(No Model.) 2 Sheets—Sheet 1.

W. E. MEAGHER & A. HOWARTH.

SWITCH ATTACHMENT FOR CARS.

No. 483,744. Patented Oct. 4, 1892.

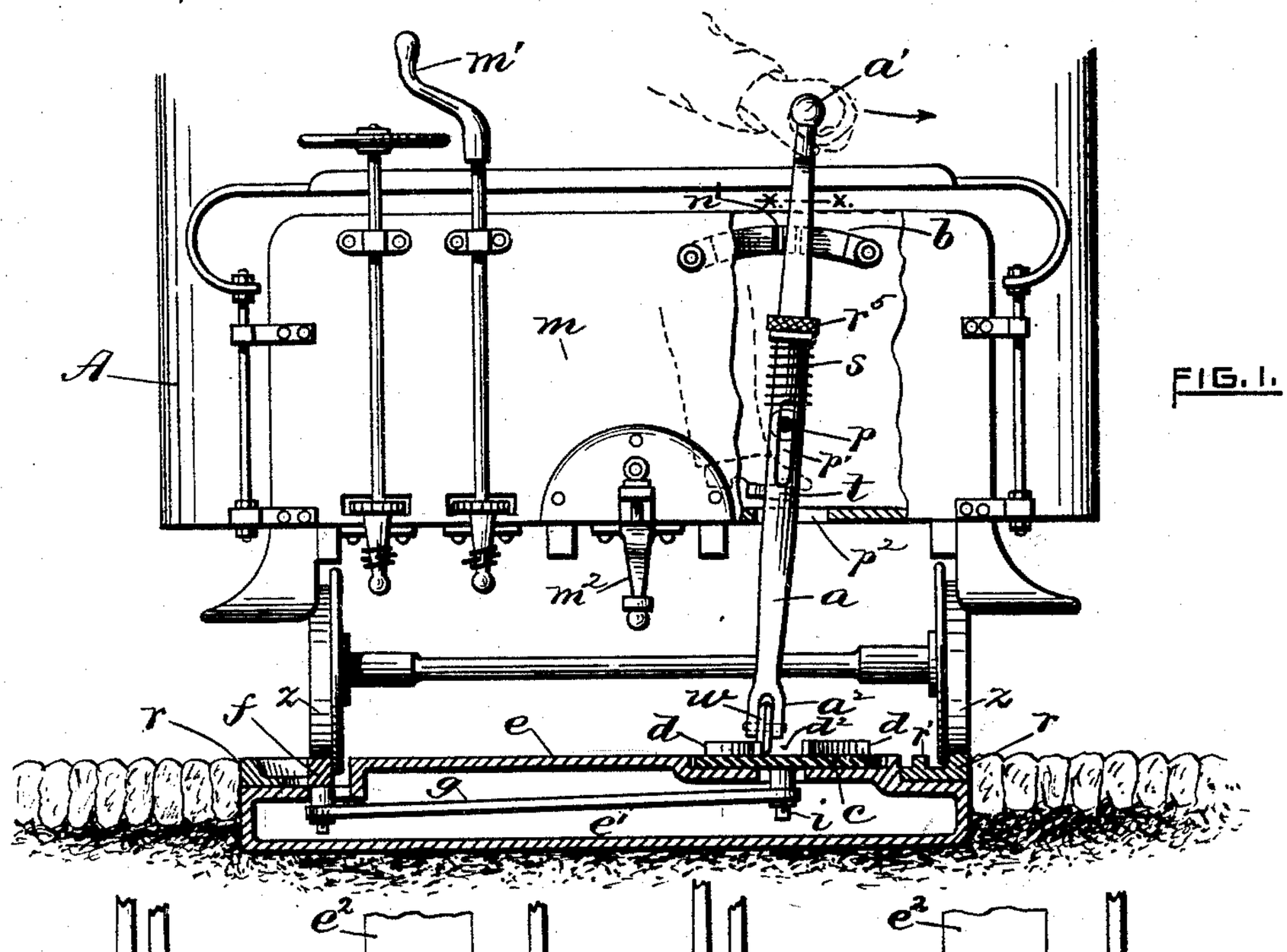

FIG. 1.

