

No. 753,341.

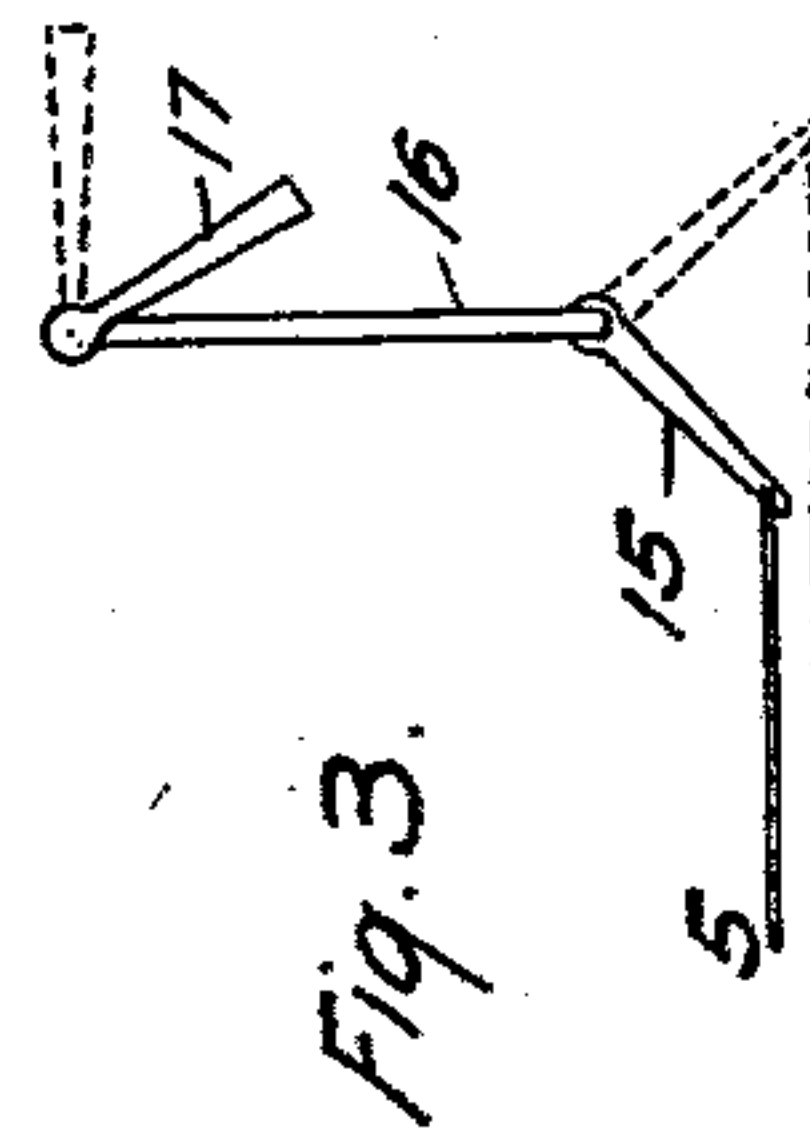
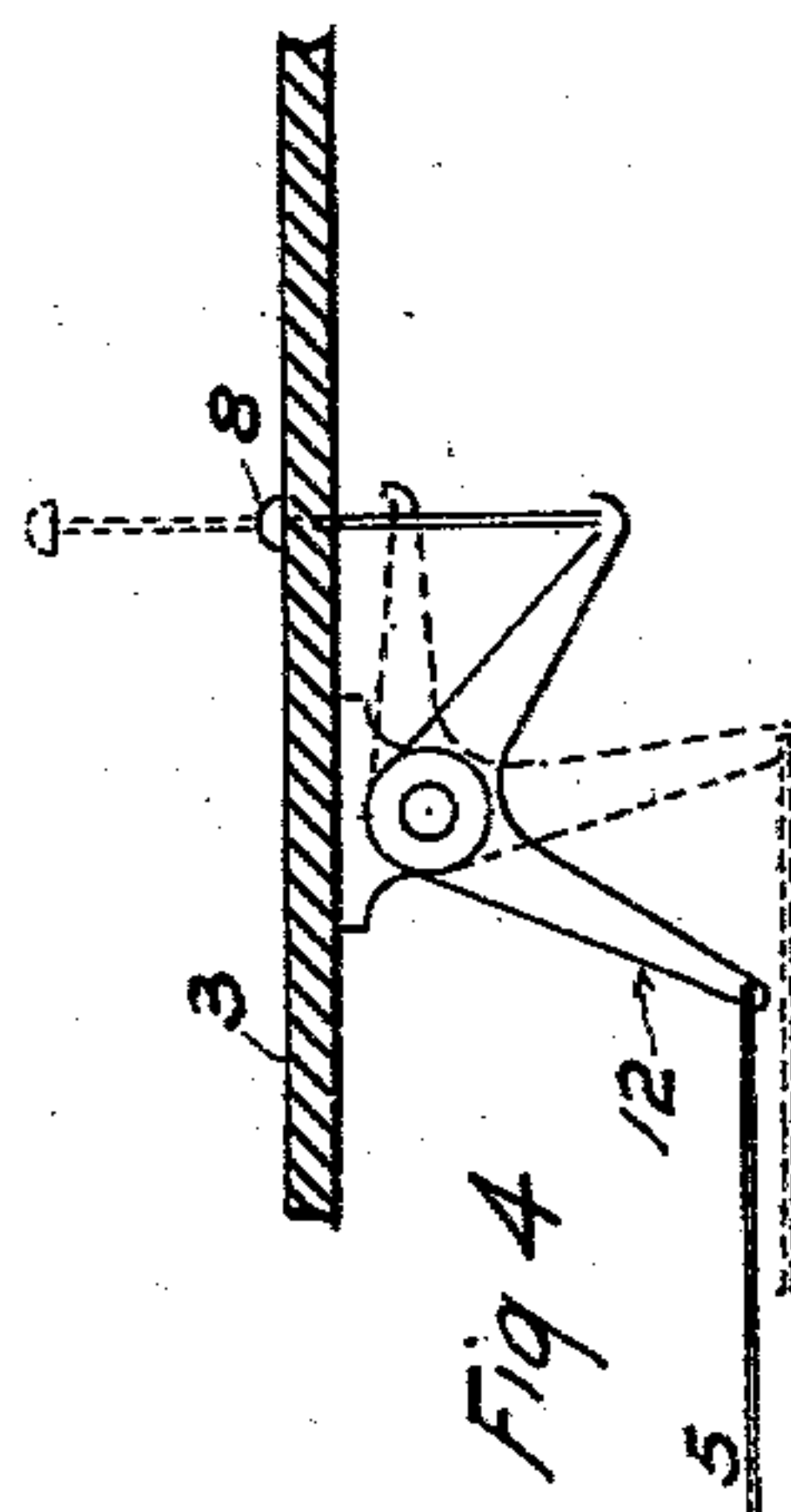
