No. 648,951. Patented May 8, 1900.

A. HANSON.

ELECTRIC SWITCH.

(Application filed May 31, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

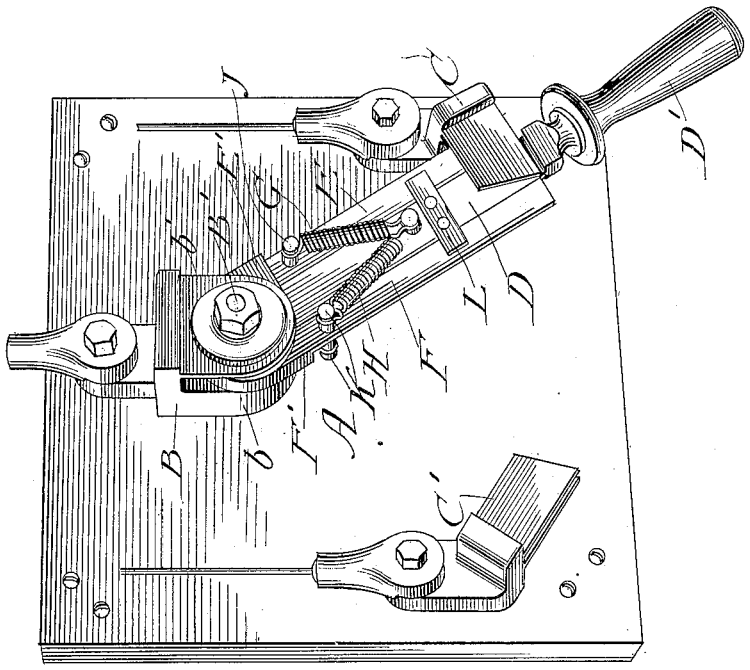

Fig. 2.

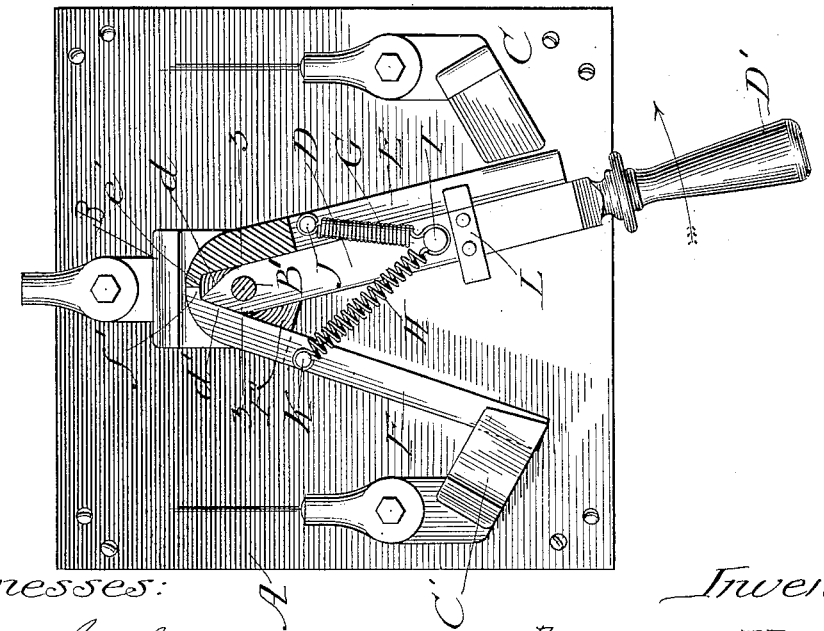

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Fig. 3.

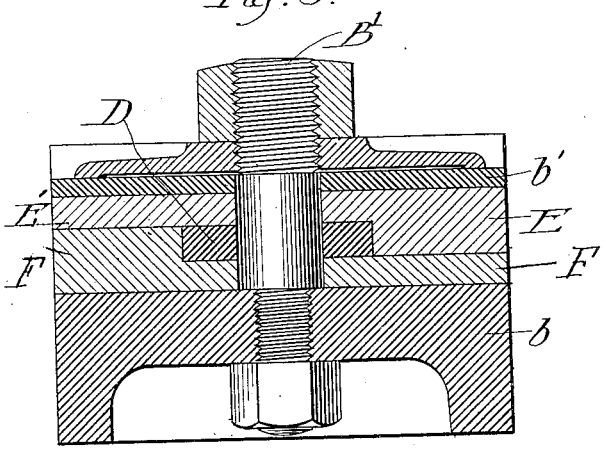


Fig. 4.

