

Dec. 13, 1932.

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1,890,809

SENSITIVE DOOR EDGE SWITCH

Filed March 29, 1932

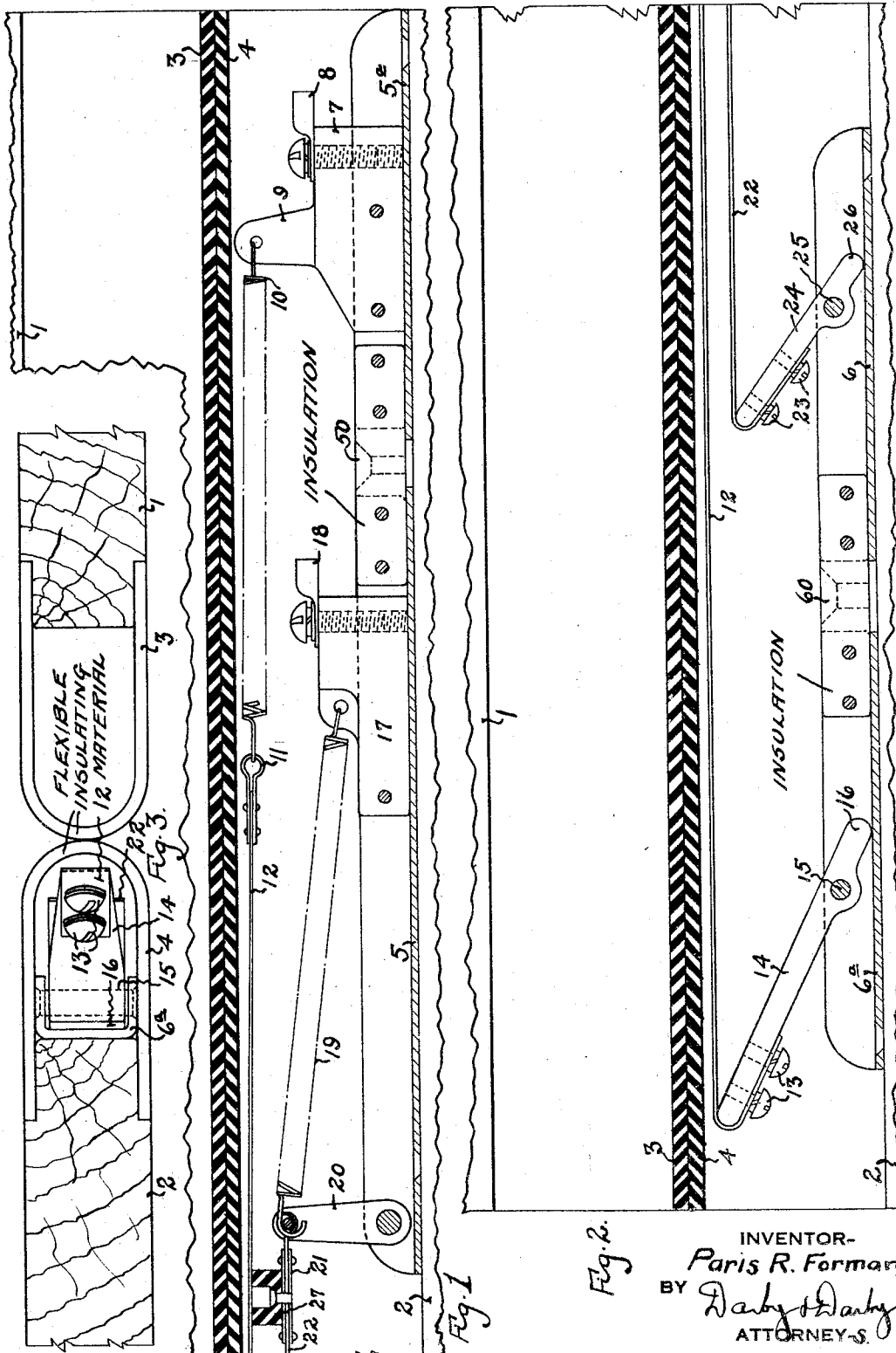


Fig. 2.

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SENSITIVE DOOR EDGE SWITCH

Application filed March 29, 1932. Serial No. 601,758.

This invention relates in general to improvements in the construction of the switch now extensively employed within the flexible edge of power operated doors for vehicles and the like.

The main object of the invention is to provide an improved form of switch structure of this nature which, while simple in construction, is of such a rugged nature as to insure correct operation thereof in commercial use.

This invention involves a number of objects which are successfully secured thereby by reason of the construction employed, as will appear from the following description.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, all as will be set forth in detail below in connection with the attached drawing.

Referring to the drawing;

Figures 1 and 2, taken together, represent a vertical cross sectional view through the edge of a door to which this invention has been applied, with some parts broken away, to reduce the size of the figure.

Fig. 3 is an end elevational view of the device.

It is common practice in the transportation field to employ in connection with power operated doors reversing mechanism under the control of a switch mounted on the door which is positioned so as to engage any obstruction in the path of the door as it closes.

This switch is connected to the reversing mechanism which controls the power device for operating the door so that if the door strikes an obstruction and closes it, the power device is reversed and the door opens. It is common practice to mount this switch on the forward edge of the door within a flexible protecting casing of rubberized fabric, for example, so that it may be operated by pressure on the casing. Such devices are used on sliding doors, as well as on folding doors, either of the single or double section type.

The invention will be better understood by reference to the drawing:—The switch has been shown applied to a two-section sliding door in which the sections slide towards and away from each other in closing and opening.

