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CAR DOOR SWITCH CONTROL.

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1,300,320. Patented Apr. 15, 1919.

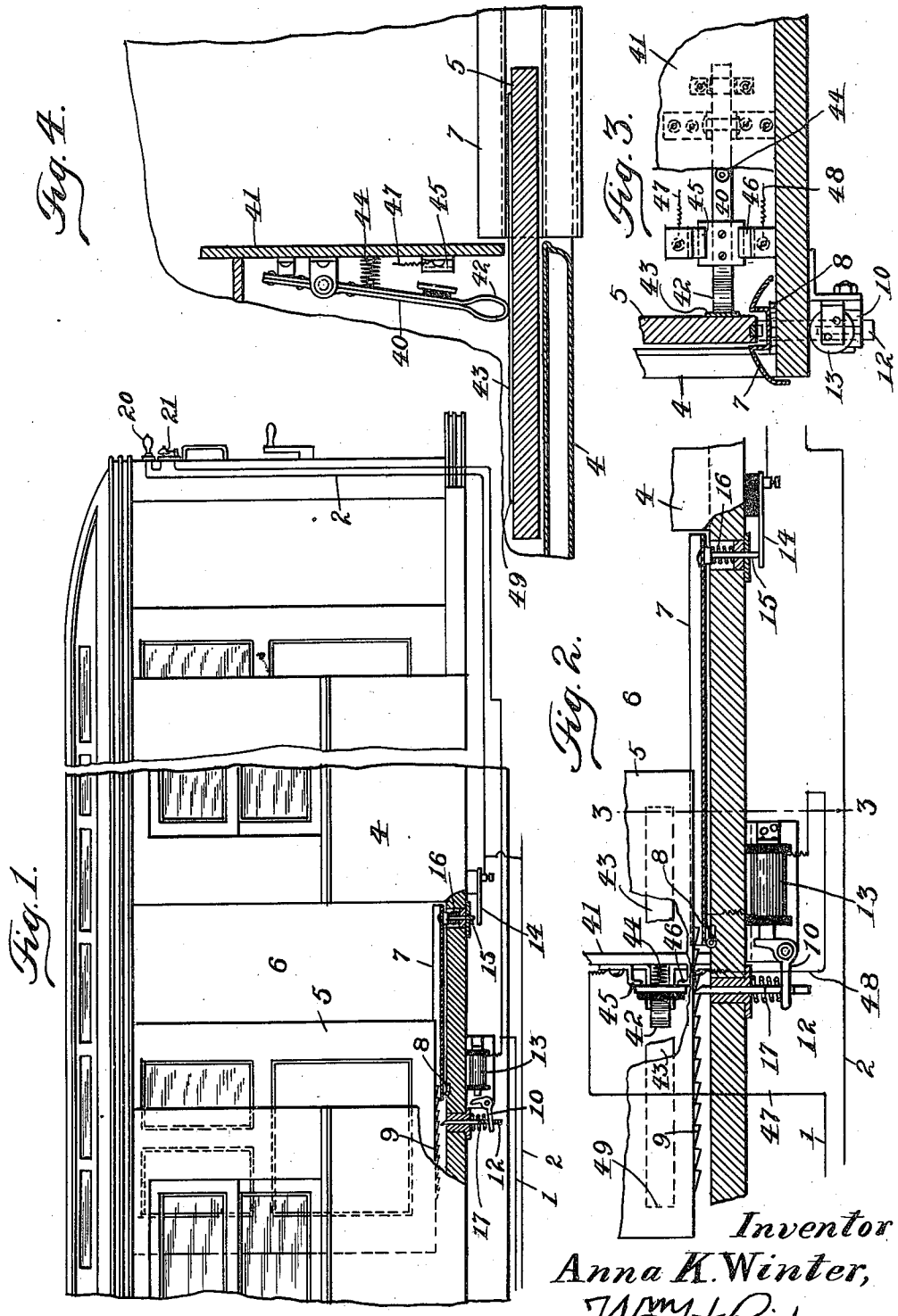


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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CAR-DOOR SWITCH CONTROL.

1,300,320. Specification of Letters Patent. Patented Apr. 15, 1919.

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To all whom it may concern:

Be it known that I, ANNA K. WINTER, a citizen of the United States, and resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Car-Door Switch Controls, of which the following is a specification.

This invention relates to mechanism for arresting the closing movement of a door in a car when a passenger is in the act of passing into or through the doorway, which movement is effected by the passenger stepping on a plate in the doorway.

The object of this invention is to provide means in connection with the said mechanism whereby the opening movement of the door from any position will disable the arresting means, and the closing movement of the door from any position will restore the arresting means to operative position.