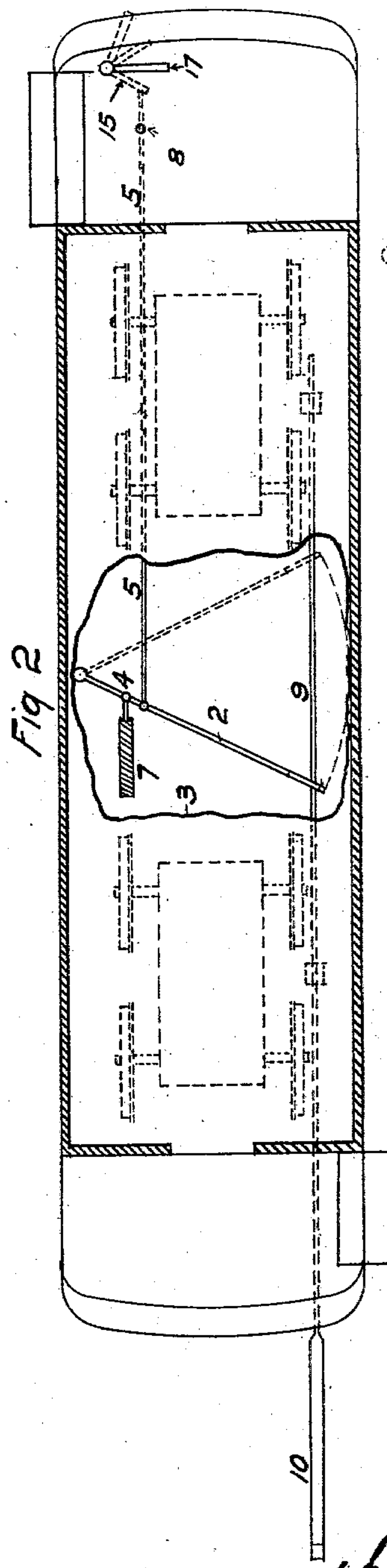
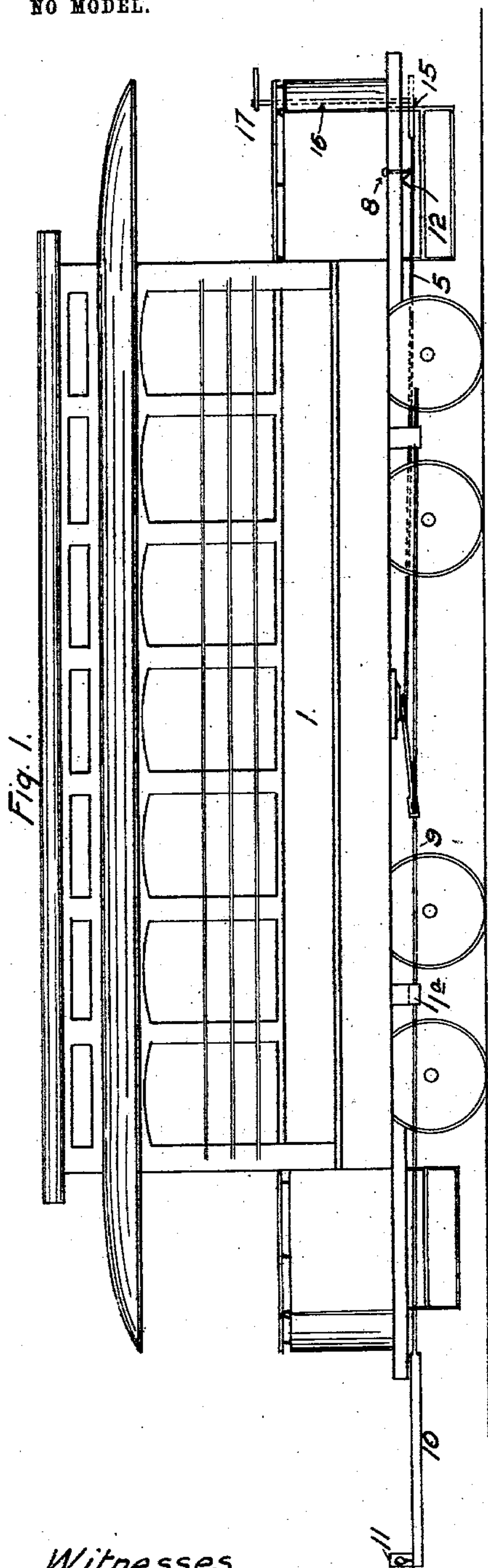
PATENTED MAR. 1, 1904.

