June 28, 1927. 1,633,979

H. J. CRABBS

DISCONNECTING SWITCH

Filed Sept. 20, 1923

Fig. 1.

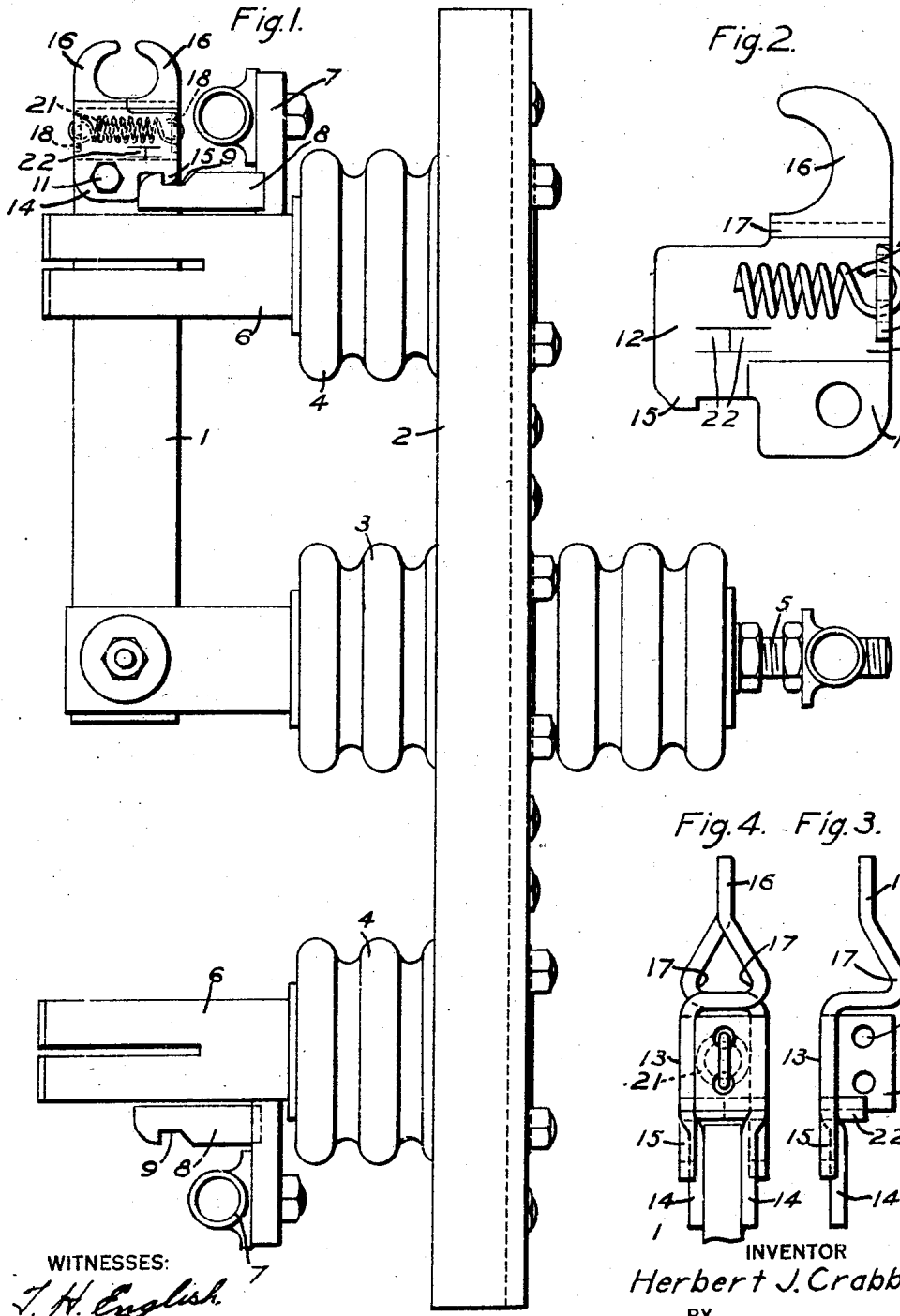


Fig. 2.

