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C. E. ANDERSON

1,657,338

ELECTRIC SWITCH

Filed Jan. 23, 1925

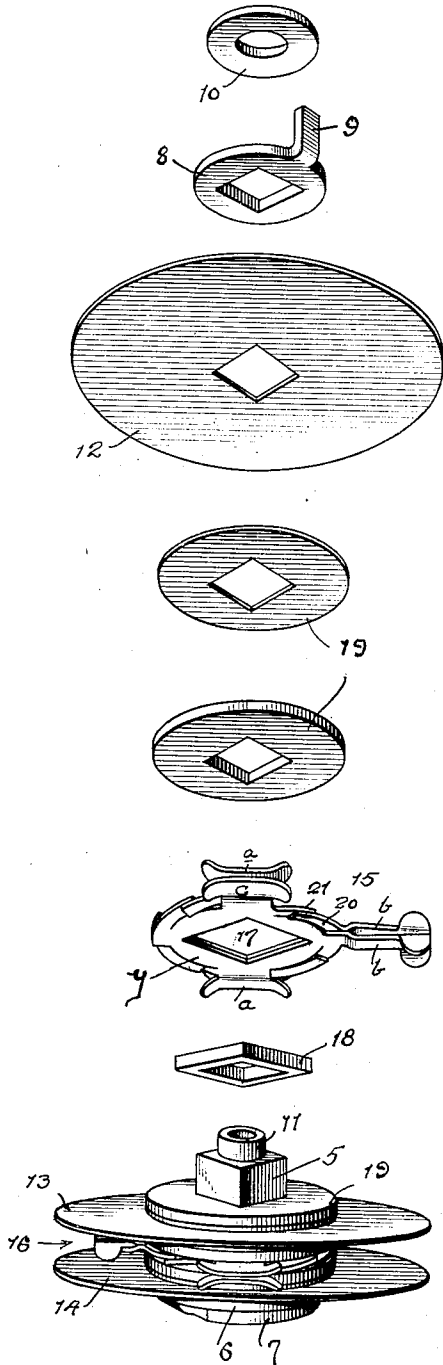


Fig. 2.

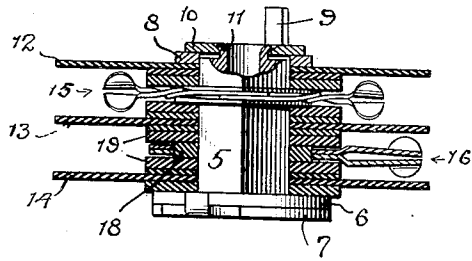


Fig. 3.

Fig. 1.

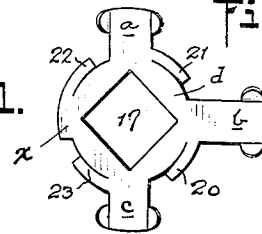
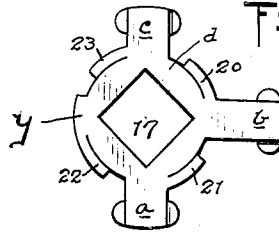


Fig. 4.



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ELECTRIC SWITCH.

Application filed January 23, 1925. Serial No. 4,325.

My invention relates to electric switches, and particularly to switches of the rotary snap type. The object of my invention is to provide a switch blade unit of improved construction and mounting in a switch of this character.

In the accompanying drawings—

Fig. 1 is a dropped perspective of the switch blade assembly unit of a rotary snap switch, which embodies my invention in one form;

Fig. 2 is a broken section through the unit with parts assembled;

Figs. 3 and 4 are respectively plan and inverted plan views of the pair of leaves which constitute one of the switch blades.

The details of the switch construction other than the blade unit and its mounting are not illustrated inasmuch as they do not enter into my invention. The blade and its carrier as shown may, for instance, be used in a reversing heater switch of the general type illustrated in the patent to Carlson No. 1,506,563, August 26, 1924.

The blade carrier comprises a hollow post 5 of noncircular, preferably rectangular, outline in plan, which with its associated elements, forms an assembly unit of the switch structure. At the lower end of the post is a base flange 6 and an associated escapement plate 7 adapted for cooperation with an escapement mechanism of any suitable type operated as usual by the rotary spindle (not shown) which passes down through the central opening in the post 5. At the upper end of the post is a driving plate 8 with upstanding lug 9 adapted to be embraced by the opposite ends of the switch driving spring (not shown). The retaining washer 10 rests upon the driving plate 8, while the neck 11 at the upper end of the post 5 is spread above the washer 10 to rivet the parts together. The post and its associated members thus form a self-contained assembly unit.

Between the usual insulating discs 12, 13 and 14, suitably spaced apart on the post 5, are arranged spring contact blades 15 and 16, the central apertures 17 of which are of sufficient size to accommodate insulating bush-

ings 18 interposed to effectively insulate the blades from the post. It will be noted that the thickness of the bushing 18 exceeds the combined thickness of the superposed leaves x and y (Figs. 3-4) of which each blade is formed. A certain vertical play of each blade on its bushing 18 is thus possible. Insulating spacers 19, of greater diameter than the bushing 18, are interposed between the latter and the adjacent discs 12-13 or 13-14, and thus form, with the discs and bushings, a rigid central column of insulation between the inner margins of the blades and the post, while the discs prevent arcing between the blades or between the blades and contacts as the switch is thrown to open circuit position.