C. A. WILLARD.
SAFETY GUARD ON ELECTRICAL CARS.

APPLICATION FILED JAN. 29, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses

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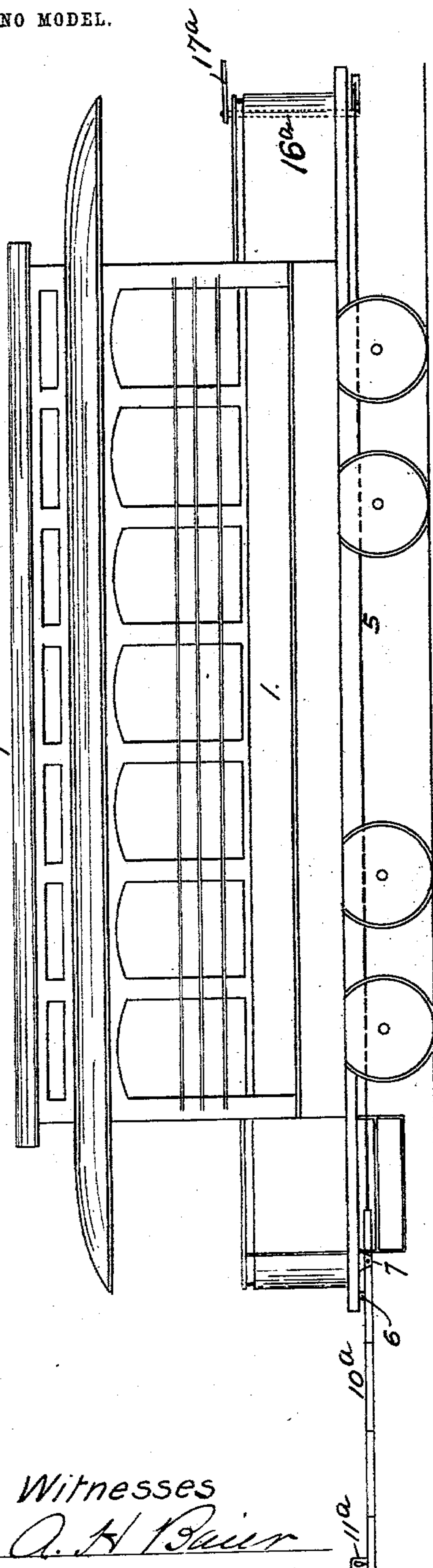
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3 SHEETS—SHEET 2.

Fig. 5.



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Fig. 6.