A further object of the invention is to arrange such means so that when the door is in the fully closed position the arresting mechanism and connected parts will be disabled.

In the accompanying drawing showing one embodiment of my invention, Figure 1 is a partial side view of a car, broken to show interior construction. Fig. 2 shows some of the parts enlarged. Fig. 3 is a cross section on the line 3—3 of Fig. 2; and Fig. 4 is a horizontal section through the door showing adjacent parts.

This invention is designed for application to the form of mechanism set forth in an application in patent filed by myself, Ser. No. 194,218, and is here set forth as applied to such mechanism.

The car 4 has a sliding door 5 that will close the doorway 6 at one side. A plate 7 is located beneath the door in the closed position and projects beyond the door on each side, see Fig. 3. This plate 7 is hinged at 8 at one end and will be depressed by the passenger stepping on the plate. On the lower edge of the door 5 is a toothed rack 9 having ratchet teeth as shown, and a pawl 10 is pivoted below the car door and carries a spring plunger 12 that will be forced up by the pawl to engage the rack teeth and arrest the closing of the door, but not interfere with the opening movement, because of the inclined teeth. An electromagnet 13 is arranged to attract and swing the pawl 10 when the circuit of the magnet is closed. The circuit of this magnet includes a contact plate 14 and a spring plunger 15 attached to the sill plate 7 as shown. Spring 16 of the plunger keeps the plate raised and the contact normally broken, but when the plate is depressed this circuit is closed and the magnet will shift the plunger 12 to engage the rack. Therefore when the door starts to close and a passenger steps on the plate 7, the plunger 12 will rise and engage the teeth to arrest the door at once. When this circuit is broken the spring 17 will lower the plunger and release the door.

A signal light 20, and a bell 21 are shown arranged in the circuit of the magnet to warn the guard at the end of the car that the sill plate has been depressed by a passenger.

The construction as described so far is similar to that of said patent application and forms no part of the present invention. With the construction therein set forth, if the door is opening and a passenger leaves the car while the door is still opening, and steps on the sill plate 7, the ratchet will engage, and the signal operate; while this will not arrest the door because of the ratchet teeth, it will produce unnecessary operation of the parts. In the present invention I overcome these objections by causing the arresting means to be disabled while the door is opening, but as soon as the door starts to close, from the fully opened position, or from any intermediate position, the arresting means is at once rendered operative, and if the sill plate is depressed, the door will be arrested, and the signals operate.

One means of accomplishing this result, is to provide a switch in the circuit of the magnet 13, and I arrange a switch lever 40 pivoted on a block 41 in the car adjacent the door, so that the end 42 of the switch lever will press against a friction plate 43 secured to the inside of the door, see Fig. 4. A spring 44 serves to normally swing the switch to open the terminals 45 and 46, that connect by wires 47 and 48, with the wires 1 and 2 of the magnet. This end 42 of the lever is resilient, and has a friction engagement with the plate 43. This latter plate is so arranged that when the door is fully closed the end 49 of the plate will pass beyond engagement with the switch lever 40, that will be drawn by its spring to the open position. The opening movement of the door will cause engagement of this plate

with the switch end, that will tend to retain it in this open position. But it will be understood that any movement of the door toward closing will cause the friction plate to shift the switch to the closed position, that will complete the circuit for the magnet at this place, and the switch will remain closed during the closing movement of the door, until the door reaches the fully closed position, when as stated the friction plate will have passed the switch arm, that will be shifted by its spring to open the switch.

From this it follows that a passenger depressing the sill plate when the door is fully closed will not operate the magnet or signals, and the same applies when the door is being opened, or arrives at the opened position. But as soon as any closing movement of the door takes place, either from the fully opened position, or from a partly opened position, this switch is closed, and the arresting means rendered operative. Hence if the door should open part way and a passenger attempting to enter or leave should depress the sill plate, and then the guard should attempt to close the door, this switch will at once close and the arresting means will prevent closing of the door.

What I claim is:

1. In a car, the combination with the side having a doorway and a door slidable to close the doorway, and a sill plate pivoted at the doorway beneath the door so as to be held operatively disposed thereby in its closed position and arranged to be depressed by a passenger when the door is open, and means for arresting the closing movement of the door that is caused by the said depression of the sill plate, of means for disabling said arresting means by the opening movement of the door from any position.