It has heretofore been customary in the manufacture of switch blades of this general type to rivet the blade leaves x and y together, thus forming a rigid connection between the leaves at a point spaced outward from the margins of the post hole 17. The rigid connection thus established, objectionably limits the effective spring area of the leaves to the marginal area of the blade body, or to the blade wings outward of the riveted connection. Inasmuch as the terminal contacts of the switch are rigid and often relatively thick, it is highly desirable to increase as much as possible the effective spring area of the blade leaves, so that the latter, as they spread to embrace the contact, are not permanently deformed or set by the spreading strain imposed on them.

Furthermore, the switch contacts are mounted upon an insulating base which is commonly of porcelain, and is subject to variable shrinkage on firing, with the result that the contact levels are often inaccurately located. Unless the switch blades on the post 5 have a certain "float" so that they accommodate themselves to the levels of the fixed contacts, the blades are apt either to fail to embrace the fixed contacts between the blade leaves and thus derange the switch, or to be so deformed by the contact that they fail to make the desired wiping engagement with both the upper and lower faces of the contact.

My invention provides a spring switch blade, the leaves of which have the utmost possible freedom to part for the accommodation of the fixed contact therebetween, while at the same time they are so united that they float together as a unit on the carrier post to accommodate the blade to the level of the fixed contact.

In the form here shown each blade has a plurality of contact-engaging spring arms *a*, *b*, *c* extending outward from a central body portion *d*. Integral with each leaf are arcuate flanges 20, 21, 22 and 23, formed circumferentially outside the body area *d* of each leaf. The free ends of the arcuate flanges are slightly offset from the plane of the leaf, and the flanges are of such extent that when the two leaves which constitute a blade are superposed (in reversed relation) and oppositely rotated with respect to each other, to bring the several arms *a*, *b*, *c* respectively into register, the free ends of the arcuate flanges interlock (Fig. 1). The leaves are thus united into a blade unit, but without a rigid connection such as is afforded by the usual rivets. Inasmuch as the leaves are held against relative rotation when assembled on the post 5, by reason of the outline of the post and the corresponding outline of the aperture 17, the arcuate flanges remain engaged and maintain the blade leaves juxtaposed, while at the same time permitting not only the "float" of the blade on the spindle to accommodate itself to the fixed contact level, but also the flexure of the arms *a*, *b*, *c* of each leaf, and of the adjacent portions of the body *d*, completely inward to the post 5, to accommodate the blade leaves to the thickness of the fixed contact without danger of imparting a permanent set to the leaves. The utmost flexibility of the blade arms is thus attained, while at the same time the two leaves of each blade are maintained in properly juxtaposed position on floating displacement of the blade as a whole.

Manufacture of a blade of this character is simple and economical, since the leaves of each blade may be identical, one being reversed in position with respect to the other on assembly. The number of arms *a*, *b*, *c* may be greater or less than that shown, and the arcuate flanges may be located at other points while still accomplishing the same results. For example, the flanges on one leaf may obviously be replaced by slits or shoulders through or beneath which the flanges on the other leaf pass. Even a loose rivet might be employed. But I prefer the construction shown since a riveting operation is rendered unnecessary and both leaves may be formed by the same press die.

The construction affords (1) a blade full floating on the post 5 to accommodate itself to the level of the fixed contact; (2) the ut-

most flexibility of the blade leaves to prevent deformation or permanent set; (3) assured and even engagement of the blade leaves with both the upper and lower faces of the fixed contact. The interengagement of the arcuate flanges 20, 21, 22 and 23 of the respective leaves of a blade is readily effected by the operative on assembly, and the frictional engagement between the flanges maintains the leaves in proper relation (see Fig. 1) so that they may be freely handled as a subsidiary assembly unit when assembling the parts on the post 5.

With the understanding that the construction shown constitutes only an illustrative embodiment of the underlying thoughts which I claim as my invention, I claim—

1. In a rotary snap switch, a switch blade comprising a pair of superposed leaves with registering contact-engaging wings, and slidably interengaged means for the respective leaves connecting said leaves together to form a blade unit, the leaves of which are free to separate at their point of connection.

2. In a rotary snap switch, a switch blade comprising a pair of superposed leaves with registering contact-engaging wings, and means integral therewith affording a spring connection between the leaves to form a blade unit.

3. In a rotary snap switch, a switch blade comprising a pair of superposed leaves with registering contact-engaging wings, and means integral with the leaves for connecting the same into a blade unit.

4. In a rotary snap switch, a switch blade comprising a pair of superposed leaves with registering contact-engaging wings, and means operative, on relative rotation of the leaves in superposed position to afford a connection therebetween.

5. In a rotary snap switch, a switch blade comprising a pair of superposed leaves with registering contact-engaging wings, and means operative, on relative rotation of the leaves in superposed position, to afford a loose connection therebetween.

6. In a rotary snap switch, a switch blade comprising a pair of superposed leaves with registering contact-engaging wings, and means operative on relative rotation of the leaves in superposed position, to afford a spring connection therebetween.

7. In a rotary snap switch, a blade carrier post and a blade unit mounted to float thereon, said blade unit comprising superposed leaves connected together with freedom to separate at the point of connection, said leaves being effectively held in register only by their engagement with the carrier post.

8. In a rotary snap switch, a blade carrier post of non-circular cross section and a blade unit mounted to float thereon, said blade unit comprising superposed resiliently-con-

nected leaves apertured to the shape of said post and held in register by their engagement with the latter.

9. In a rotary snap switch, a blade carrier
5 post of non-circular cross section, and a blade unit mounted to float thereon, said blade unit comprising a pair of leaves apertured in register to fit said post, and having inter-

connecting means engaged by the relative rotation of said leaves to bring into register 10 the non-circular apertures within which the post is accommodated.

In testimony whereof I have signed my name to this specification.

CARL ERIC ANDERSON.