Sept. 29, 1925. 1,555,000

W. J. GIBBONS

ELECTRIC SWITCH

Filed March 10, 1924

Fig. 1.

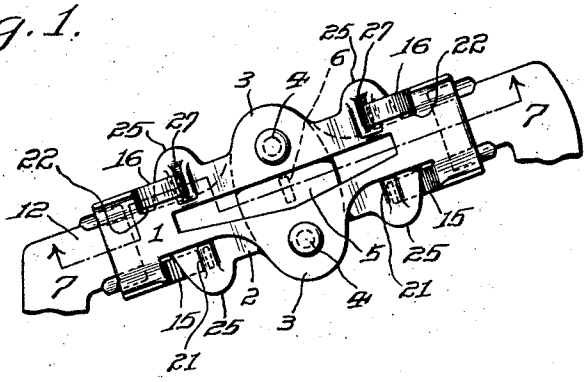


Fig. 2.

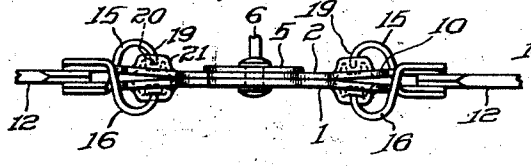


Fig. 3.

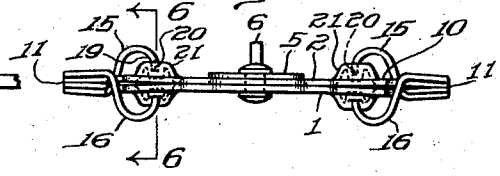


Fig. 4.

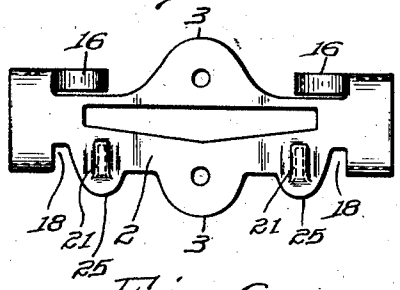


Fig. 5.

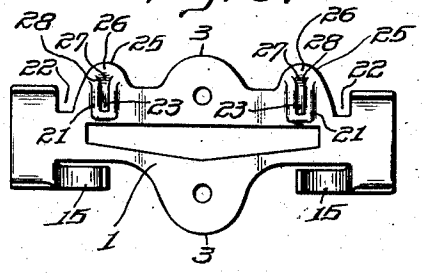


Fig. 6.

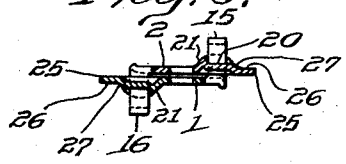
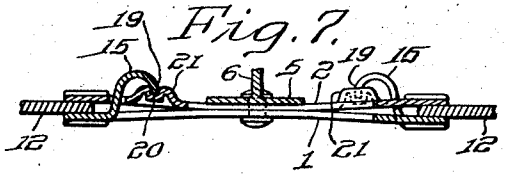


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

Application filed March 10, 1924. Serial No. 697,987.

To all whom it may concern:

Be it known that I, WILLIAM J. GIBBONS, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improvement in Electric Switches, of which the following is a specification.

My invention relates to electric switches and it has for its general object to provide a novel construction of switch comprising a couple of substantially straight plates arranged and secured in parallel and contactual relation with respect to each other.

It is also an object of the invention to provide a switch of the character indicated in which the inner edge portions of the opposite ends of the said plates are normally in contact with each other while the portions thereof intermediate said ends and the central portion of the said plates are separated from each other.

A still further object of the invention is to provide a switch comprising two plates of the character indicated, which plates are provided with means near their opposite ends for yieldingly resisting the separation of the end portions of the said plates, and the resistance of which increases as they are separated by the entrance of the stationary contacts between same which co-operate with the said switch.

To these and other ends the invention comprehends the construction as hereinafter fully described in the detailed description, as particularly pointed out in the claims, and as shown in the drawing in which I have illustrated one convenient form of embodiment of the same. However it is to be understood that the invention is susceptible of mechanical embodiment in other forms of construction than that shown and that changes in the details of construction may be made within the scope of the claims without departing from said invention.

