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ELECTRIC SWITCH.
APPLICATION FILED FEB. 28, 1918.

1,408,097. Patented Feb. 28, 1922.

Fig. 1.

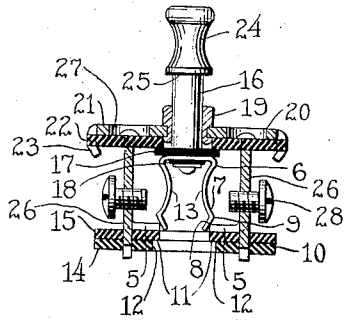


Fig. 2.

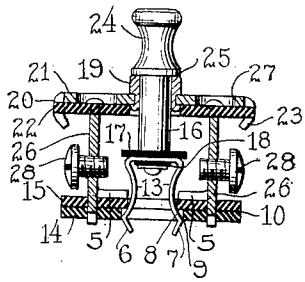


Fig. 3.

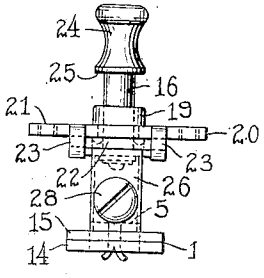
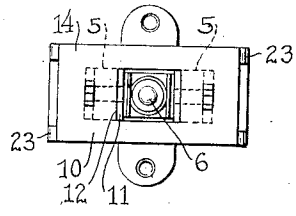


Fig. 4.



Inventor
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UNITED STATES PATENT OFFICE.

CHARLES J. KLEIN, DECEASED, LATE OF MILWAUKEE, WISCONSIN, BY HENRY C. KLEIN, ADMINISTRATOR, OF YONKERS, NEW YORK, ASSIGNOR TO THE CUTLER-HAMMER MFG. CO., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

ELECTRIC SWITCH.

1,408,097. Specification of Letters Patent. Patented Feb. 28, 1922.

Application filed February 28, 1918. Serial No. 219,587.

To all whom it may concern:

Be it known that CHARLES J. KLEIN, deceased, late a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, invented certain new and useful Improvements in Electric Switches, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to electric switches, and, while not limited thereto, is particularly applicable to concealed or flush mounted switches of the character employed for automobile spot-lights.

Among the objects of the invention is that of providing a switch of the character aforesaid, embodying all important functional advantages of switches regularly employed for like uses and capable of manufacture at greatly reduced cost.

A further object is that of providing an exceedingly simple, durable and efficient switch comprising few, and rugged parts capable of ready manufacture and assembly.

Other objects and advantages will hereinafter appear.

In the accompanying drawing, wherein is illustrated an embodiment of the invention,

Figure 1 is a longitudinal sectional view thereof;

Fig. 2 is a similar view showing certain parts in an altered relation; while,

Figs. 3 and 4 are respectively an end view and a bottom plan view thereof.

Referring to the drawing, the same shows a pair of spaced stationary contacts 5, 5 adapted to be engaged and bridged by a reciprocating contactor 6 comprising a reflexed resilient stamping having its side portions symmetrical and biased outwardly and each formed to provide a pair of outwardly disposed cam surfaces 7 and 8 merging in an abrupt crest 9. The contacts 5 are mounted upon the upper face of a perforated insulating base 10, with their adjacent ends arranged flush with the sides of the opening therein and in suitable relation to be engaged by the respective cam surfaces 8 of the contactor when in one position, said contactor being movable toward the base to force its cam extremities within said opening to disengage the fixed contacts.

For releasably restraining the contractor in the latter mentioned position, the opening of the base 10 is formed with downwardly facing shoulders 11, 11 adapted to be engaged by the respective cam surfaces 7 while the crests 9 are similarly adapted to respectively engage a pair of inwardly facing shoulders 12, 12 also formed within said opening, thereby preventing such spreading of the contactor as would bring the side portions thereof into dangerous proximity with the fixed contacts. For further spacing of the contactor from the fixed contacts when in off position, said side portions are inbent as shown at 13 and 13.

To facilitate the formation of the various shoulders within the opening of the base 10, the latter may be advantageously constructed of a pair of superposed sections 14 and 15, each provided with a centrally located rectangular opening, and the opening in the lower section 14 being of greater extent longitudinally of said sections than the corresponding opening in the upper section 15, whereby the exposed lower surfaces of the section 15 constitutes the shoulders 11 while the continguous sides of the opening in the section 14 constitute the shoulders 12.

The contactor 6 is centrally riveted or otherwise secured to the end of a reciprocable operating rod 16 and insulated therefrom by suitable washers 17, 18, said rod being adapted to reciprocate within a guiding sleeve 19 secured within a suitable opening in a support 20.

