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SENSITIVE DOOR EDGE STRUCTURE

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**Fig. 1**

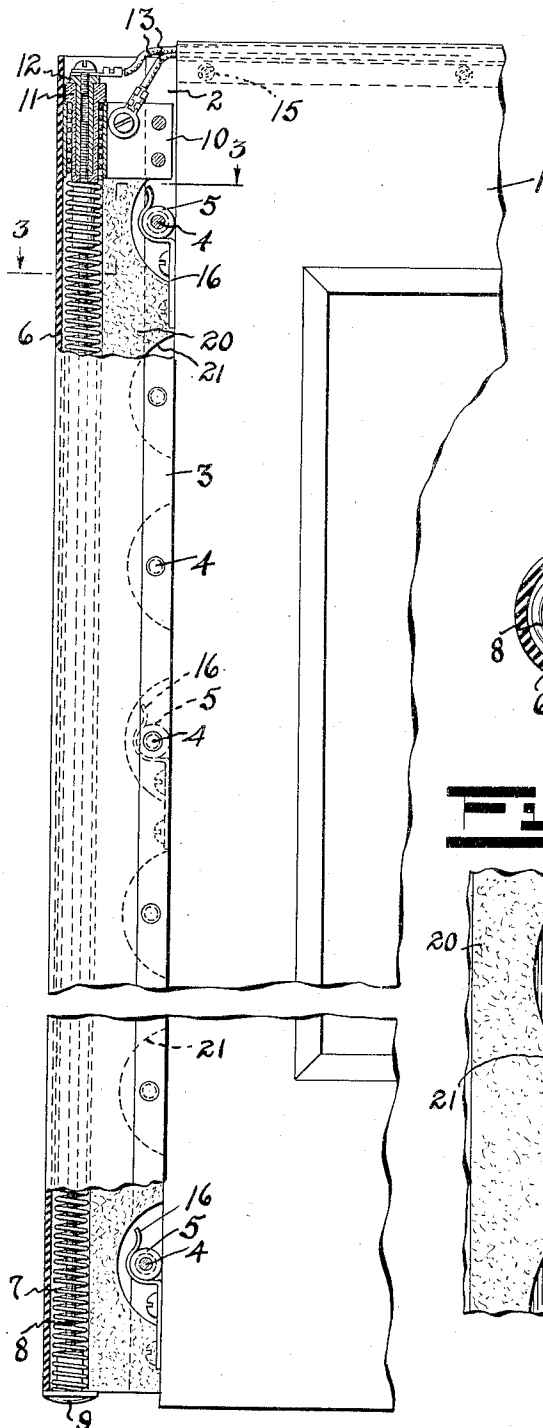


**Fig. 2**

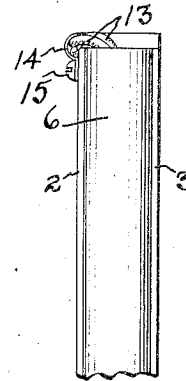


**Fig. 3**

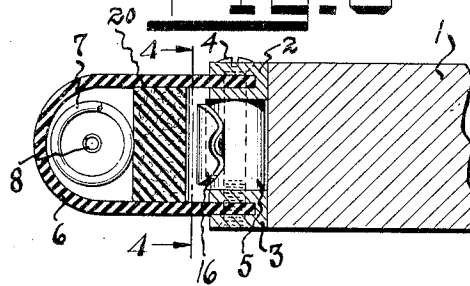


**Fig. 5**

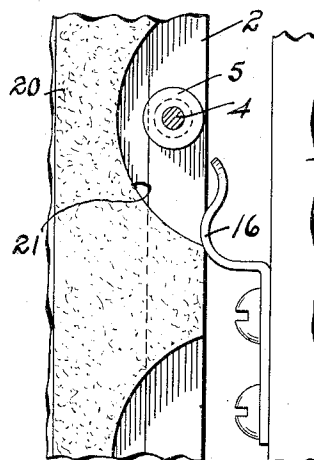
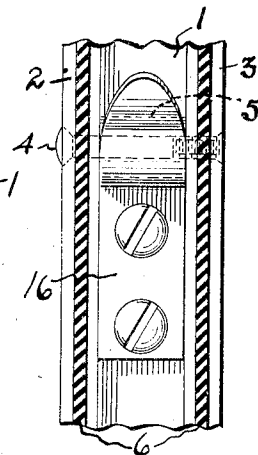


**Fig. 4**



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## UNITED STATES PATENT OFFICE

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## SENSITIVE DOOR EDGE STRUCTURE

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9 Claims. (Cl. 200—54)

This invention relates to so-called "sensitive edges" for vehicle doors by means of which controlling mechanism for the door operator is actuated to effect a reversal of the movement of the door should it strike an object in closing.