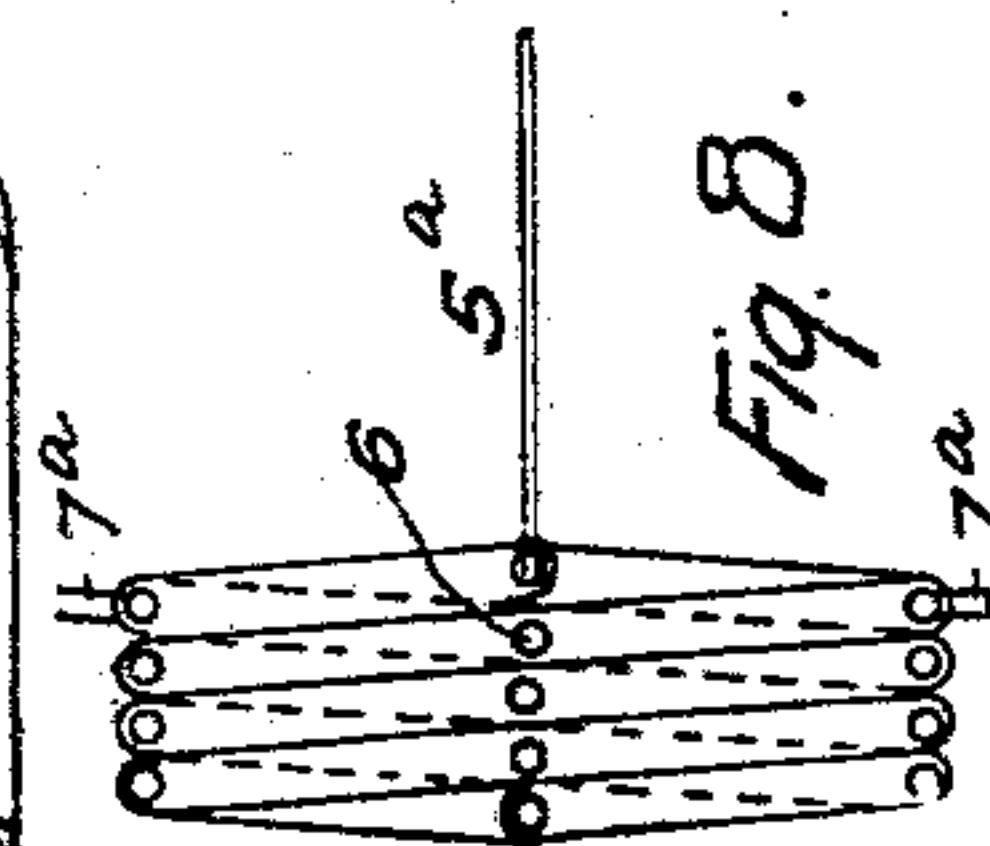
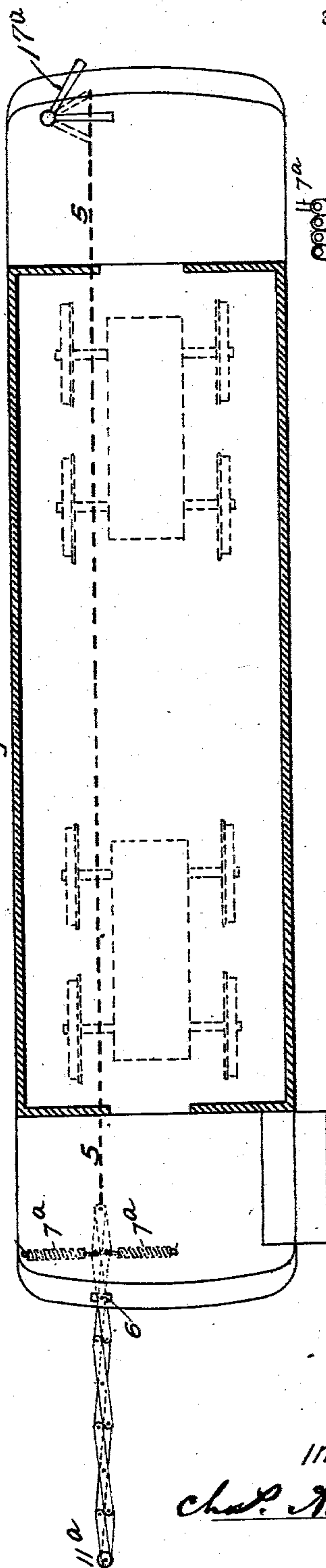


Fig. 8.