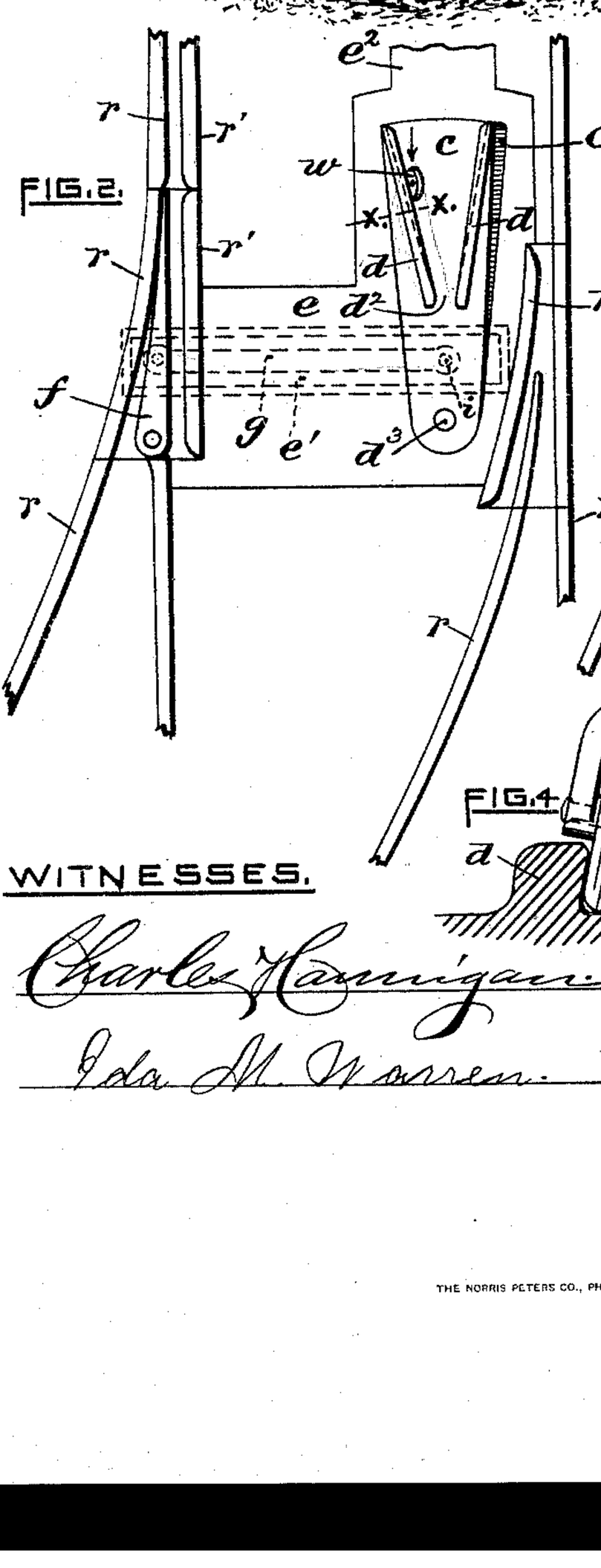

FIG. 2.

