No. 775,358. PATENTED NOV. 22, 1904.

J. M. WILDERMAN.

STREET CAR FENDER.

APPLICATION FILED MAR. 12, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. I.

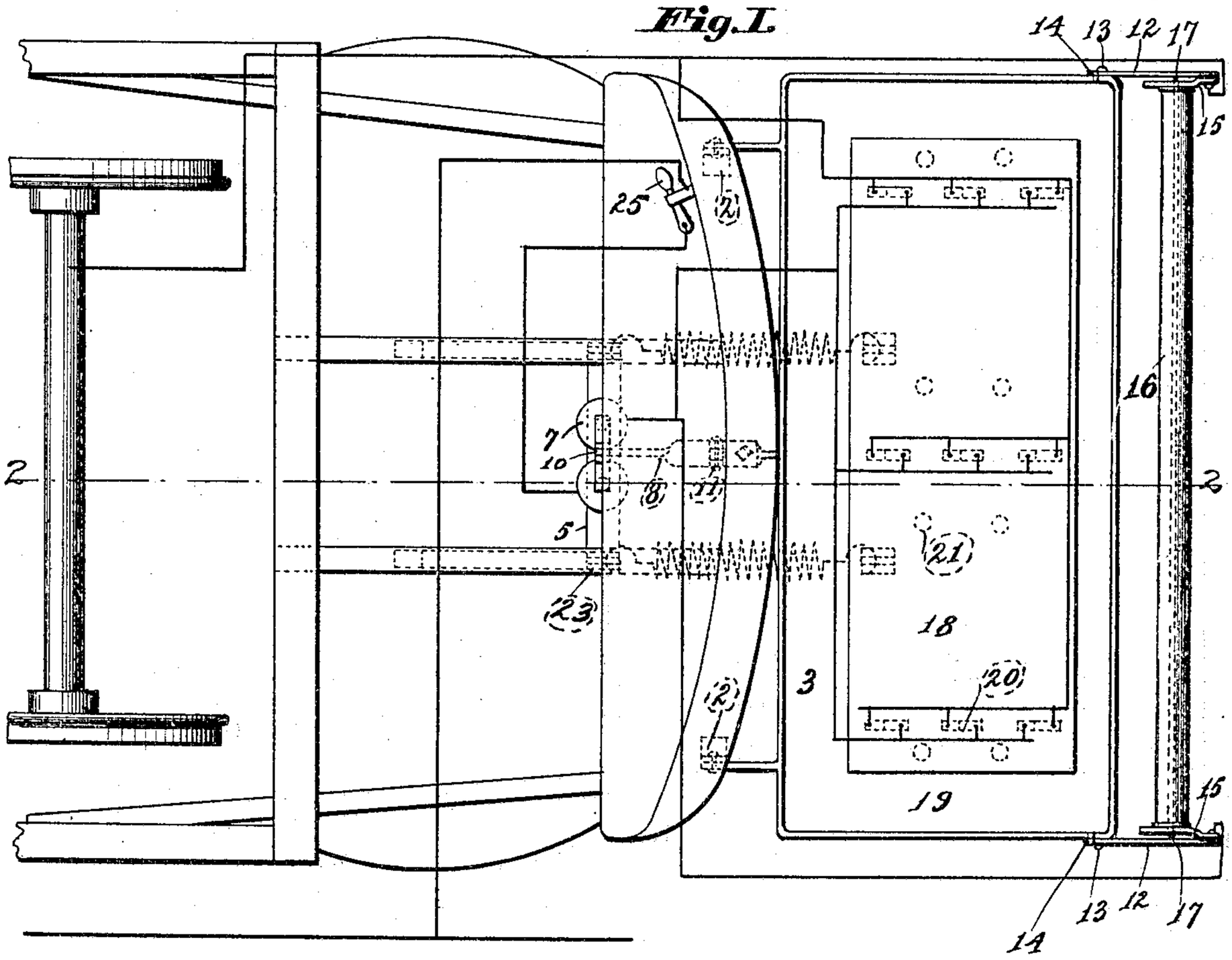
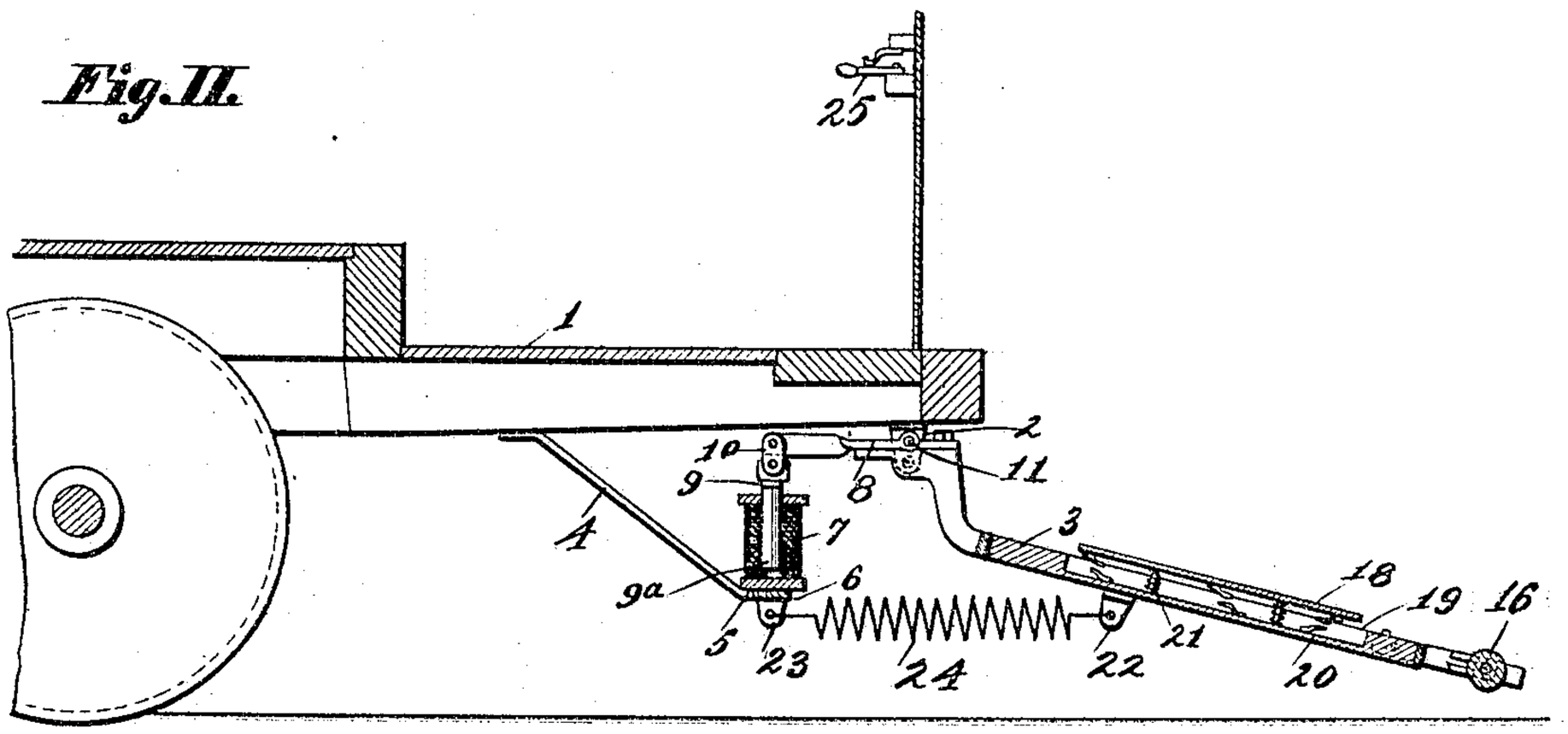