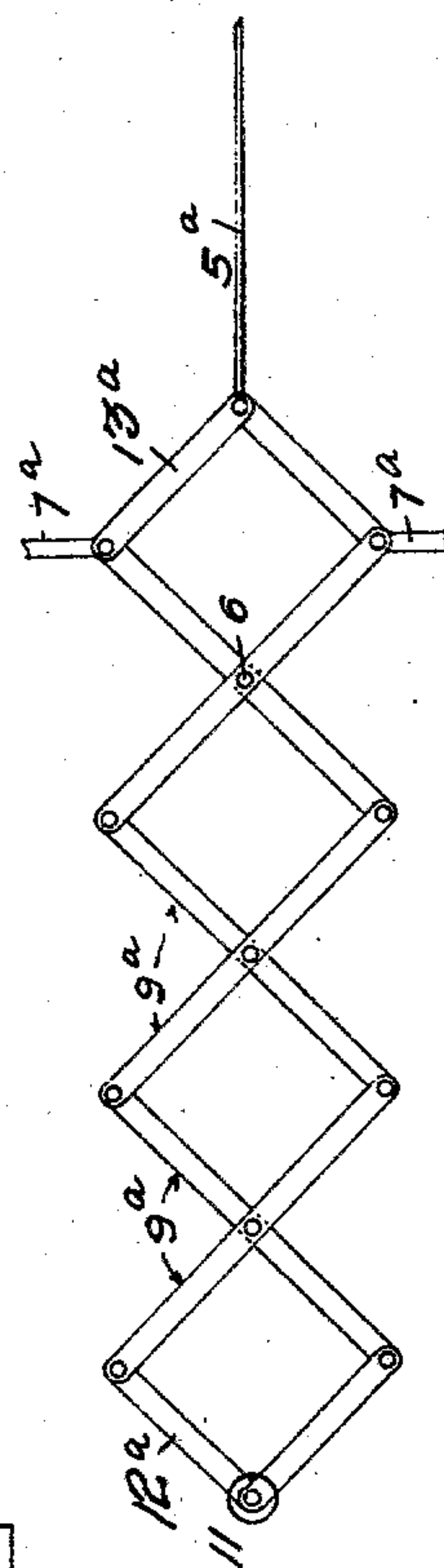


Fig. 7.