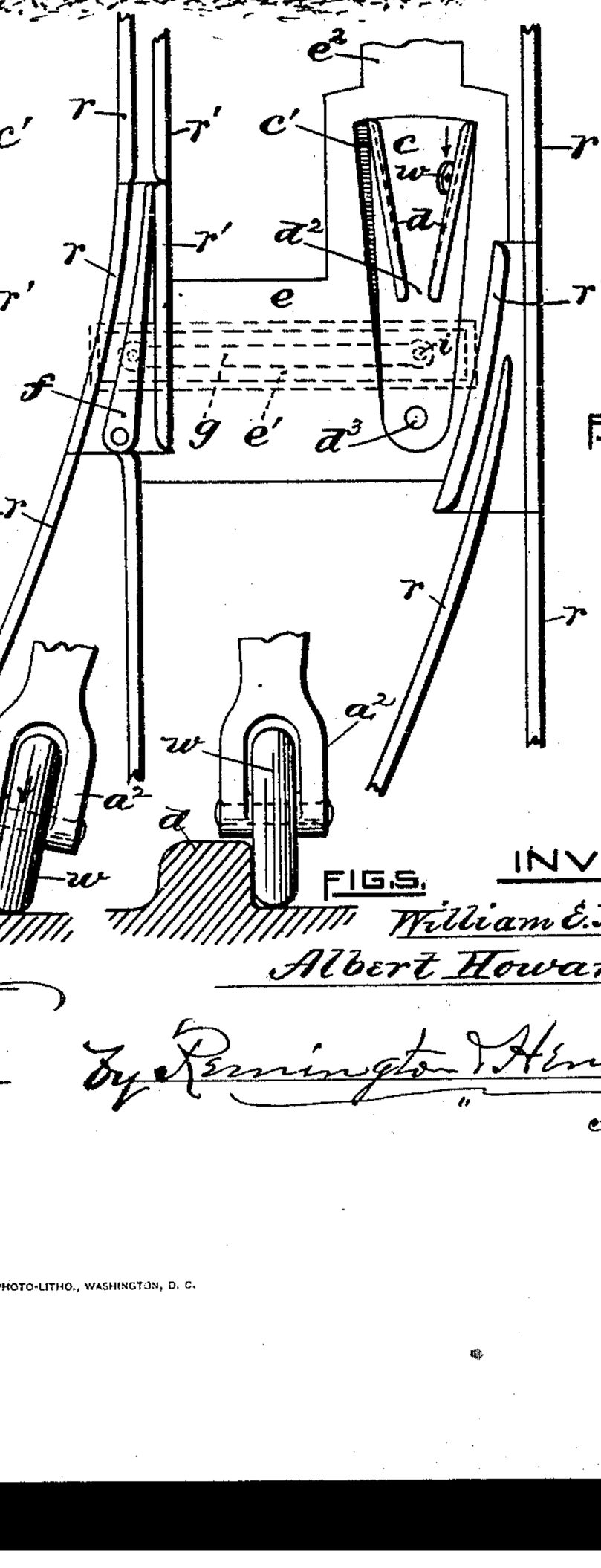

FIG. 3.

FIG. 4.

FIG. 5.

WITNESSES.

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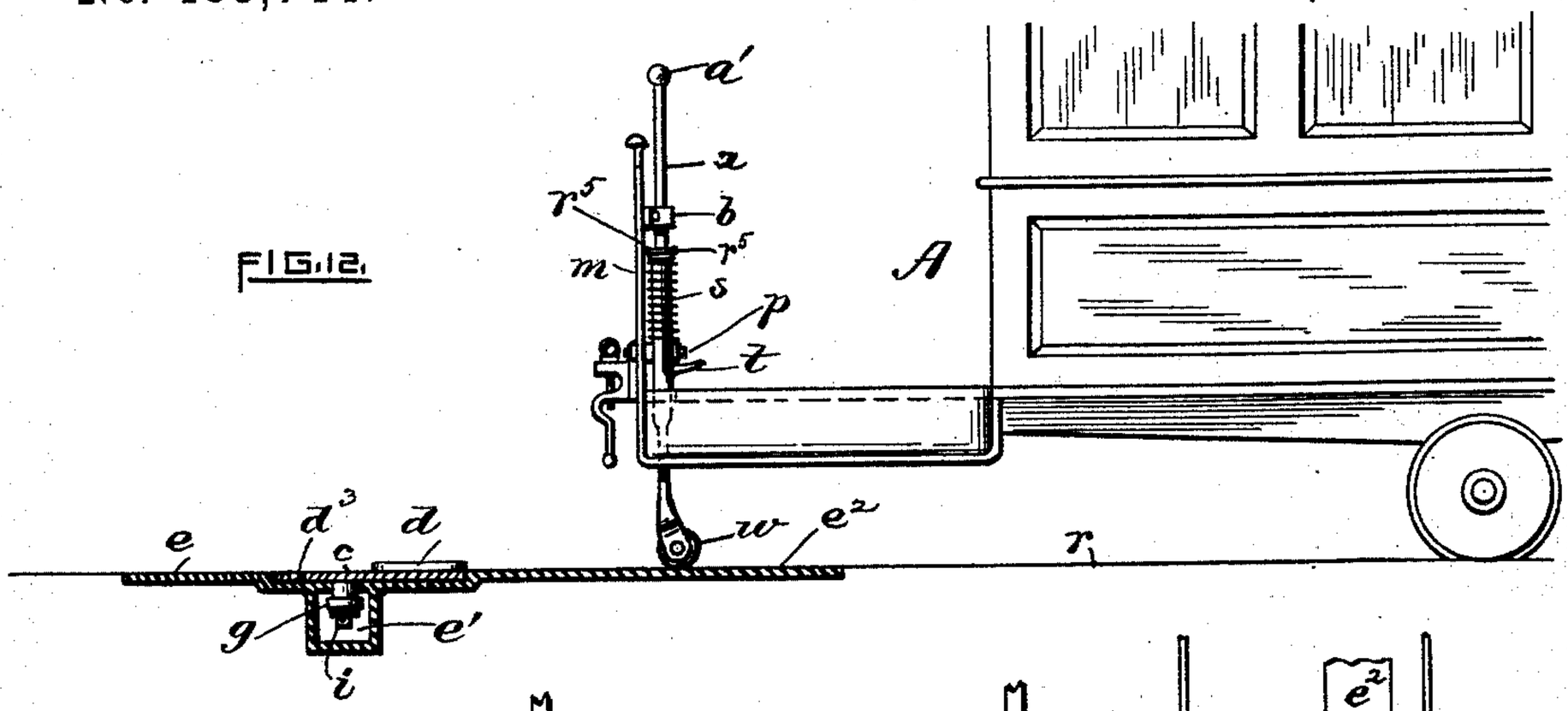
FIG. 12.