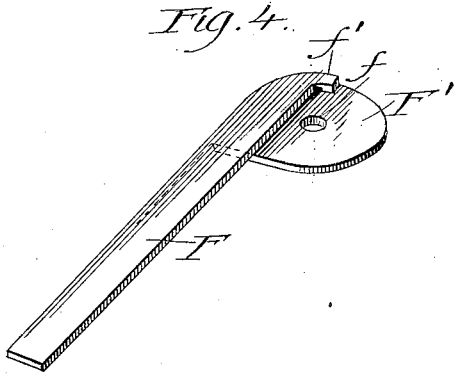


Fig. 5.

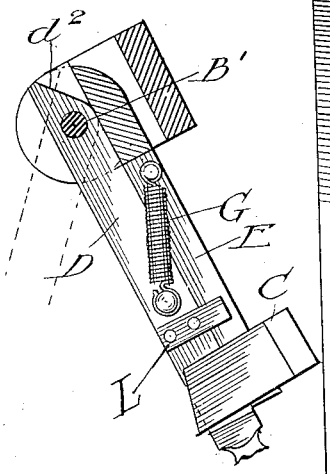
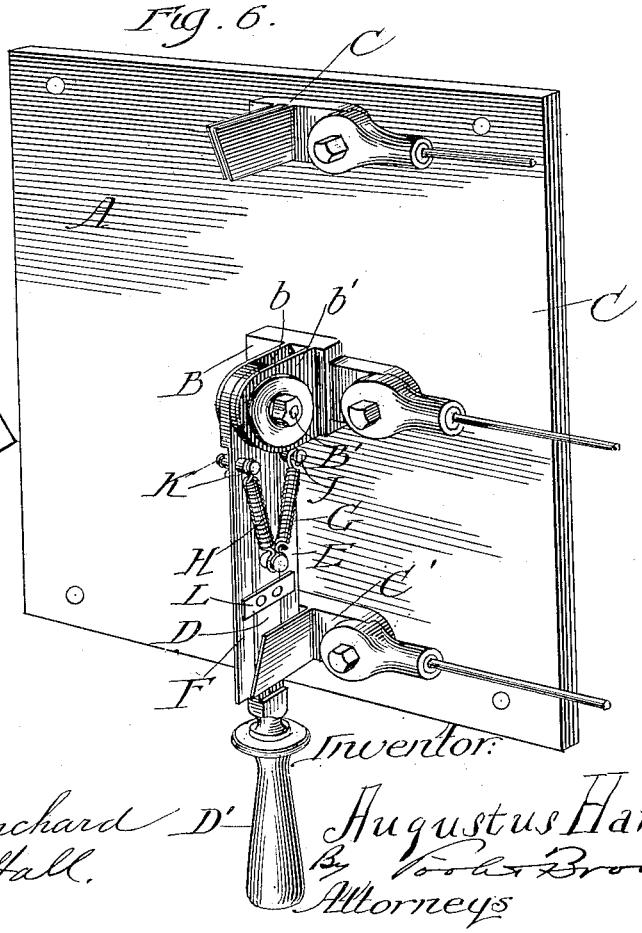


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

AUGUSTUS HANSON, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN H. GOEHST, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 648,951, dated May 8, 1900.

Application filed May 31, 1899. Serial No. 718,810. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS HANSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Switches; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to novel features of construction in quick-break electric switches of the kind having a main and one or two additional or auxiliary switch-blades having spring connections with each other and operating in connection with either one or two stationary spring-contact outer clips. The object of the invention is to provide an improved construction in the joints of such switches by which greater strength, as well as an improved electrical contact, is obtained in the parts of such joints and in other features of the switches, as will hereinafter appear.