Fig. II.



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STREET CAR FENDER.

APPLICATION FILED MAR. 12, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. III.

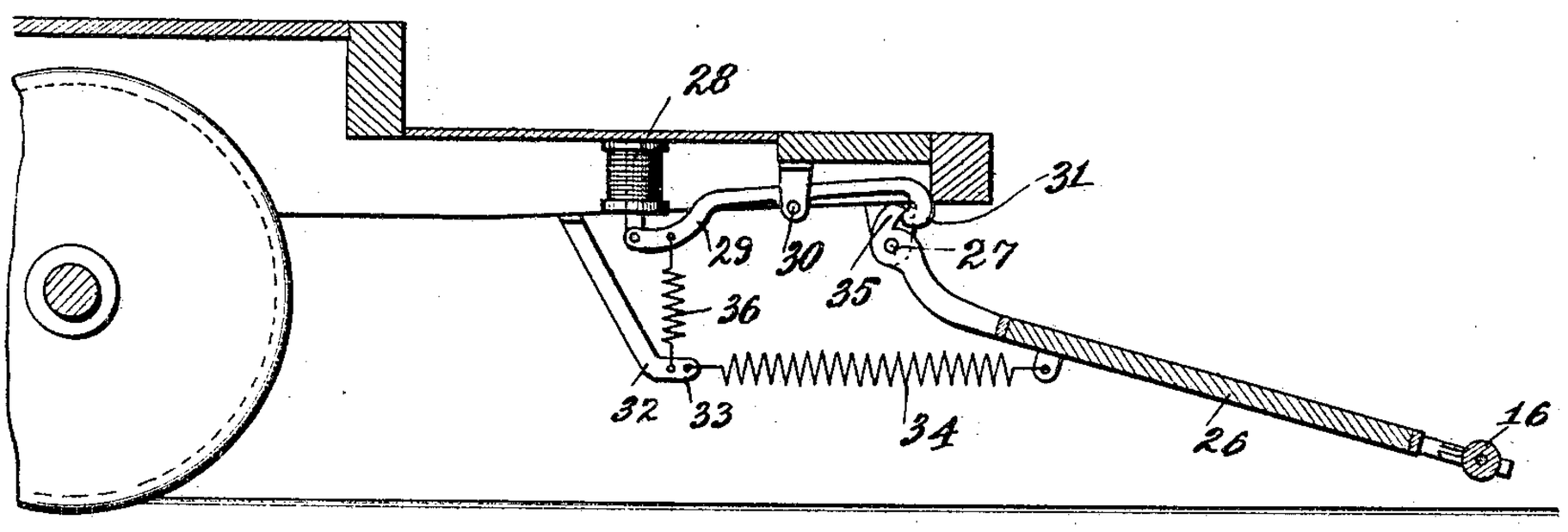
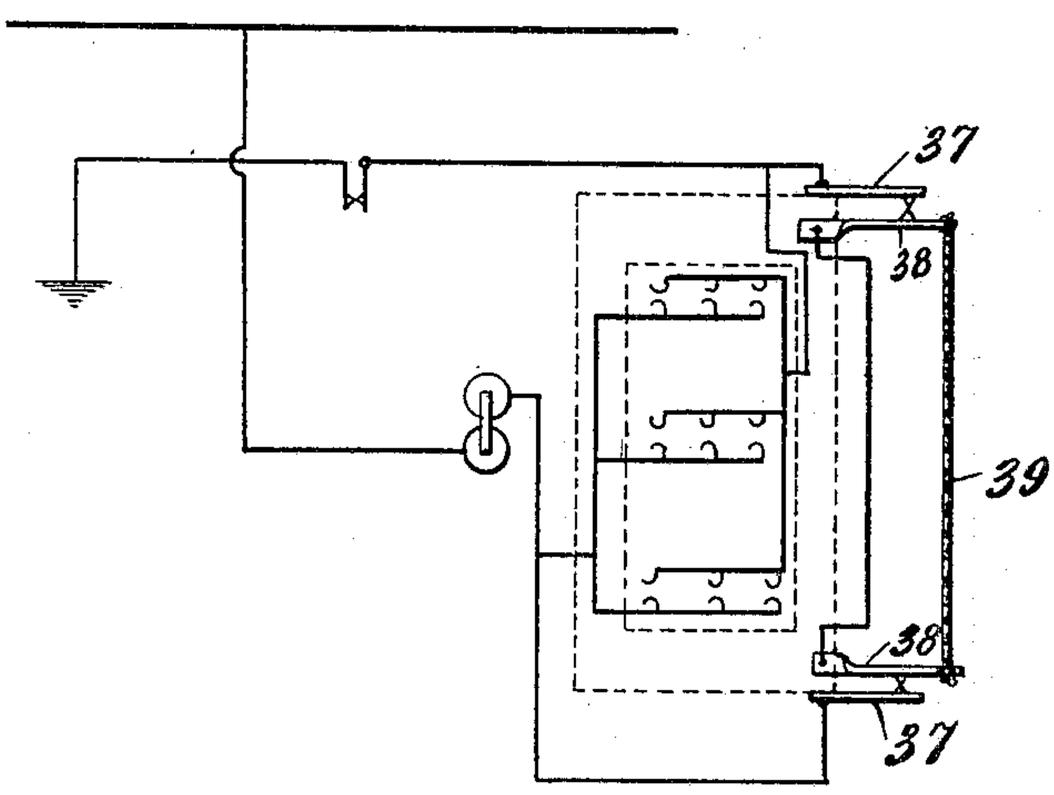