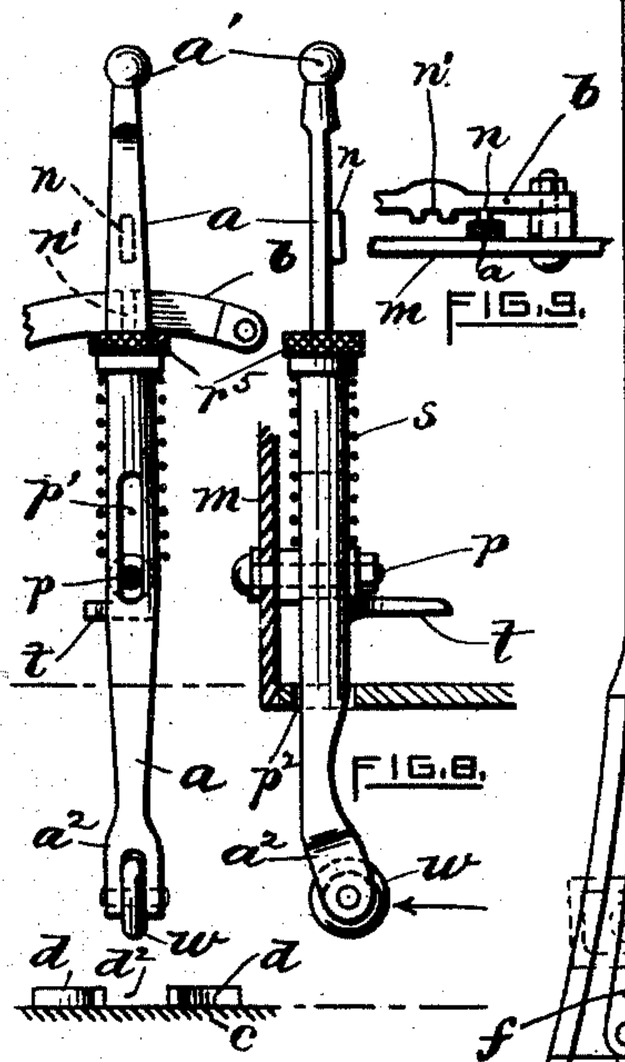


FIG. 7.

FIG. 9.

FIG. 8.

FIG. 6.