The general object of this invention is to provide an improved form of sensitive edge structure in the form of a unit which may be readily mounted upon and removed from the door as a single piece.

The other detailed objects of the invention will be apparent from the following description when taken in connection with the attached drawing.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, all as will be described in greater detail in the following specification.

In the accompanying drawing,

Figure 1 is a side elevational view of the forward edge portion of a door with some parts broken away showing the invention applied thereto;

Figure 2 is a front elevational view of a portion of the door with the device of the invention attached;

Figure 3 is a cross-sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 3; and

Figure 5 is an enlarged detailed view showing the internal construction and the manner of supporting the sensitive edge unit.

It is common practice today to employ reversing switches on the forward edge of vehicle doors to effect their reversal in direction of movement in the event they strike an object in closing. The switch is incorporated into a flexible encased housing built onto the door to provide the so-called "sensitive edge". For example, these devices are frequently used on the doors of subway cars. At the present time there is a tendency, which is growing, to apply these devices to the edges of elevator and hatchway doors. In such use the appearance, construction and application thereof to elevator and hatchway doors become of importance from a decorative viewpoint. In addition, continuity of service makes it desirable to permit ready application and removal of the sensitive edge structure to and from a door. The

general purpose of this invention is to provide a physical structure which blends in with its surrounding decorative feature when applied to elevator and hatchway doors and one which comprises a self-contained unit which may be readily mounted on and removed from a door. In addition

this structure is associated with the door in such a way as to be flush with the sides thereof and to, in appearance, form but a continuation thereof. Other details of construction and the advantages thereof will be referred to in connection with the following description.

There is illustrated at 1 a portion of a door which may, of course, be a door for any purpose but which here will be referred to as an elevator door. The sensitive edge unit is mounted on the forward edge thereof and is flush with the sides of the door, as is clear from Figure 2. This unit comprises a pair of shallow channel members 2 and 3 preferably made of metal and desirably of brass, suitably finished. The channels 2 and 3 are united together in spaced relation by a series of screws or bolts 4 which extend therethrough and therebetween. Interposed between the strips 2 and 3 and mounted on the screws are the spacing members 5 which are of such length as to hold the strips with the desired spacing. The spaces are all of uniform length so that the strips are parallel, and with respect to a particular door the combined width of the metal parts thus formed is exactly equal to the thickness of the door so that the sides thereof are flush.

The transverse width of the slots formed by the side arms of the strips 2 and 3 is equal to the thickness of the channel shaped casing 6, the free edges of which lie in the slots and through which the bolts 4 pass. This casing or housing 6 is preferably made of sheet rubber, rubberized fabric, or other suitable flexible material. As shown in Figure 1, the strips 2 and 3 and the casing 6 are of such vertical height as to be substantially equal to the height of the door. Mounted in the casing in front of the strips is a bar or strip 20 of some suitable resilient material, such as sponge rubber, which extends upwardly from the lower end of the casing, see Figure 1, and terminates short of the top thereof. On the face of the bar adjacent the channels or strips 2 and 3 are a series of substantially semi-circular recesses 21 which are so positioned as to coincide with the spacers 5. In addition, these recesses are provided at intermediate points. This renders the bar 20 more flexible and, therefore, more easily deformable for a purpose to be described shortly.

In the space between the bar 20 and the curved side of the housing 6 are a pair of electrodes or contact members 7 and 8. The member 7 is in the form of a relatively large coil spring and the member 8 mounted concentrically with the member 7 is in the form of a wire, or, as illustrated,

in the form of a Bowdin wire. The lower ends of the electrodes are attached to an insulating plug or support 9 in any suitable and well known manner. The plug 9 is arranged so that its flanged head rests against the lower edges of the casing 6 and the bar 20. At 10 is a metal bracket mounted between and secured to the strips 2 and 3 in any suitable manner. This bracket is tubular in form at its outer end to receive an insulating bushing 11 in which is mounted the metal terminal piece 12. The upper end of the electrode 7 passes through the bushing 11 and is secured to the metal terminal piece 12 in any suitable manner, as by soldering or the like. The upper end of the electrode 8 encircles the insulating bushing 11 and is attached to the bracket 10 in any suitable manner as by soldering, welding, and the like. The circuit wires to these electrodes are indicated at 13 attached respectively to the terminal piece 12 and the bracket 10 and extending along the top edge of the door at one side within a suitable metal molding piece 14 attached to the door by the screws 15. These wires extend to the control apparatus in any well known manner.

The structure just described comprises, as will be apparent, a complete self-sustaining unit and is detachably secured on the forward edge of the door in any suitable manner. For example, as indicated in the drawing, the forward edge of the door may be provided with a series of spring clips or brackets 16 attached thereto by screws and positioned so as to engage certain of the spacing members 5. In a normal door about six to eight of these brackets are provided. They are so shaped that the associated spacers 5 must be forced down into position against the resistance thereof, thereby locking the unit in place on the door edge.