The support comprises a metallic plate 21 superposed upon an insulating plate 22 and secured thereto by means of integrally formed and terminally located lugs 23 of the former bent downwardly about the ends of the latter. Said plates are provided with registering openings to receive the rod 16, the sleeve 19 penetrating the opening of the plate 21 and being beaded therebeyond and the opening in the plate 22 being enlarged to receive such beaded portion. The outer end of the rod 16 is provided with an integral or rigidly secured handle 24 for

manual operation of the switch, the inner end of said handle having a shoulder portion 25 adapted to abut the outer end of the sleeve 19 for limiting movement of the rod 16 and its attached contactor in one direction, reverse movement of said members being limited by abutment of the washer 17 against the lower face of the plate 22.

A pair of terminal bars 26, 26 are riveted at their upper ends to the insulating plate 22, the adjacent portions of the plate 21 being cut away as shown at 27 for preventing electrical connection with said bars. Each of the bars 26 is provided with a terminal screw 28 while the lower ends of said bars penetrate the two sections of the base and are riveted therebeyond, thereby completing a rigid self supporting frame for the switch, while further serving to secure said sections in assembled relation.

In practice the fixed contacts 5 preferably comprise integral portions of the bars 26 inbent and arranged flatwise upon the upper surface of the base 10, said contacts thus performing the additional function of stops for fixing the vertical position of said base.

The various switch parts being in the position illustrated the resiliency of the contactor serves to maintain the lower cam surfaces 8 thereof in yielding engagement with the fixed contacts 5 while the latter also serve as shoulders for maintaining the contactor in its upper extreme position. Upon shifting of the contactor downwardly across the plane of the base 10, said cam surfaces are adapted to wipe across the opposed ends of said contacts, thus forcing the free ends of the contactor toward each other and permitting the crests 9 to pass suddenly from said contacts to the adjacent flush sides of the opening in the base section 15, thereby insuring practically instantaneous circuit interruption. Upon continued movement of the contactor, the crests 9 snap over the shoulders 11 of the base for permitting the cam surface 7 to engage said shoulders thereby releasably securing the contactor in open circuit posititon while preventing such expansion thereof as would cause engagement with the fixed contacts. Also, when in said position, the crests 9 are adapted to abut the shoulders 12 of the base thus providing an additional limit to the expansion of the contactor.

Under ordinary circumstances the switch is fully operative with the plate 14 omitted. However, under such conditions the shoulders 11 of the plate 15 are subjected to comparatively rapid wear. Thus the durability of the switch is greatly increased and its period of effective service prolonged by the addition of said plate 14 with its associated shoulders functioning as described.

What I claim as new and desire to secure by Letters Patent is:

1. In an electric switch, in combination, a base having an opening therein, a contact fixed to said base adjacent said opening and a contactor having a part adapted to engage said contact, said contactor being movable to force said part within said opening in said base, and said contactor and said base having coacting parts providing for sudden disengagement of said contactor from said contact during such movement of the former.

2. In an electric switch, in combination, a base having an opening therein, a pair of contacts fixed to said base on opposite sides of said opening and a contactor having parts adapted to engage and bridge said contacts and being movable for forcing said parts within said opening of said base, said contactor and said base having coacting parts providing for sudden disengagement of said contactor from said contacts during such movement of the former.

3. In an electric switch, in combination, a base having an opening, the latter being provided with a shoulder therein, a contact fixed to said base adjacent said opening and a resilient contactor having parts adapted to engage said contact and to move across the same and within said opening to effect disengagement of said contactor from said contact and engagement of the former with the shoulder within the opening of said base for retaining said contactor disengaged from said contact.

4. In an electric switch, in combination, a base having an opening, the latter being formed to provide a pair of shoulders therein, a contact secured to said base adjacent said opening and a resilient contactor having parts adapted to engage said contact and movable across the same and within said opening for disengaging said contactor from said contact and for co-operation with said shoulders to releasably restrain said contactor out of engagement with said contact.

5. In an electric switch, in combination, an insulating plate having an opening therein, a contact secured to one side of said plate adjacent said opening, and a resilient contactor having parts adapted to be forced through said opening for abutting engagement selectively with the portions of said contact and of said plate contiguous to said opening.

6. In an electric switch, in combination, an insulating plate having an opening therein, a contact plate secured flatwise upon said insulating plate, the end of the former being arranged flush with the side of the opening in the latter, the outer edges of said plates adjacent said opening providing opposed shoulders and a reciprocable contactor adapted alternately to engage and disengage said contact and having convergently sloping portions arranged to be forced through said opening and biased to engage said shoulders selectively for limiting movement of said

contactor in either direction, such engagement also serving to limit movement of said parts in response to said bias.