Fig. IV.



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No. 775,358. Patented November 22, 1904.

UNITED STATES PATENT OFFICE.

JOSEPH M. WILDERMAN, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO LOUIS J. RINGE, OF ST. CHARLES, MISSOURI.

STREET-CAR FENDER.

SPECIFICATION forming part of Letters Patent No. 775,358, dated November 22, 1904.

Application filed March 12, 1903. Serial No. 147,371. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. WILDERMAN, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a certain new and useful Improvement in Street-Car Fenders, of which the following is a specification.

My invention relates to street-car fenders; and it consists in the construction hereinafter described and claimed.

In the accompanying drawings, which form part of this invention, and in which like symbols refer to like parts wherever they occur, Figure I is a plan view of the front portion of the car-frame provided with the invention, showing in diagram the path of the electric circuit. Fig. II is a section thereof on the line 2 2 of Fig. I. Fig. III illustrates a modification with the parts shown in section. Fig. IV is a view illustrating a modified means for automatically breaking the circuit, showing the circuit in diagram.

In this invention the under side of the front portion of the platform 1 of an ordinary street-car is provided with brackets 2, to which is hinged a frame 3. This frame extends from one side of the car to the other, so as to entirely cover the track. To the under side of the platform, and preferably near the center thereof, are secured brackets 4, which extend downwardly and forwardly and are connected at their forward ends by a cross-piece 5. Secured to these brackets 4 underneath the cross-piece are brace-rods 6, which are suitably connected at their opposite ends with the lower part of the platform. About midway the ends of the cross-piece 5 is a hollow electromagnet 7. Rigidly secured to the rear part of the platform 3 is an arm 8, extending rearwardly and carrying an armature 9, pivotally connected to the arm 8 by a link 10. To the opposite ends of the armature are secured core-pieces 9^a. The arm 8 may be made of a single piece; but it is preferably made in two parts, which are hinged together, as indicated at 11. By so connecting the arm 8 to the frame and by providing a link connection between the end of the arm and the armature the frame 3 may be swung upwardly on its hinges when desired.

To the forward part of the frame 3 are connected carrier-arms 12, which are preferably hinged to the frame by pivots 13. The downward movement of the ends of these carrier-arms is limited by suitable shoulders 14 on the frame 3, which project over the edge of the rear parts of the extensions back of their pivotal points. Rigidly secured on the inner sides of these carrier-arms 12 and insulated therefrom are plates 15, which have slots therein opening toward the rear. Mounted in these slots is a rod 16, preferably composed of a core 17, of any material suitable for an electric conductor, and an outer covering of wood or the like.

Mounted in the central part of the frame 3 is a movable mat 18, which carries on its under side a series of contact-springs 19, which are adapted to engage other contact-springs 20, arranged below them. These contact-springs are normally separated by helical springs 21, which are placed between the frame 3 and the mat 18. Mounted on the under side of the frame 3 are small brackets 22 and mounted on the under side of the cross-piece 5 are like brackets 23. Connecting these brackets 22 and 23 are spiral springs 24, the purpose of which is to give a positive downward motion to the frame when it is released by the breaking of the electric circuit.

Mounted on the platform 1 in a convenient position to be operated by the motorman is a switch 25, which is normally closed.