In the drawing:

Fig. 1 is a view in side elevation of a switch constructed in accordance with my invention and in which the opposite ends thereof are shown in engagement with the stationary contacts of a switch structure;

Fig. 2 is a top plan view of the switch and the stationary contacts shown in Fig. 1, the latter being in engagement with the opposite ends of the said switch;

Fig. 3 is a similar view, the stationary contacts being omitted;

Fig. 4 is a view in elevation of the front side of the rear plate of the switch;

Fig. 5 is a view in elevation of the front or outer side of the front plate of the switch;

Fig. 6 is a transverse sectional view taken on the line 6—6, Fig. 3; and

Fig. 7 is a longitudinal sectional view taken on the line 7—7 Fig. 1.

Referring to the drawing: 1 and 2 designate, respectively, the spring-plate members of the switch, each of which is provided with central projections as indicated at 3 to provide sufficient room for rivets 4 employed for securing the said plates together.

A relatively narrow transversely extending strip 5 is secured by the said rivets upon the rear side of the switch consisting of the plates 1 and 2. A fulcrum member partially indicated at 6 is secured by soldering or otherwise to the strip 5 intermediate the rivets 4. By means of the said fulcrum member the switch blades comprising the plates 1 and 2 are oscillatably supported in the switch structure. Such switch structure is not shown, however, because it forms no part of my present invention.

It will be observed that the central portions of the plates 1 and 2 are held in close contact with each other, and that the portions of the plates intermediate the rivets 4 and the outer ends thereof are slightly bowed outwardly as indicated at 10 in Fig. 3, and that the outer ends of the said plates are in contact.

The plates 1 and 2 are of spring metal and the resiliency thereof, in the construction shown, is sufficient to hold the outer ends in contact, as shown at 11 in Fig. 3. It is desirable, however, that additional means be provided for more firmly holding the ends in contact and for offering greater resistance to the separation thereof upon the entry of the stationary contacts 12 between the same than would be the case without such additional means. In the construction, as shown, said additional means comprises spring-hook members 15 and 16 connected with the front and rear plates, respectively, adjacent their opposite ends, which hooks extend inwardly. Each of these hooks consists of integral relatively narrow strips formed by cutting away portions of the metal of said plates at the edges upon opposite sides of the central portion thereof. In the construction, as shown, the hooks 15 upon the front plate

1 are connected with the lower edge thereof while the hooks 16 upon the rear plate are connected with the upper edge thereof. The hooks 15 upon the front plate are formed by bending the relatively narrow strips, previously referred to, transversely of the plates and extending the same through notches 18 in the lower edge of the plate 2 adjacent the opposite ends thereof a distance beyond the rear outer side of the said plate and then inwardly toward the middle of the said plates, and then in reverse directions transversely of the said plates as indicated at 19. The inner free ends of the hooks 15 engage in square-shouldered or rectangular-shaped notches 20 formed in elevated or rearwardly projected portions 21 upon the rear side of the rear plate 2.

The hooks 16 upon the rear plate 2 are formed by extending the strips thereon, previously referred to, transversely of the plates 1 and 2 through slots 22 upon the upper edge of the front plate 1 adjacent the opposite ends thereof. The said strips are extended forwardly and then inwardly toward the middle of the said plates and then in a reverse direction transversely of the said plates, the inner free ends thereof being in engagement with the square or rectangular-shaped notches 23 formed in elevations or projections upon the front side of the said front plate 1. It will be seen that as the outer end portions of the plates 1 and 2 are separated by the entry between the same of the stationary contacts 7 the springs 15 and 16 are placed under tension, and that by reason of the square or rectangular-shape of the notches 20 and 23 the ends of the said hooks are retained therein. Such retention of the ends of the hooks within the said notches as the ends of the plates are separated tends to increase the tension imposed upon the hooks 15 and 16 and the resistance offered thereby against such separation.

In order to facilitate the placing of the hooks 15 and 16 within the notches 20 and 23, respectively, when said plates are assembled, I have provided projections 25 which extend outwardly from the said plates in general alinement with the notches. The outer ends of the said projections terminate in flat ledge-like portions 26 upon which the ends of the said hooks 15 and 16 rest in the initial step of assembling the said plates. The said plates having been placed in such relation to each other that the ends of the hooks rest upon the said ledge-like portions, they are then slid over each other into final position. During such movement the hooks are guided up the inclines at 27 between converging sides 28 upon opposite sides of the said inclined surfaces 27 and during such movement are placed under tension. It will be seen, therefore, that means are provided whereby the assembling of the plates with the hooks 15 and 16 in position within the notches 20 and 23 is greatly facilitated.