It will be seen then that whenever it is desired to replace the sensitive edge for any reason it may be lifted off and a new one substituted therefor. There are enough of the spring clips 16 so as to ensure that the structure is firmly and securely attached to the door. To facilitate the guiding of the clips into place their upper ends are converging and rounded as indicated in Figure 4. The width of the clips 16, as is clear from Figure 4, is just equal to the space between the inner faces of the strips 2 and 3 so that when the clips are properly placed on the edge of the door they not only support the structure on the door but position it transversely so as to accurately align it flush with the sides of the door.

It will be apparent to those skilled in the art that the features of this invention may readily be varied in detail without departure from the true scope thereof. I do not, therefore, desire to be strictly limited to this invention but rather to the true scope thereof as defined in the claims granted me.

What I claim is:

1. The combination with a door, of a sensitive edge structure comprising a pair of spaced parallel strips, means for securing the strips together in spaced relation, a flexible housing projecting from the strips and secured thereto, a pair of electrodes mounted in the housing, and a plurality of clips mounted on the edge of the door and positioned to receive adjacent spacing members therein to hold the unit on the door.

2. The combination with a door, of a sensitive edge structure comprising a pair of spaced parallel strips, means for securing the strips together in spaced relation, a flexible housing pro-

jecting from the strips and secured thereto, a pair of electrodes mounted in the housing, and a plurality of clips mounted on the edge of the door and positioned to receive adjacent spacing members therein to hold the unit on the door, said clips spacing the unit so that the sides thereof are flush with the sides of the door.

3. The combination with a door, of a sensitive edge structure comprising a pair of spaced parallel strips, means for securing the strips together in spaced relation, a flexible housing projecting from the strips and secured thereto, a pair of electrodes mounted in the housing, and a plurality of clips mounted on the edge of the door and positioned to receive adjacent spacing members therein to hold the unit on the door, the width of said clips being substantially equal to the spacing between said strips whereby the unit is positioned flush with the sides of the door.

4. The combination as described, comprising a door having a plurality of spring clips mounted on the forward edge thereof and a unitary switch structure comprising a pair of channelled strips, means for securing the strips together in parallel spaced relation, a flexible casing having its edges secured in the channels of the strips, and a pair of cooperating switch members supported in the casing in spaced relation, said securing means engaging said clips to hold the switch structure on the door.

5. The combination as described, comprising a door having a plurality of spring clips mounted on the forward edge thereof and a unitary switch structure comprising a pair of channelled strips, means for securing the strips together in parallel spaced relation, a flexible casing having its edges secured in the channels of the strips, and a pair of electrodes supported in the casing in spaced relation, said switch structure being supported on the door by said clips, said spacing means engaging said clips to hold the unit on the door and aligned flush with the sides thereof.

6. The combination as described, comprising a door having a plurality of spring clips mounted on the forward edge thereof and a unitary switch structure comprising a pair of channelled strips, means for securing the strips together in parallel spaced relation, a flexible casing having its edges secured in the channels of the strips, a pair of electrodes supported in the casing in spaced relation, said switch structure being supported on the door by the engagement of said clips with said securing means, and a resilient cushion member interposed between the edge of the door and the electrodes.

7. The combination as described, comprising a door having a plurality of spring clips mounted on the forward edge thereof and a unitary switch structure comprising a pair of channelled strips, means for securing the strips together in parallel spaced relation, a flexible casing having its edges secured in the channels of the strips, a pair of electrodes supported in the casing in spaced relation, said switch structure being supported on the door by the engagement of said clips with said securing means, and a resilient cushion member interposed between the edge of the door and the electrodes, said cushion member being recessed to increase its flexibility.

8. The combination comprising a door, a plurality of brackets mounted on the front edge of the door, a control device comprising a pair of channelled strips, means for securing the strips together in spaced relation including spacers, a

U-shaped flexible housing member having its free edges secured in the channels of said strips, and a pair of contact members mounted within the housing member, the spacing members engaging said brackets to mount the control device on the door, said brackets lying between the strips and transversely positioning the device on the door.

- 5  
10 9. The combination comprising a door, a plurality of brackets mounted on the front edge of the door, a control device comprising a pair of channelled strips, means for securing the

strips together in spaced relation including spacers, a U-shaped flexible housing member having its free edges secured in the channels of said strips, a pair of contact members mounted within the housing member, the spacing members engaging said brackets to mount the control device on the door, said brackets lying between the strips and transversely positioning the device on the door, and a bar of resilient material extending parallel to the edge of the door and lying between it and the contact members.

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