7. In an electric switch, in combination, an insulating plate having a transverse opening, a pair of contacts secured to one side of said plate and arranged to provide a continuation of the boundary of said opening, the exposed edges of said contacts and said plate adjacent said opening constituting opposed shoulders, and a reciprocable contactor adapted alternately to bridge and to disengage said contacts and having convergently sloping portions arranged to be forced through said opening and biased to engage selectively with certain of said shoulders in either extreme position.

8. In an electric switch, in combination, a flat insulating base having a transverse opening therein, a flat contact secured to one side of said base and arranged to provide a continuation of the boundary of said opening, the exposed edge of said contact and of said plate adjacent said opening constituting a pair of opposed shoulders, a reciprocable contactor for cooperation with said contact and having oppositely sloping portions said contactor parts being arranged to be forced through said opening and being biased to cause engagement of the respective sloping portions with one of said shoulders in either extreme position, said base having a second insulating shoulder adapted to be engaged by a part of said contactor when in one position for limiting movement thereof in response to its bias.

9. In an electric switch, in combination, a flat insulating base having a transverse opening therein, a pair of contacts secured to said base upon opposite sides of said opening and arranged to provide a continuation of the boundary of said opening, the exposed edges of said contacts and said base adjacent said opening constituting pairs of opposed shoulders, a reflexed reciprocable contactor adapted alternately to engage and disengage said contacts and having its reflexed sides similar and biased apart, each of said sides including oppositely sloping portions merging in a crest, said contactor parts being arranged to be forced through said opening to engage the shoulders of said contacts and of said base respectively for releasably restraining said contactor in either extreme position, said base having a second pair of insulating shoulders arranged to be engaged respectively by said crests in one position of said contactor for limiting spreading of the sides of said contactor.

10. In an electric switch, in combination, a flat insulating base having a transverse opening therein, a pair of contacts secured to said base upon opposite sides of said opening and arranged to provide a continuation of the boundary of said opening, the exposed edges of said contacts and said base adjacent said opening constituting pairs of opposed shoulders, a reflexed reciprocable contactor adapted alternately to engage and disengage said contacts and having its reflexed sides similar and biased apart, each of said sides including oppositely sloping portions merging in a crest, said contactor parts being arranged to be forced through said opening to engage the shoulders of said contacts and of said base respectively for releasably restraining said contactor in either extreme position, said base having a second pair of insulating shoulders arranged to be engaged respectively by said crests in one position of said contactor for limiting spreading of the sides of said contactor, said sides having portions thereof inbent for spacing the same from the fixed contacts when in the latter position.

11. In an electric switch, in combination, a base comprising a pair of superposed sections having openings arranged to provide a transverse passage through said base, the opening in one of said sections being larger than the corresponding opening in the other section, thereby providing opposed pairs of contiguous shoulders within said passage, a pair of contacts having parts arranged flush with the sides of the opening in said latter mentioned section, the respective contacts having means formed integral therewith for securing the same to said base and also for securing the sections of said base in assembled relation, and a contactor having parts movable bodily into and out of said passage for engaging said contacts and said shoulders selectively.

12. In an electric switch, in combination, a base, a pair of terminal bars riveted thereto and projecting at right angles therefrom in parallel spaced relation to each other, the opposite ends of said bars being secured in insulated relation to a support, said support being arranged in parallel relation to said base to form a self supporting switch frame, said bars being provided with terminals and having integrally formed contacts abutting said base within said frame, and a contactor movable within said frame to engage and disengage said contacts.

13. In an electric switch, in combination, a base, a pair of terminal bars having parts bent at right angles thereto to form contacts, said bars being terminally riveted to said base with said contacts abutting the latter, a support secured in insulated relation to the opposite ends of said bars by riveting, and a contactor movable between said bars for engaging and disengaging said contacts.

14. In an electric switch, in combination, a base, a pair of terminal bars each having a part bent at right angles thereto to form a contact, said bars being terminally riveted

to said base with said contacts abutting the latter, an insulating plate secured to the opposite ends of said bars by riveting, a supporting plate secured to said insulating plate in spaced relation to said bars by means of integral lugs clamped about the ends of said insulating plate, and a contactor movable with respect to said contacts for alternately engaging and disengaging the same.

In witness whereof, I have hereunto subscribed my name.

HENRY C. KLEIN,
Administrator of the estate of Charles J. Klein, deceased.