It will be seen that by my invention an oscillatable electric switch which is adapted for use in the various types of switch structures in which the movable element of the switch is adapted to be snapped or quickly moved from one position to another, either into or out of contact with stationary contact members, is provided.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. An oscillatable electric switch comprising plates secured together in substantially parallel relation with respect to each other the outer ends thereof being separable, and yielding resilient means carried by each of said plates adjacent its opposite ends and engaging the outer side of the other plate.

2. An electric switch comprising spring plates secured together at their middle portions and arranged in substantially parallel relation with respect to each other and each of the said plates being provided with notches upon its outer side a distance from its opposite ends and also with resilient hooks which hooks extend inwardly from points adjacent the said opposite ends and the inner free ends of the hooks of one plate engaging the notches of the other plate.

3. An electric switch comprising plates of spring-metal secured together at their middle portions and arranged in face to face relation with respect to each other, the portions of said plates intermediate their point of connection and their outer ends being bowed outwardly and each of the said plates being provided with outwardly extending elevations at points a distance from its opposite ends and inwardly extending notches in the said projections and each of the said plates being also provided with hooks which extend inwardly from points adjacent their opposite ends, the inner free ends of the hooks of one plate being in engagement with the notches in the other plate.

4. An electric switch comprising plates secured together at their middle portions and arranged in face to face relation with respect to each other, the outer ends of which are normally in contact with each other, and each of the said plates being provided with notches upon their outer sides located a distance from the opposite ends thereof, one end of each of which notches is open, inclined portions leading from points adjacent the edge of each of said plates into the said open ends and ledges beyond the outer ends of said inclined portions and each of the said plates being provided with hooks at one edge which hooks extend in-

wardly from points adjacent the opposite ends of the said plate and the hooks of each plate extending transversely of the said plates across the other plate and then inwardly and in reverse direction, the inner free ends thereof being in engagement with the said notches.

5. An electric switch, the portions thereof intermediate their middle portions and their ends being bowed outwardly, the outer ends of the said plates being normally in contact with each other and each of said plates being provided with elevations a distance from their opposite ends which elevations extend outwardly and each of which is provided with a rectangular-shaped notch the outer end of which is open, and tapered grooves leading to the open ends of said notches and each of said plates being provided with resilient spring hooks connected thereto at points adjacent its outer ends, the hooks of each plate extending transversely of said plates and across the same, then inwardly and in reverse direction, the inner free ends of the hooks upon one plate engaging the notches of the other plate.

6. An electric switch comprising plates secured together at their middle portions and arranged in face to face relation with respect to each other, the outer ends of which are normally in contact with each other, and each of the said plates being provided with notches upon their outer sides located a distance from the opposite ends thereof, one end of each notch facing toward an adjacent edge of its plate and being open and the said plate being provided with inclined portions leading from points adjacent the edge of the said plates into the open ends of the said notches, and each of said plates being also provided with ledges beyond the outer ends of said inclined portions and each of said plates being provided with hooks adjacent its opposite ends which hooks extend inwardly of the said plates and the hooks of one plate extending transversely across the other plate and then inwardly in a reverse direction, the inner free end of each hook being seated in one of the notches upon the outer side of the other plate, substantially as described.

7. An electric switch comprising plates secured together at their middle portions, the portions of said plates between the middle portions and the outer ends thereof being bowed outwardly and the outer ends of said plates being normally in contact with each other and each of said plates being provided with projections located on its outer side short distances from its opposite ends, each of which projections is provided with a notch the outer end of which is open and the said plates each being provided with tapered grooves leading to the open ends of said notches and also being provided with resilient spring hooks connected thereto at points adjacent its opposite ends, the hooks of one plate extending transversely across the other plate then inwardly and in reverse direction, the inner free ends of the hooks of one plate engaging the notches of the other plate, the said free ends being guided and directed into said notches by the said grooves, substantially as described.

8. An electric switch comprising plates arranged and secured together in face to face relation to each other, each of which plates is provided with notches in one edge, one of which is adjacent one end and the other of which is adjacent the opposite end, and each of which is provided with spring hooks at its opposite edge, one of which hooks is adjacent one end and the other one of which is adjacent the opposite end, the hook of one plate extending through the notches in the adjacent opposing edge of the other plate and then inwardly and transversely of the planes of said plates to contact with the outer side of said other plate.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 6th day of March, A. D. 1924.

WILLIAM J. GIBBONS.