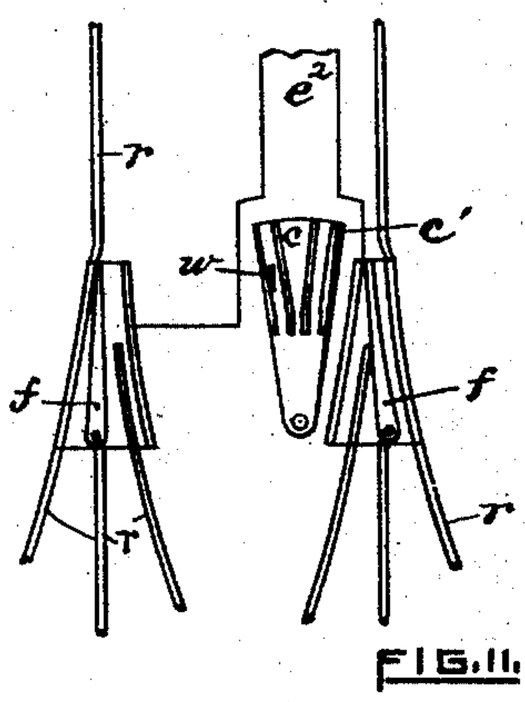


FIG. 11.

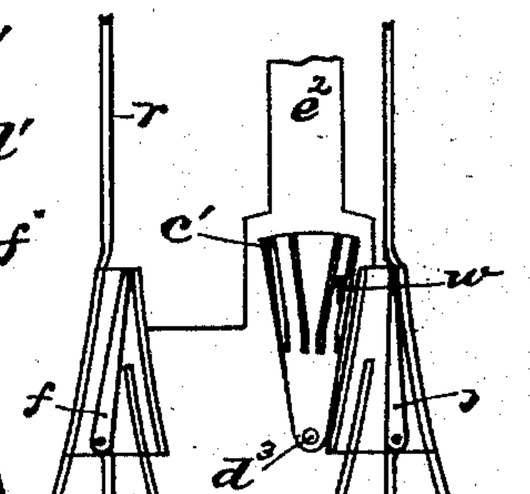


FIG. 10.

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UNITED STATES PATENT OFFICE.

WILLIAM E. MEAGHER AND ALBERT HOWARTH, OF PROVIDENCE, RHODE ISLAND.

SWITCH ATTACHMENT FOR CARS.

SPECIFICATION forming part of Letters Patent No. 483,744, dated October 4, 1892.

Application filed January 20, 1892. Serial No. 418,648. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. MEAGHER, a citizen of the United States, and ALBERT HOWARTH, a subject of the Queen of Great Britain, both residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Railway-Switches; and we do hereby 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to a device for operating rail or track switches for tramway or other cars; and it consists, essentially, of a movable surface guide-plate jointed to the switch-tongue proper, in combination with a vertically and laterally movable operating-lever attached to the front platform of the car and having its lower end arranged to engage and actuate said guide-plate, all as will be more fully hereinafter set forth and claimed.

The object we have in view is to provide street-cars with a convenient and practical device whereby the car-driver may easily and quickly set or throw the switches in any desired direction, the operation being effected from the front car-platform.

Hitherto, so far as we are aware, the usual manner of operating the switches of the class referred to is to force the switch-tongue back and forth, as occasion demands, by hand or by the use of a "switch-bar," as it is termed, held in the hands of an attendant whose duty it is to set the switch in advance of the approaching car. Sometimes pendulum-switches are employed—that is, the switch-tongue is attached to a movable platform let into the street adjacent to the switch, the lateral movement in such case being effected by the car-horses, which are properly guided by the car-driver onto the platform, the travel of the animals across it serving to swing or vibrate it, thereby imparting a corresponding movement to the switch-tongue.

In the accompanying two sheets of drawings, Figure 1, Sheet 1, represents a portion of the front end elevation of an ordinary street-car as equipped with our improved switch-operating mechanism, a portion of the apron being broken away to show more clearly the arrangement of the vertical lever and the manner of operating it to set or throw a switch, the latter, together with the track-rails, &c., being sectionally represented. Fig. 2 is a plan view in reduced scale, showing the guide-plate, &c., as arranged for a single switch, and also the manner by which the same is connected with the switch-tongue, the latter being set for the straight run. Fig. 3 is a similar view showing the switch set or thrown to divert a car onto the curved track. Fig. 4 shows an enlarged sectional view of the lower end of the operating-lever in the position when entering the guide-plate and throwing the switch, taken on line *x x*, Fig. 2. Fig. 5 shows the same when just leaving the guide-plate after having thrown the switch. Fig. 6, Sheet 2, is a plan view showing the manner of applying and connecting the guide-plate when used in a double switch. Fig. 7 is a front elevation of the vertical operating-lever in its normal position. Fig. 8 is a corresponding side elevation of the same. Fig. 9 is a partial horizontal sectional view taken on line *x x* of Fig. 1, showing the lever and quadrant. Fig. 10 is a plan view, in reduced scale, of the device shown in Fig. 6, showing it set to divert the car to the right. Fig. 11 shows the switch set to guide the car to the left, and Fig. 12 represents a partial side elevation of an ordinary street car as equipped with our improved device for operating switches.

