my invention is

concerned any other form of stationary and movable contact members may be employed. In the switch herein shown for the sake of illustrating my invention three pairs of stationary contact-plates are shown, and consequently three movable contact members are provided; but my invention is not limited to the number of pairs of contact-plates and movable contact members which may be employed.

The brush *d* and intermediate contact-plate *d'* are placed between two curved clamping-plates *e e'*, secured upon a rod *e''*, and from said curved plate *e'* arms *e'''* extend in opposite ways, which support at their extremities the spring-pressed carbon blocks *d''*. The rod *e''*, bearing the brush, intermediate plate, and auxiliary carbon blocks, is movable longitudinally to move the brush, intermediate plate, and carbon blocks successively into engagement with the stationary contact-plates. The rod *e''* extends through a hole in supporting-plate *a* and is connected to a yoke *f*, and, as herein shown, three such rods *e''* extend through the supporting-plate, which are attached to the yoke—one to the middle and the others to the extremities thereof. The yoke *f* has a guide-block *f'*, preferably at the point of attachment of the middle rod *e''*, which is adapted to slide in grooves formed in a supporting-frame *f''*, which is secured to the front of the supporting-plate *a*. The guideway formed by the grooves permits a free and unobstructed movement of the guide-block *f'*, and the yoke *f* is held firmly, yet is free to move the movable contact members of the switch into and out of engagement with the stationary contact-plates.

Between the arms of the yoke *f* and extending in parallelism with the crown thereof is a bar *f''*, which is rigidly secured at its ends to the arms of the yoke, and to the base of the supporting-frame *f''*, close to the supporting-plate *a*, pins *f'''* are rigidly secured, which project in opposite ways from said frame *f''*, being arranged in parallelism with the bar *f''*, and a toggle *g g'* is connected between each pin *f'''* and the bar *f''*, one member of each toggle being mounted loosely upon the pin and the other member being mounted loosely upon the bar, and the intermediate pivotal pins *g''* of said toggles are extended laterally in opposite ways and receive upon them slotted links *g'''*, the lower extremities

of which are pivotally connected to the ends of a two-armed lever g^4 , pivoted at g^5 to the supporting-frame f^3 at a point remote from the supporting-plate a , and the opposite end of said two-armed lever g^4 is connected by a link g^6 with a two-armed actuating-lever g^7 , pivoted at g^8 and having a handpiece by which it is operated.

As the handpiece is depressed the link g^6 will move the two-armed lever g^4 on its pivot g^5 and the slotted links g^3 g^3 will be drawn down, thereby acting to straighten the toggles and to move the yoke f in a direction away from the supporting-plate a and to move the switch members connected with said yoke into engagement with the stationary contact-plates. The toggles are moved in this manner until they are not only straightened, but also until they pass the longitudinal center, as shown in Fig. 4, whereupon they strike against adjustable stops g^8 , and when in such position they become locked and act to hold the movable contact member or members in engagement with the stationary contact-plates. When in the position shown in Fig. 4, the actuating-lever g^7 is free to be raised a distance equal to the length of the slots in the slotted links g^3 , and then said links will engage the intermediate pivot-pins of the toggles and will act to move said toggles in a homeward direction; but during such return movement as soon as said toggles pass the longitudinal center the yoke f will be moved quickly in a direction toward the supporting-plate a and the movable contact members will quickly disengage the stationary contact-plates. This quick action is due to the spring action of the movable contact-plates and to the action of two spiral springs h , which are connected to the pins f^5 and bar f^4 .