The forward edges of these doors are shown at 1 and 2 provided with flexible casings 3 and 4 mounted so as to provide a closed space in conjunction with the doors. These flexible casings may be made of sheet rubber, rubberized fabric and similar materials. The space within the casing 3 contains no mechanism and may, if desired, be filled with a resilient material, such as sponge rubber. Within the space formed by casing 4 is mounted the switch of this invention. Mounted on the forward edge of door 2, near the top thereof, are U-shaped channel plates 5 and 5^a secured together by a block of insulating material 50. This unit, made up of the plates 5 and 5^a, is secured to the forward edge of door 2. Secured to the plate 5^a is a supporting block 7, to which the terminal clip 8 is secured. The block 7 is provided with an arm 9 to which one end of a coiled spring 10 is secured. The other end of the spring is secured by means of an attaching loop 11 to one of the electrodes 12 of the switch. This electrode is in the form of a long thin metal band which is supported at its other end by means of an arm 14 pivotally mounted at 15 on another U-shaped plate 6^a secured to the forward edge of the door 2 near the bottom thereof. The band 12 is secured to the arm 14 by a pair of screws 13. Arm 14 extends beyond the pivot point, as indicated at 16, so as to engage the plate 6^a and limit the rotation of the arm in one direction as will be obvious. A second block 17 is mounted upon plate 5 and has secured to it a terminal clip 18. Secured to this block at one end is a coiled spring 19 which has its other end attached to a short arm 20 pivotally mounted on the plate 5. A second electrode 22 in the form of a thin metal band is secured to the arm 20 by the attaching means 21. The other end of band 22 is secured by machine screws 23 to an arm 24 pivotally mounted at 25 on the plate 6. This arm likewise has an extension 26 to limit rotation of arm 24 in one direction. Secured to the strip 22 adjacent its point of attachment to arm 20 is a spacing block 27 of insulating material which lies between the two electrode bands 12 and 22 and holds them in spaced relation. As will be noted the extensions on arms 14

and 24 are positioned so that they will engage the plates 6^a and 6 under the tension of springs 10 and 19 acting through the bands 12 and 22 respectively. It is, of course, apparent that the blocks 7 and 17 are made of conducting material. As in the case of plates 5 and 5^a the plates 6 and 6^a are united together by means of the block of insulating material 60 and the whole unit is attached to the forward edge of the door. The controlling circuit wires will, of course, be attached to the terminal clips 8 and 18.

In the operation of this device if the doors in closing strike an obstruction, flexible edge 14 will, of course, collapse and as a result electrode 12 will move into contact with electrode 22 to complete the controlling circuit to effect reversal of movement of the motor which operates the doors.

Arms 14 and 24 are so mounted that if excess pressure is placed on the collapsible edge they may oscillate towards the door, or if the door strikes an obstruction opposite either one of them they may likewise rotate, preventing any undue strain on the parts and preventing injury to a person if the obstruction be a person. The springs 10 and 19 will, of course, return the parts to normal position and normally hold them in the position shown in the drawing. Such an arrangement is known in the art as a "sensitive door edge" which, as will be apparent, merely involves a collapsible or deformable door edge which operates a switch.

From the above description it will be apparent that this invention resides in certain novel features of construction which may be effected in other ways by those skilled in the art, and I do not, therefore, desire to be strictly limited to the disclosure as given for purposes of illustration, but rather to the scope of the appended claims.

What I seek to secure by United States Letters Patent is:

1. A mechanism as described, comprising a door having a collapsible casing secured to the edge thereof, a pair of electrode bands mounted on the edge of the door within the casing in spaced relation, resilient means attached to said bands for holding them under tension, and means for holding the bands normally in spaced relation.

2. A device as described comprising a door, a pair of electrode bands, means for attaching said bands to the edge of the door at one end of the bands, resilient members attached to the other ends of the bands and secured to the edge of the door, means for holding the bands in spaced relation and insulated from each other, and a flexible casing enclosing the forward edge of the door and said electrodes.

3. A device as described comprising in combination with a door, a pair of pivotally mounted arms on the door edge, a pair of

conducting electrodes attached to said arms, a pair of springs for attaching the other ends of the electrodes to the door edge, said electrodes normally lying in spaced relation, and a protecting casing enclosing the forward edge of the door.

4. In a device as described, the combination with a door, a pair of arms pivotally mounted on the edge of the door, a pair of conducting electrodes secured to said arms, a pair of springs attached to said electrodes and secured to the edge of the door, means introduced between the electrodes for holding them normally out of contact, and a protecting casing enclosing all of said parts and attached to the edge of the door.

5. A device as described, comprising a door, a pair of arms pivotally mounted on the edge of the door, a pair of metal bands secured to said arms, springs for attaching the other ends of said bands to the edge of the door, means for limiting rotation of the arms under the tension of said springs, and flexible means for enclosing all of said elements.

6. A device as described, comprising a door, a pair of arms pivotally mounted on the edge of the door, a pair of metal bands secured to said arms, springs for attaching the other ends of said bands to the edge of the door, means for limiting rotation of the arms under the tension of said springs, means for normally holding the bands in spaced relation, and flexible means for enclosing all of said elements.

7. A device as described, comprising a door, a pair of arms pivotally mounted on the edge of the door, a pair of metal bands secured to said arms, springs for attaching the other ends of said bands to the edge of the door, means for limiting rotation of the arms under the tension of said springs, means for normally holding the bands in spaced relation, flexible means for enclosing all of said elements, and means for making electrical connection with said bands.

In testimony whereof I have hereunto set my hand on this 24th day of March A. D., 1932.

PARIS R. FORMAN.