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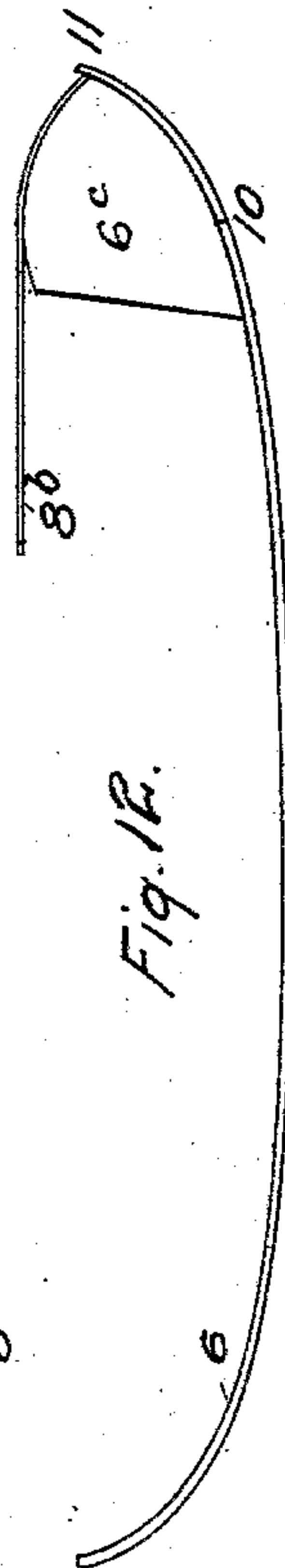
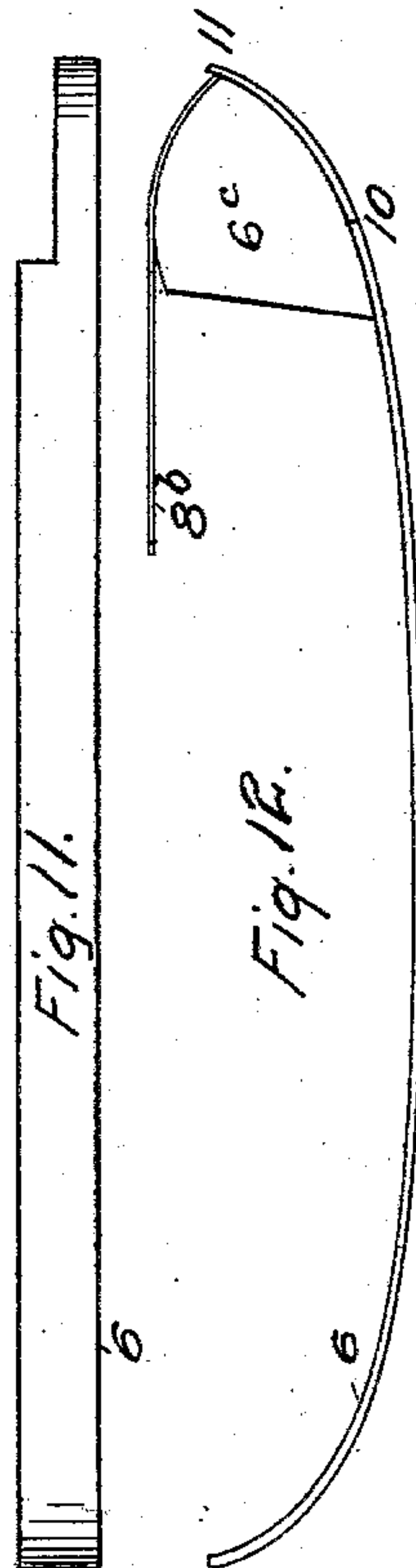
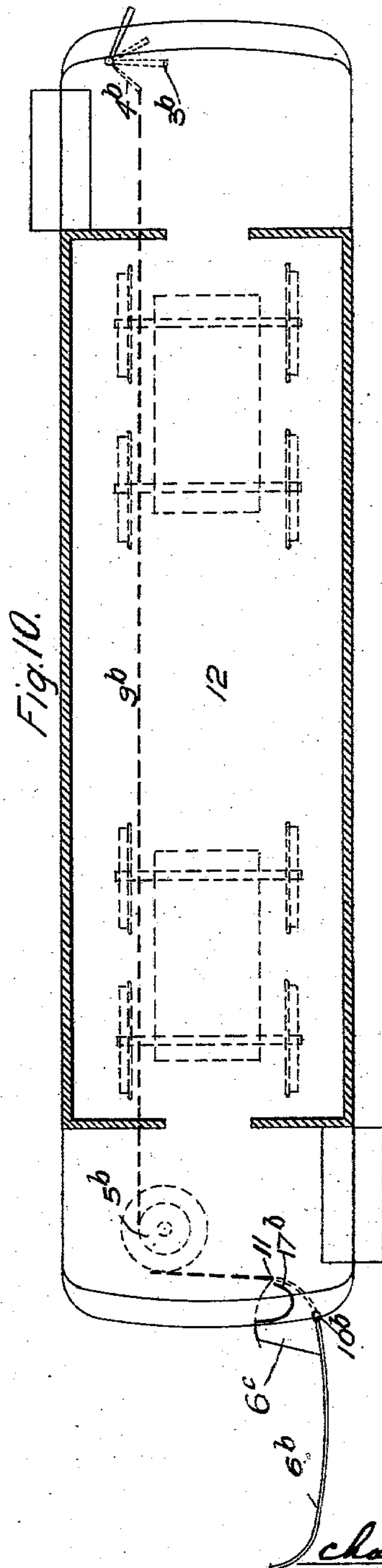
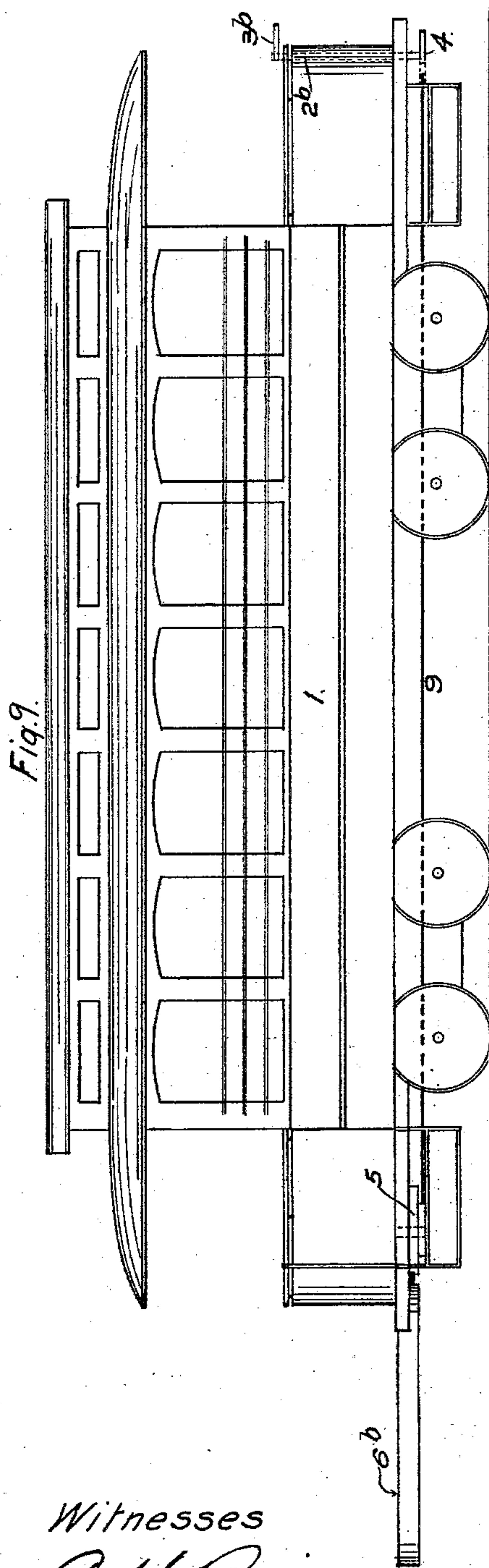
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NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES A. WILLARD, OF ST. LOUIS, MISSOURI.