Fig. 4. Fig. 3.

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UNITED STATES PATENT OFFICE.

HERBERT J. CRABBS, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

DISCONNECTING SWITCH.

Application filed September 20, 1923. Serial No. 663,732.

My invention relates to switches and particularly to single or double-throw knife-blades switches such as are commonly employed on structures for connecting terminals of high-tension circuits.

One object of this invention is to provide a switch wherein the use of a "hook-stick" in the usual manner causes the blade first to be positively pried loose from the contact jaws by the operating lever, after which operation the blade may be entirely withdrawn from the jaws with little effort.

A further object of my invention is to provide a unitary latch member that is formed by stamping from sheet metal.

It is a still further object of my invention to provide a stamped latch member of such shape that a pair of duplicate members, when mounted on the switch blade, complete the latching mechanism.

It is yet another object of my invention to provide a latch member which may be stamped and formed from a piece of sheet metal in a single operation by reason of the fact that none of the portions of the latch are bent at an angle greater than a right angle.

Switches of this type are usually devoid of operating handles and are provided with eyelets or various forms of latches adapted to be engaged by a "hook-stick" or operating rod for moving the switch blade in and out of contact with the jaws. In service, such switches are infrequently operated and remain in closed position for long periods of time, during which interval, due to oxidation and corrosion of the contacting members, the blades become fastened within the jaws with such security that it becomes necessary to pry them therefrom by suitable instruments, it being frequently impossible to dislodge them quickly by using the "hook-stick" in the usual manner. In cases of emergency, serious damage may result to machinery or the life of an operator may be endangered by reason of the sticking of the blade within the switch jaws when it is necessary to quickly open the circuit.

My invention is an improvement upon the disconnecting switch shown and described in the patent to Christian Aalborg, No. 1,508,148 issued September 9, 1924, and assigned to the Westinghouse Electric & Manufacturing Company.

In the accompanying drawings,

Figure 1 is a side elevation of the improved switching apparatus showing the blade in its upper operative position.

Fig. 2 is a side elevation of a latch member.

Fig. 3 is an end view thereof.

Fig. 4 is an end view of a pair of latch members in their operative positions.

In the several figures of the drawing, similar reference numerals indicate like parts.

In the preferred embodiment of my invention, a disconnecting switch blade 1 is mounted on a panel board 2 by means of suitable insulators 3 and 4. The insulator 3 extends through the panel board 2 and is provided with a terminal 5 for connection to a line conductor. The blade 1 is pivotally mounted on the insulator 3.

The insulators 4 support stationary contact jaws 6 which are adapted to receive the blade 1. The stationary jaws 6 are each provided with suitable terminal members 7 for connection to the line conductors, and with a stationary extension 8 which terminates in a latch 9. The extension 8 on the upper contact jaws 6, is placed on one side of the blade 1, while the extension 8 on the lower contact jaws 6 is placed on the other side of the blade 1.

The free end of the blade 1 is provided with a pair of perforations through which extend bolts 11 for securing latch members 12 thereto.

The latch members 12 are formed by a stamping operation from a single piece of sheet metal and comprise a body portion 13 which is in a single plane. A perforated lug 14 is offset at a slight angle from the body portion 13, but extends substantially parallel to the plane and the body portion 13. The perforation in the lug 14 is for the reception of the bolts 11.

A hook member 15 extends from the body portion 13, and in the plane thereof, in the direction of the lug 14. The hook member 15 is adapted for co-operation with the latch member 9 mounted on the contact jaws 6, as is shown in Fig. 1.

A hook portion 16 is offset from the body portion 13 by a reverse bend 17. By reference to Figs. 3 and 4, it is observed that the hook portion 16 terminates directly over the center line of the assembled latch members,

which is also the center line of the blade 1. The hook 16 extends in the opposite direction from the lug 14.