2. In a car, the combination with the side having a doorway and a door slidable to close the doorway, and a sill plate pivoted at the doorway beneath the door so as to be held operatively disposed thereby in its closed position and arranged to be depressed by a passenger when the door is open, and means for arresting the closing movement of the door that is caused by the said depression of the sill plate, of means for disabling said arresting means by the opening movement of the door from any position, and for restoring the said arresting means by the closing movement of the door from any position.

3. In a car, the combination with the side having a doorway and a door slidable to close the doorway, and a sill plate pivoted at the doorway beneath the door so as to be held operatively disposed thereby in its closed position and arranged to be depressed by a passenger when the door is open, and means for arresting the closing movement of the door that is caused by the said depression of the sill plate, of means for disabling said arresting means by the opening movement of the door from any position, and means for disabling the arresting means when the door is fully closed.

4. In a car, the combination with the side having a doorway and a door slidable to close the doorway, and a sill plate pivoted at the doorway beneath the door so as to be held operatively disposed thereby in its closed position and arranged to be depressed by a passenger when the door is open, and means for arresting the closing movement of the door that is caused by the said depression of the sill plate, of means for disabling said arresting means by the opening movement of the door from any position, and for restoring the said arresting means from the closing movement of the door from any position, and means for disabling the arresting means when the door is fully closed.

5. In a car, the combination with the side having a doorway and a door slidable to close the doorway, and a sill plate pivoted at the doorway beneath the door so as to be held operatively disposed thereby in its closed position and arranged to be depressed by a passenger when the door is open, and means for arresting the closing movement of the door that is caused by the said depression of the sill plate, of means for disabling said arresting means by the opening movement of the door from any position, means for disabling the arresting means when the door is fully closed, and means for disabling the arresting means when the door is in the open position.

6. In a car, the combination with the side having a doorway and a door slidable to close the doorway, and a sill plate pivoted at the doorway beneath the door so as to be held operatively disposed thereby in its closed position and arranged to be depressed by a passenger when the door is open, and means for arresting the closing movement of the door that is caused by the said depression of the sill plate, of means for disabling said arresting means by the opening movement of the door from any position, and for restoring the said arresting means by the closing movement of the door from any position, and means for disabling the arresting means when the door is fully closed, and means for disabling the arresting means when the door is in the open position.

7. In a car, the combination with the side having a doorway and a door slidable to close the doorway, of a sill plate pivoted at its inner end in the doorway and beneath the door in its closed position and arranged to be depressed by a passenger when the door is open, means for arresting the closing movement of the door that is caused to operate by the said depression of the sill plate, said means including a contact carried by

the sill plate for closing an electric circuit, an electric switch in said circuit and means for causing the opening movement of the door from any position to open said switch, and to cause the closing movement of the door from any position to close said switch.

8. In a car, the combination with the side having a doorway and a door slidable to close the doorway, of a sill plate pivoted at its inner end in the doorway and beneath the door in its closed position and arranged to be depressed by a passenger when the door is open, means for arresting the closing movement of the door that is caused to operate by the said depression of the sill plate, said means including a contact carried by the sill plate for closing an electric circuit, an electric switch in said circuit, and means for causing the opening movement of the door from any position to open said switch, and to cause the closing movement of the door from any position to close said switch, said means being arranged whereby said switch is opened when the door is fully closed and closed when the door is first retracted from closed position.

9. In a car, the combination with the side having a doorway and a door slidable to close the doorway, of a sill plate pivoted at its inner end in the doorway and beneath the door in its closed position and arranged to be depressed by a passenger when the door is open, means for arresting the closing movement of the door that is caused to operate by the said depression of the sill plate, said means including a contact carried by the sill plate for closing an electric circuit, a friction plate carried by the door, an electric switch arm having its terminals arranged in said circuit, and being movably supported to engage said friction plate, whereby the opening movement of the door from any position will swing the arm to separate its terminals and open said circuit, and the closing movement of the door from any position will swing the arm to close its terminals and said circuit.

10. In a car, the combination with the side having a doorway and a door slidable to close the doorway, of a sill plate pivoted at its inner end in the doorway and beneath the door in its closed position and arranged to be depressed by a passenger when the door is open, means for arresting the closing movement of the door that is caused to operate by the said depression of the sill plate, said means including a contact carried by the sill plate for closing an electric circuit, a friction plate carried by the door, an electric switch arm having its terminals arranged in said circuit, and being movably supported to engage said friction plate, whereby the opening movement of the door from any position will swing the arm to separate its terminals and open said circuit, and the closing movement of the door from any position will swing the arm to close its terminals and said circuit, and a spring arranged to open said switch, said friction plate being free from the switch arm in the closed position of the door, whereby the spring will open the switch.

ANNA K. WINTER.