SAFETY-GUARD ON ELECTRICAL CARS.

SPECIFICATION forming part of Letters Patent No. 753,341, dated March 1, 1904.

Application filed January 29, 1902. Serial No. 91,750. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. WILLARD, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Electrical Car-Signals and Safety-Guards; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to safety-guards or fenders for cars, and especially to that class of devices represented in Letters Patent No. 693,935, granted to me February 25, 1902, in which a safety-guard operated by suitable mechanism controlled by the motorman is moved to an obstructing position in rear of the car to prevent passengers upon alighting from the car passing around the same in front of a car approaching on the adjacent track, the guard to be returned to its normal unobstructing position after the danger has passed.

The objects of the present invention are to produce a simplified form of the device which will operate to efficiently perform its functions and which may be readily applied to and operated upon any class of cars, whether operated by electricity or otherwise.

To these ends the invention comprises the combination with a car of a safety-guard carried thereby, mechanical means operable independently of the brake-actuating means to move the guard to an obstructing position, and means adapted to automatically return the same to its normal unobstructing position.

The invention further consists of the details of construction and combination of parts hereinafter described.

In the drawings, Figure 1 is a side elevation of a car provided with a safety-guard constructed in accordance with this invention. Fig. 2 is a horizontal sectional view of the same, the bottom of the car being partly broken away to illustrate the construction more clearly. Fig. 3 is a detail view illustrating the construction of the hand-lever for operating the safety-guard. Fig. 4 is a similar view of a foot-operated lever. Fig. 5 is a side elevation of a car provided with another form

of safety-guard. Fig. 6 is a horizontal sectional view of the same. Figs. 7 and 8 are detail views of the safety-guard shown in Figs. 5 and 6. Fig. 9 is a side elevation of a car, showing another modification of the invention. Fig. 10 is a horizontal sectional view of the same. Figs. 11 and 12 are detail views illustrating the construction of the safety-guard shown in Figs. 9 and 10.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates an electric car having pivoted to one side of it at a point approximately opposite its center one end of a transversely-disposed lever 2, and the other end of the latter is connected with a longitudinally-movable rod 9, which is slidably supported by suitable guides or hangers 1^a of the car. The guides or hangers depend from the bottom of the car, as clearly shown in Fig. 1 of the drawings, and the slidable rack 9 forms a shank or stem for a longitudinally-reciprocating guard 10. The guard 10, which is shown extended in full lines in Fig. 2 of the drawings, is normally maintained in the position illustrated in dotted lines in the said figure by a coiled spring 7, connected at one end with the car and at its other end with the transverse lever 2, adjacent to the pivoted end thereof and adapted to be compressed when the transverse lever is operated to project the safety-guard. When the guard is free to move, the spring will automatically return it to its initial position. The lever is connected by a rod 5 with a lower arm 15 of a vertical shaft 16, mounted in suitable guides at the platform of the car and provided at its upper end with a suitable handle adapted to be oscillated to partially rotate the shaft and extend the safety-guard. The rod 5 may be connected with one arm of a crank-lever 12, fulcrumed at its angle on the car and having its other arm arranged beneath a vertically-movable pin 8. The pin is held normally elevated by means of the spring 7 and is adapted to be depressed by the foot of the motorman. Either or both of these operating devices may be provided. The spring may be mounted in any desired

manner, and it can be arranged for reversing the operation, so that the guard will be automatically extended by the spring when the parts are free to move. The horizontally-movable safety-guard 10 is designed to be provided at its outer end with an electric bulb 11, which may be connected to a lighting-switch by any suitable electric wires.

In Figs. 5 to 8, inclusive, is illustrated another form of the invention in which a lazy-tongs frame is employed to form the safety-guard 10^a. The lazy-tongs frame is composed of intermediate bars 9^a, arranged in pairs and pivotally connected between their ends to form levers and inner and outer end bars or links. The levers are pivotally connected at their adjacent ends, and the links 12^a and 13^a are pivoted to the ends of the adjacent levers. The lazy-tongs frame is pivoted to the car adjacent to its inner end at 6, and the inner links 13^a are pivoted to a connecting-rod 5^a, which may be operated by a vertical shaft 16^a and a hand-lever 17^a, similar to those heretofore described. The lazy-tongs frame is automatically returned to its folded position by a pair of coiled springs 7^a, located at opposite sides of the inner portion of the safety-guard and secured at their outer ends to the car and connected with the lazy-tongs frame at the rear ends of the innermost bars 9 at the points of connection of the same with the inner links 13^a. When the rod 5^a is moved forward, the lazy-tongs frame will be projected from the rear of the car, and the coiled springs will be distended, whereby when the operating mechanism is released the springs will automatically return the safety-guard to its folded position. Instead of operating the guide by the shaft and hand-lever the foot-lever heretofore described may be used.