The electric circuit is as follows: Beginning with the line-wire the circuit extends through a suitable trolley-pole wire to and through the switch 25, thence through the electromagnet and on through the plate 15 on one side of the fender, thence through the rod 16, the plate 15 on the opposite side of the fender, and thence through the wheels to the ground.

In the operation of the device the parts are normally in the position shown in Figs. I and II. When in the forward motion of the car the rod 16 strikes an obstruction, it is moved out of the slots in the plates 15, and the cir-

cuit is thereby broken. Upon the breaking of the circuit the electromagnet 7 is deënergized, and the spring 24 immediately acts to draw the frame downward upon the track. By such movement the arm 8 is raised, and the core-pieces 9^a are moved upward in the hollow magnets. If the obstruction passes over the front of the frame onto the mat 18 and is of sufficient weight to overcome the helical springs 21, the contact-springs 19 20 will thereby be brought together and the electric circuit will be reëstablished. By thus reëstablishing the circuit the electromagnet is reenergized, and the core-pieces 9^a and the armature 9 are drawn downward, and the frame is lifted.

The core-pieces 9^a provide a means for holding the frame 3 and returning it to its normal position, although it has moved a distance sufficient to practically carry the armature 9 beyond the point where it is materially influenced by the electromagnet. By this means the frame is automatically brought back to its normal position.

In the modification shown in Fig. III the frame is held raised by the electromagnet; but it is held indirectly and not directly, as in the preferred form. In this construction the frame 26 is hinged to the forward part of the platform, as indicated at 27. To the under side of the platform is secured an electromagnet 28, which controls a lever 29, pivoted intermediate its ends, as indicated at 30, to a suitable bracket extending from the platform. The forward part of the lever is provided with a hook 31, which is slightly rounded or wedge-shaped. Extending downwardly from the platform and secured thereto are brackets 32, connected at their forward ends by a cross-piece 33. Connected to the under side of the frame 26 are spiral springs 34, which are connected at their rear ends to the brackets 32. Projecting from the rear part of the frame 26 is a lug 35, which engages the hook 31 on the lever 29. A spiral spring 36 connects the rear end of the lever 29 to the cross-piece. The frame is provided at its forward end with carrier-arms 12 and a removable rod 16, as in the construction shown in Figs. I and II. In the operation of this modified construction when an obstruction comes in contact with the rod 16 the circuit is broken, as above described. When the circuit is broken and the electromagnet 28 is thereby deënergized, the spring 36 pulls down the rear end of the lever 30, which lifts the hook 31 on the inward portion thereof. After the hook 31 is slightly raised the spiral spring 34 is permitted to act to pull the frame 26 downwardly. The hook 31 being rounded or wedge-shaped the lug engages the under side of the wedge after the lever 29 has made a slight movement, and thus the weight of the frame coöperates with the spring 35 to move the lever 29 out of its engaging position. As soon as the obstruction is removed and the rod 16 is replaced in the slots of the plates 15 the circuit is reëstablished. By reëstablishing the circuit the electromagnet is reënergized, and the lever 29 is drawn back into its normal position. The lever 29 being thus restored to its normal position all that is necessary to do to secure the frame 26 in its original position is to lift the same until the lug 35 passes and interlocks with the hook 31.

In both the constructions shown the frame is automatically dropped when it comes in contact with an obstruction; but if it is desired the switch 25 may be manipulated by the motorman to break the circuit and drop the frame. The device thus has the advantage that it can be dropped at will by throwing the switch, or it may be left free to operate automatically upon striking an obstruction.

In Fig. IV is illustrated a different means for automatically breaking the circuit, which may be embodied with either the construction shown in Figs. I and II or the construction shown in Fig. III. In this modification the forward portion of the frame 26 is provided with contact-plates 37, which engage the contact-springs 38, secured to the frame adjacent to the contact-plates 37. In their normal positions these contact members 37 and 38 engage each other, so as to provide a closed circuit. Connecting the far ends of the contact-springs 38 is a flexible cord 39. In this construction when an obstruction strikes the flexible cord 39 the contact-springs 38 are drawn inward toward each other, thus breaking the circuit. When the obstruction is moved out of contact with the flexible cord 39, the contact-springs 38 immediately spring outward and reëstablish the circuit.