As quick-break switches have heretofore been made the outside or quick-break blade or blades have been pivotally connected with the center or pivot clip by means of a ring which fits into segmental grooves formed in the several blades in such manner that they together constitute, in effect, an annular groove, whereby the outside blades are adapted to swing on a central axis concentric with the center bolt or pivot of the main blade. Such prior construction has been found objectionable, especially in double-throw switches, wherein these blades are used, for the reason, among others, that the ring referred to is liable to break, and the blades also break at the points where the segmental grooves are located by reason of the fact that the metal is greatly reduced in thickness at these points. In a switch made in accordance with my invention the main switch-blade is pivoted on a central pivot-pin, and the auxiliary blade or blades at one or both edges thereof is provided adjacent to the joint with a flat lateral projection or cheek-piece, which engages the pivot and overlaps the main blade and has contact both with the main blade and the side or cheek plate of the center clip, so that both the main blade and the quick-action blade or blades are pivoted directly to the said pivot, while the said laterally-extending plate or cheek-piece is interposed and has bearing against both the central blade and the side of the center clip, thereby giving a broad or extended contact-surface between said central clip, the main blades, and the cheek piece or pieces, insuring ample contact-surfaces for the passage of the electric current from the central clip to both the main and the auxiliary blades. In connection with the quick-action blade thus constructed a device is provided at the inner ends of the main or auxiliary blades embracing parts adapted for contact with each other when the main blade is swung on the pivot in a direction away from the outer spring-clip, which engages the quick-action blade, so as to positively move the quick-action blade out of engagement with the spring-clip, thereby releasing the quick-action blade and allowing it to resume its position in contact with the main blade.

The invention also embraces other features of construction, as will be hereinafter described, and pointed out in the appended claims.

As shown in the drawings, Figure 1 is a perspective view of a quick-break double-throw switch constructed in accordance with my invention. Fig. 2 is a front elevation thereof with parts of the joint broken away to show parts beneath. Fig. 3 is a section through the joint, taken on line 3 3 of Fig. 2. Fig. 4 is a perspective view of one of the quick-break or auxiliary blades removed from the other parts of the switch. Fig. 5 is a detail view of the joint employed in a single-throw switch where only one auxiliary blade is used. Fig. 6 is a perspective view of a double-throw switch having two quick-action blades where the switch-blades swing in a plane perpendicular to the base on which the switch is mounted.

As shown in said drawings, A indicates a base or plate of insulating material, such as slate or the like, on which the switch is mounted.

B indicates the stationary center clip, which is attached to the base, and C C′ the outer spring-clips, also secured to said base.

D indicates the center blade of the switch,

which is provided with a handle D′, and E and F are the quick-action or auxiliary blades, located at opposite edges of the main blade and in the same plane therewith.

The main and auxiliary blades are pivotally connected with the center clip B by a pivot-bolt B′, and the free and outer ends of the blades engage the outer spring-clips, said spring-clips each being of slotted form and provided with spring or resilient jaws adapted to frictionally engage opposite sides of the blades in the usual manner.

Now, referring to the construction of the center joint of the switch, the central clip B thereof is made in the usual manner, with two parallel cheek-plates *b b′*, through which the pivot-bolt B′ passes and between which the ends of the switch-blades are located. The central or main blade D is provided with an aperture near its end through which the pivot-bolt B′ passes. The quick-action blades E and F, which are located in the same plane with and at either edge of the main blade, are held by spring connections normally in contact with the opposite edges of the said main blade. Said auxiliary blades E and F are each provided with a laterally-projecting plate or cheek-piece E′ F′, which overlaps the main blade and is interposed between and in contact with the same and the adjacent or inner surfaces of the cheek-pieces *b* or *b′* of the central clip. Said cheek-pieces E′ F′ of the auxiliary blades are provided with bearing-apertures *e f*, through which passes the bolt B′. Said cheek-pieces may be secured to the sides of the auxiliary blades by suitable attaching means, as by rivets and brazing, or they may be made or forged in one piece with the auxiliary blades. In some instances said cheek-pieces and the blades may be cut and stamped or swaged from a single piece of metal. Preferably the cheek-pieces are of approximately-circular form, so that the cheek-piece of each blade projects over and comes in contact with the opposite blade, as well as with the main blade. Obviously the cheek-pieces, made as described, being in bearing-contact with the opposite parts of the cheek-plates *b b′* of the center clip afford extended contact-surfaces between the clip and the blades, thereby insuring ample contact-surfaces between said parts for the passage of the current.

The auxiliary or quick-action blades, which are pivotally connected with the center clip and main blade in the manner described, are held normally in contact or parallel with the main blade by suitably-applied springs, herein shown as having the form of coiled expansion-springs G H, located at opposite sides of the blades, so as to exert an even tension or strain thereon. Both of said springs G and H are connected with opposite studs I I, which project from opposite sides of the main blade, the springs G being connected at their outer ends with studs J on opposite sides of the blade E, and the springs H H being connected with opposite studs K K on the blade F. To hold the auxiliary blades in the same plane with the main blade, the latter is provided with guide-pieces L L, secured to the opposite faces thereof and projecting beyond the side edges of the main blade, so as to overlap the auxiliary blades when the same are brought against the side edges of the main blade. When the switch-blades thus constructed are swung to one limit of their movement and are engaged with one of the outer spring-clips, said clip will bear upon the opposite sides of the main blade, as well as the auxiliary blade, which is on the side of the main blade, at which the clip engaged thereby is located. When the main blade is moved by hand out of engagement with the clip at the time engaged by it, the frictional engagement of the spring-clip with the auxiliary blade will be sufficient to prevent the release of the same, so that the quick-action blade will still remain in engagement with said clip, this position of the parts being shown at the left-hand side of Fig. 2.