A lug 18, which is bent at right angles to the body portion 13, is provided with perforations 19 that are adapted for engagement with a spring 21, which is interposed between the latch members, as is shown in Fig. 1. Projections 22 are struck from the body portion 13 in such manner that they have a slight clearance from the end of the blade 1, as is shown in Fig. 4.

A pair of the latch members 12 are secured to the opposite faces of the free end of the switch. Since these latch members are similar in construction, they may be placed in reverse relation and they then become complementary to each other without alteration. Upon being connected by the spring 21, the two latch members are drawn toward each other about the bolts 11 as pivots until the projections 22 engage the end of the blade 1, further turning movement being thereby prevented, since the end portions 17 of the complementary hook portions 16 can not slip past each other under the influence of the spring 21.

It may be assumed that the blade 1 occupies its illustrated position with the latch member 12 that is visible (Fig. 1) in engagement with the latch member 9. The latch member 12 is retained in this position to positively lock the blade by the spring 21.

In order to disconnect the switch 1 from the contact jaw 6, a hook-stick is applied to the outer hook 16 and a force exerted thereon. The member 12 then turns in a counterclockwise direction about its bolt 11, causing the lug 14 to engage the end of the extension 8 and exert a cam action thereon. This cam action is of sufficient force to cause the blade 1 to be moved relatively to the stationary contact jaws 6, even though they are bound by a film of oxide or other friction-producing substance. The latch 9 and hook 15 are simultaneously disengaged.

The singular movement of the members 12 about the bolts 11 is limited by reason of the engagement of the lugs 18 with the end of the blade 1, although this movement is sufficient to allow the latch members 9 and 12 to disengage.

When the switch is actuated to its closed position by the "hook-stick," the latter engages the hook portion 16 of the latch member 12 which does not lock it in that position. The operative latch member is accordingly free to move about its pivot 11 against the force of the spring 21 upon the engagement of the inclined portions of the latch member 9 and the hook 15. The hook 15 snaps to operative position when the blade is in its fully closed position.

It is to be observed that when the switch is in its upper position, as shown in Fig. 1, the latch member on the nearer face of the blade 1 is in engagement with the extension 8. When the blade 1 is in its lower position, the other latch 12, on the further face of the blade 1, is in engagement with the corresponding latch member 9, and its hook portion 16 is in position to be engaged by the "hook-stick".

It will thus be seen that I have provided a unitary latch structure which can be formed by punch press operations from sheet metal. It is to be observed that this latch is free from projections which require bending movements of more than 90° from the plane of the body portion thereof.

While I have described and illustrated but one embodiment of my invention, it will be apparent to those skilled in the art that various changes, modifications, substitutions, additions and omissions may be made in the apparatus illustrated without departing from the spirit and scope of the invention as set forth by the appended claims.

I claim as my invention:

1. A unitary stamped latch for a switch blade comprising a main body portion in one plane, a lug bent into a second plane, and a hook member bent laterally from and then reversely towards said main body portion.

2. A unitary stamped latch for a switch blade comprising a main body portion in one plane, a perforated lug bent into a second plane and adapted for engagement with a securing member, a lug bent at substantially a right-angle to said body portion and adapted for co-operation with a resilient holding element, a hook portion extending in a reverse bend from said body portion, a latch member extending from said body portion in the plane thereof, and a portion bent from said body portion and adapted to act as a stop member.

3. A unitary stamped latch for a switch blade comprising a main body portion in one plane, a perforated lug bent into a second plane, and a hook member extending from said body portion in a reverse bend and oppositely disposed relative to said lug.

4. A unitary stamped latch for a switch blade comprising a main body portion in one plane, a perforated lug bent into a second plane, a latch member extending from said body portion in substantially the plane thereof, and a hook member extending from said body portion in a reverse bend and oppositely disposed relative to said lug.

In testimony whereof, I have hereunto subscribed my name this 11th day of September, 1923.

HERBERT J. CRABBS.