The construction herein described admits of considerable modification without departing from my invention, and I do not wish to be restricted to said construction.

What I claim is—

1. A fender comprising a support, a movable frame, connections between the support and the frame whereby the frame may be supported in an upper and in a lower position, an electromagnet to hold the frame in its upper position, and means for deënergizing the magnet.

2. A fender comprising a support, a frame hinged thereto, an armature and connections between the same and the frame, an electromagnet coöperating with said armature to hold the frame raised, and means for deënergizing the magnet, to permit the frame to drop.

3. A fender comprising a support, a frame hinged thereto, an armature and connections between the armature and the frame, an electromagnet coöperating with said armature to hold the frame raised, means for deënergizing the magnet and means for giving the frame a positive downward motion.

4. A fender comprising a support, a frame

hinged thereto, an armature and connections between the armature and the frame, an electromagnet coöperating with said armature to hold the frame raised, and means in position to be operated by an obstruction for automatically breaking the circuit to deënergize the magnet.

5. A fender comprising a support, a frame hinged thereto, an armature and connections between the armature and the frame, an electromagnet coöperating with said armature to hold the frame raised, means for deënergizing the magnet to permit the frame to drop, and means whereby when the magnet is again energized the frame will be raised to its initial position.

6. A fender comprising a support, a frame hinged thereto, an armature provided with core-pieces, a hollow electromagnet, connections between the frame and the armature to hold the frame raised, and means for deënergizing the magnet.

7. A fender comprising a support, a frame hinged thereto, an armature provided with core-pieces and connected to the frame, a hollow electromagnet, means for automatically deënergizing the magnet and permitting the frame to drop, and means for automatically reënergizing the magnet to raise the frame.

8. A fender comprising a support, a frame hinged thereto, an electromagnet, connections between the frame and magnet to hold the frame raised, means for automatically deënergizing the magnet to permit the frame to drop, and means for automatically returning the holding connections to their original positions when the magnet is reënergized,

9. A fender comprising a support, a frame hinged thereto, an electromagnet having a normally closed circuit comprising a part movably mounted on the front of the frame to break the circuit when moved out of its normal position, and means coöperating with the electromagnet to hold the frame raised when the circuit is closed.

10. A fender comprising a support, a frame hinged thereto, an electromagnet having a normally closed circuit, a part movably mounted on the front of the frame to break the circuit when moved out of its normal position to permit the frame to drop, means coöperating with the electromagnet to hold the frame raised when the circuit is closed, and means for reestablishing the circuit to return the frame-holding means to normal position.

11. A fender comprising a support, a frame hinged thereto, electromagnetic means for holding the frame in an upper position, means in position to be operated by an obstruction for automatically breaking the electric circuit and permitting its frame to drop, and means for reëstablishing the circuit and raising the frame by the presence of the object on the frame.

12. A fender comprising a support, a frame hinged thereto, carrier-arms on the front of said frame and extending forwardly, an electromagnet on the support, connections between the electromagnet and the frame to hold the frame raised, a rod movably mounted in said carrier-arms to normally close the magnet-circuit and to break the circuit when moved out of its normal position.

13. A fender comprising a support, a frame hinged thereto, carrier-arms on the front part of said frame and extending forwardly, an electromagnet on the support, an arm secured to the rear of the frame and carrying an armature, a rod movably mounted in said carrier-arms to normally close the magnet-circuit and to break the circuit when moved out of its normal position.

14. In a life-guard for tram-cars and other electrically-propelled vehicles, the combination with a guard or fender adapted to fall into operating position, of electromagnetic means for normally holding it up by magnetic pull, a feeler and a switch device adapted to be actuated by a backward movement of the feeler to cut out and deënergize the electromagnetic means thereby allowing the fender to drop, substantially as described.

15. In a life-guard for tram-cars and other electrically-propelled vehicles, the combination with a guard or fender adapted to fall into operating position, of solenoids having movable cores connected to the fender, an electric circuit through said solenoids to energize same and normally hold up the fender, a feeler, and a switch device adapted to be actuated by a backward movement of the feeler to cut out and deënergize the solenoids thereby allowing the fender to drop, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOS. M. WILDERMAN

Witnesses:
JAMES A. CARR,
JULIA B. MEGOWN.