In order to provide for the release of the quick-action or auxiliary blades from the spring contact-clips, devices are provided as follows: The pivoted end of the main blade is provided with an extension or heel projecting beyond the pivot and having inclined or beveled edges *d d′*, located in position for contact with the inner face or edge of the auxiliary blade when the main blade reaches an angular position with respect to the auxiliary blade, the parts being so arranged that when the main blade has been swung to an angle secured for the quick-break action the angular end of the main blade will strike the adjacent surface of the auxiliary blade, and thus positively swing or move the auxiliary blade until it is free from the outer spring-clip, after which the auxiliary blade will be thrown quickly by the action of the springs G and H into contact with the main blade, thereby quickly breaking the electric current. This action is clearly shown in Fig. 2, wherein the auxiliary blade F is still in engagement with the outer spring-clip C′, but is being moved out of engagement therewith by pressure of the inner end or heel of the main blade, which latter is moving toward the clip C. As an additional means of moving or actuating the auxiliary blades each blade is shown in Fig. 2 as provided with a projecting lug or block *e′ f′*, and said lugs are arranged in the same plane with the main blade and their ends are adapted to form shoulders which are adapted to come in contact with each other at the same time the end of the main blade makes contact with that one of the auxiliary blades which is at the time held in engagement with one of the outer spring-clips. The lugs or blocks *e′ f′* serve to make the joint very much stronger and insure a more positive action of the parts than is afforded by the projecting end of the main blade alone. Ob-

viously, however, when the said lugs e' f' are present the main blades need not necessarily have the heel for action on the auxiliary blade to afford the releasing movement thereof referred to.

Fig. 5 illustrates a construction which may be employed for the quick-break single-throw switch where only one auxiliary blade is used. In this instance, there being only one blade, the contact shoulders or lugs e' f' cannot be employed, and the main blade D is provided with a projection or heel having a beveled face or shoulder d^2, adapted for contact with the inner face of the auxiliary blade E, so as to positively move the same out of contact with the spring-clip engaged by it.

Fig. 6 illustrates my invention as applied to a double-throw switch in which the switch-blades swing in a plane perpendicular to the face of the insulating base or plate A, the outer spring-clips C C′ in this instance being located in the same vertical plane, so that the switch-blades are thrown or moved through an angle approximating one hundred and eighty degrees in carrying them from one outer clip to the other.

I claim as my invention—

1. A quick-break electric switch comprising a center clip having parallel cheek-plates, a center pivot-bolt, a main blade mounted on said pivot-bolt, and an auxiliary blade located edge to edge and in the same plane with the main blade and provided outside of the plane of said main blade with a cheek-piece which overlaps said main blade from edge to edge and is interposed between said main blade and one of the cheek-pieces of the center clip, said cheek-piece and auxiliary blade being provided with apertures through which said pivot-bolt passes.

2. A quick-break electric switch comprising a center clip having parallel cheek-plates, a main blade, a pivot-bolt passing through the cheek-plates of the center clip and the main blade, two auxiliary blades located at opposite edges of the main blade and each provided outside of the plane of the main blade with a cheek-piece, which cheek-pieces engage at their outer faces the cheek-plates of the center clip and are separated by a space within which is located the pivoted end of the main blade.

3. A quick-break electric switch comprising a center clip having parallel cheek-plates, two outer spring contact-clips, a main blade, a pivot connecting the main blade with the center clip, two auxiliary blades located at opposite edges of the main blade and provided each with a laterally-projecting plate or cheek-piece which is interposed between the main blade and one of the cheek-plates of the clip and engages said pivot, said auxiliary blades being provided with opposing contact-shoulders adapted for engagement with each other for giving positive movement to said auxiliary blades for disengaging them from the said outer contact-clips.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 29th day of May, A. D. 1899.

AUGUSTUS HANSON.

Witnesses:
WILLIAM L. HALL,
GERTRUDE BRYCE.