When closing the switch, the base of the supporting-frame f^3 , bearing upon the supporting-plate, serves as an abutment for resisting the end thrust of the toggles, and the pivot of the two-armed lever on the said supporting-frame at a point remote from its base serves to resist the thrust of the means employed for actuating said toggles, and the pull upon the movable contact members is resisted by the supporting-plate a , and the pressure of said contact members upon the contact-plates is resisted by said supporting-plate a , said forces working toward or in opposition to each other, being thereby equalized, and no severe strain is brought upon the means employed for securing the actuating mechanism in position.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric switch, a supporting-plate having a hole through it, stationary contact-plates on one side of said supporting-plate, a movable contact member, a rod to which said member is secured which passes through said

hole, a supporting-frame at the opposite side of said supporting-plate, a toggle connected at one end to said rod, and at the other end to said supporting-frame, a slotted link connected to said toggle and a lever pivoted to said supporting-frame which is connected to said link, substantially as described.

2. In an electric switch, a supporting-plate having a hole through it, stationary contact-plates on one side of said supporting-plate, a movable contact member, a rod to which said member is secured which passes through said hole, a supporting-frame at the opposite side of said supporting-plate, a toggle connected at one end to said rod, and at the other end to said supporting-frame, a spring also connected at one end to said rod and at the other end to said supporting-frame, a slotted link connected to said toggle and a lever pivoted to said supporting-frame which is connected to said link, substantially as described.

3. In an electric switch, a supporting-plate having a plurality of holes through it, stationary contact-plates on one side of said supporting-plate adjacent each hole, a plurality of movable contact members, rods to which said members are secured which pass through said holes, a yoke to which said rods are connected, a supporting-frame at the opposite side of said supporting-plate, a toggle connected at one end with said rods and at the other end with said supporting-frame, a slotted link connected to said toggle and a lever pivoted to the supporting-frame which is connected to said link, substantially as described.

4. In an electric switch, a supporting-plate having a plurality of holes through it, stationary contact-plates on one side of said supporting-plate adjacent each hole, a plurality of movable contact members, rods to which said members are secured which pass through said holes, a yoke to which said rods are connected, a supporting-frame at the opposite side of said supporting-plate, a toggle connected at one end with said rods, and at the other end with said supporting-frame, a spring also connected at one end to said rods and at the other end to said supporting-frame, and means for operating said toggle, substantially as described.

5. In an electric switch, a supporting-plate having a hole through it, stationary contact-plates on one side of said supporting-plate, a rod passing through said hole, a movable contact member attached to said rod, a supporting-frame at the opposite side of said supporting-plate, a toggle also located at the opposite side of said supporting-plate, one end of which is connected to said rod and the other end to said supporting-frame, a lever pivoted to said supporting-frame, a link connecting said lever with the toggle, and a pivoted actuating-lever connected with said pivoted lever, substantially as described.

6. In an electric switch, a supporting-plate

having a hole through it, stationary contact-plates on one side of said supporting-plate, a rod passing through said hole, a movable contact member attached to said rod, a supporting-frame at the opposite side of said supporting-plate, a toggle also located at the opposite side of said supporting-plate one end of which is connected to said rod and the other end to said supporting-frame, a lever pivoted to said supporting-frame, a slotted link connecting said lever with the toggle, and a pivoted actuating-lever connected with said pivoted lever, substantially as described.

7. In an electric switch, a supporting-plate having a hole through it, stationary contact-plates on one side of said supporting-plate, a rod passing through said hole, a movable contact-plate attached to said rod, a supporting-frame at the opposite side of said supporting-plate having a guideway, a guide-block on the rod movable in said guideway, a toggle connected at one end with said rod, and at the other end with said supporting-frame, a lever pivoted to said supporting-frame, a slotted

link connecting said lever with said toggle, and a pivoted actuating-lever connected with said pivoted lever, substantially as described.

8. In an electric switch, a supporting-plate having a hole through it, stationary contact-plates on one side of said supporting-plate, a rod passing through said hole, a movable contact-plate attached to said rod, a supporting-frame at the opposite side of said supporting-plate having a guideway, a guide-block on the rod movable in said guideway, a toggle connected at one end with said rod and at the other end with said supporting-frame, a spring connected at one end with said rod and at the other end with the supporting-frame, and means for operating said toggle, substantially as described.

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

BENJAMIN S. LUTHER.

Witnesses:

B. J. NOYES,

H. B. DAVIS.