The safety-guard is provided at its outer end with an electric bulb 11^a, which is designed to be connected by suitable wires with a lighting-switch, and in practice the slack of the wires caused by the folding of the safety-guard will be automatically taken up by a spring-actuated spool or drum.

In Figs. 9 to 12 of the drawings is illustrated another form of the invention, in which the safety-guard 6^b is pivoted adjacent to one end at 10^b to the end of the car and is adapted to swing horizontally inward and outward to carry it from its folded or retracted position to its extended position. (Shown in Figs. 1 and 2.) The safety-guard 6^b is curved to conform to the configuration of the end of a car, and its inner pivoted end is provided with an arm consisting of a plate 6^c, having a curved edge adapted to receive a flexible connection 8^b, which extends to a pulley 5^b, having two pulley-faces of different diameters. The flexible connection 8^b is attached to the outer edge of the pulley 5^b, and the smaller pulley-face receives a flexible connection 9^b, which extends to a lower arm 4^b of a vertical shaft 2^b.

The vertical shaft 2^b is constructed similar to those heretofore described and is provided at its upper end with a handle 3^b; but any other form of operating mechanism may be employed. The guard is automatically returned to its folded position by a spring 17^b, connected with the car and with the pivoted end of the guard.

It will be seen that the safety-guards are exceedingly simple and inexpensive in construction, that they are adapted to be readily projected from the rear end of a car by a motor-man at the front end of the car to warn passengers alighting from the rear end of the approach of a car on the other track. It will also be apparent that when the safety-guard is not in use it is folded out of the way at the bottom of the car.

I am aware that it is old, as disclosed by my Patent No. 693,935 above referred to, to employ a solenoid for operating a safety-guard, a guard so operated being especially adapted for use upon cars in which electricity is employed as the motive power. I am also aware that it is old to equip the front of a locomotive with a net adapted to be opened by suitable means to gather up a person from the track and means to positively close the same. To such constructions I lay no claim in the present application; but what I do believe myself to be entitled to and desire to claim, broadly, is a guard moved to its obstructing position by mechanical means, as distinguished from a solenoid, and automatically returned to its normal unobstructing position.

What I claim is—

1. The combination with a car, of a safety-guard carried thereby, mechanical means operable independently of the brake-actuating means to move the guard to its obstructing position, and means adapted to automatically return the same to its normal unobstructing position.

2. The combination with a car, of a safety-guard carried thereby and adapted to normally occupy an unobstructing position beneath the rear end of the car, mechanical means operable independently of the brake-actuating means to move the guard to its obstructing position beyond the car, and means adapted to automatically return the same to its normal unobstructing position.

3. The combination with a car, of a safety-guard carried thereby and adapted to normally lie beneath the car and to be projected beyond the same, of mechanical means operable independently of the brake-actuating means to project the guard, and means adapted to automatically return the same to normal position.

4. The combination with a car, of a safety-guard carried thereby and adapted to normally lie beneath the rear end of the car and to be projected beyond the same, of mechanical means operable independently of the brake-actuating means to project the guard, and

means for automatically returning the same to normal position.

5 The combination with a car, of a safety-guard carried thereby, a lever, operative connections between the lever and guard, said lever and connections adapted to be operated independently of the brake-operating means to move the guard to an obstructing position beyond the car, and means for automatically returning the guard to its normal unob-
10 structing position.

6. The combination with a car, of a safety-guard carried beneath the same and adapted to be projected beyond the car, a lever, operative connections between the lever and guard, said lever and connections adapted to be operated independently of the brake-actuating means to project the guard, and means for automatically returning the same to normal
15 position.

7. The combination with a car, of a guard carried beneath the rear end of the same and adapted to be projected beyond the car, a lever, operative connections between the lever and guard, said lever and connections adapted to be operated independently of the brake-actuating means to project the guard, and a
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spring for automatically returning the same to normal position.

8. The combination with a car, of a lazy-tongs frame pivotally connected thereto and adapted to be projected beyond the car, means operatively connected with the inner end of the lazy-tongs adapted to project the same, and means for automatically returning the same to
30 normal position.

9. The combination with a car, of a lazy-tongs frame pivotally connected thereto and adapted to be projected beyond the car, a lever, operative connections between the lever and lazy-tongs for projecting the same, and means for automatically returning the same to normal
35 position.

10. A device of the class described comprising a safety-guard consisting of a lazy-tongs frame, a pair of oppositely-disposed springs connected with the lazy-tongs frame and adapted to fold the lazy-tongs frame automatically, and means for extending the frame, substantially as described.
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Witnesses:

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