A detailed description of our invention and the manner of operating it is as follows:

A in the drawings indicates an ordinary street-car having any suitable motive power, as horses, steam, electricity, &c. An operating-lever *a* is loosely attached to the inside of the front board *m* of the car-platform by a stationary pin *p* and a notched guide or quadrant *b*. The lever is slotted at *p'* to receive said pin and to permit vertical movement. At the upper end of the lever is a ball or other suitable handle *a'*, whereby the lever may be readily grasped with the hand. The other end a^2 is forked and carries a guide-wheel *w*. The lateral movement of the lever is limited by the ends of the guide-quadrant

b. The latter is also provided with a central notch *n'*, adapted to receive a tongue *n*, formed on the back of the lever *a*. The lever when not in actual use or in its normal position stands vertical. A rubber block serves to deaden the sound and prevent rattling of the parts.

The movable switch-operating guide-plate *c* is let into the base-plate or frame *e*, the upper surfaces of the two plates being substantially flush with each other and with the street-surface. The movable plate *c* is pivoted at d^3 to the frame, thereby permitting the former to move in a lateral direction or transversely to the track-rails *r*. It will be seen that as drawn the recess in the frame *e* is substantially the same in form and size as the guide-plate plus the amount or space *c'* required for the angular movement of the latter.

The frame *e* is provided on its under side with a box or chamber *e'*, in which the link or connection *g* is located. This link is jointed at *i* (just forward of the pivot-pin d^3) to the guide-plate and also to the usual switch-tongue *f*, as clearly shown in Figs. 1 and 2, slots being formed in the stationary plate to allow the joint-pins to work. It is evident now that upon moving the guide-plate at any time the tongue *f* will move in unison with it, both turning on their respective centers or pins. The guide-plate is provided on top with two raised converging guide-ribs *d*, the same extending rearwardly from the outer or free end of the plate any desired distance. We prefer to make the inner adjacent faces of these ribs beveled or undercut at the outer end, which are gradually transformed into vertical sides. (See Figs. 4 and 5 and the corresponding dotted lines, Fig. 2.)

The general construction and arrangement of the track-rails *r*, guide-rails *r'*, and switch-tongues *f* are substantially as common to roads having switches operated by hand in the usual manner. Our improvement resides mainly in the employment of the guide-plate *c*, combined with means for operating the same from a moving car—that is to say, assuming a car to be equipped with the operating-lever *a* and run upon the tracks *r*. Now, upon arriving at the switch, if the driver desires to continue the straight run he first depresses the lever by means of the treadle attachment *t*, at the same time grasping the handle *a'*, and, as drawn, forcing it to the left, Fig. 1. The forward movement of the car causes the guide-wheel *w* of the depressed lever to enter the mouth of the V-shaped space formed by the lateral separation of the ribs *d* and engage the right rib, thereby forcing the plate to the right against the corresponding side of the recess formed in the stationary plate *e*, thus placing the switch-tongue in position, as clearly shown in Fig. 2. The continued movement of the car causes the wheel to run along the rib until it passes out at the rear opening d^2, at the same time causing the lever to move back toward its normal position, the driver meanwhile retaining his grasp upon the handle, after which the pressure is removed from the lever and the spring raises it to its original position. The relation of the several parts is such that in practice the car-wheels will pass upon the switch-tongue immediately after the setting of it. In the single switch the opening d^2 between the ends of the ribs *d* is somewhat wider than the wheels *w*.

In case the driver desires to run the car from the straight track to the right (see Fig. 3) it is accomplished by repeating the operation just described, except that the lever is first moved toward the right and is next depressed. It is obvious that the driver must exert force enough upon the lever *a* to move the plate *c* and switch-tongue through the medium of the wheel *w* and the rib *d* against which it bears. The bed-plate *e* is provided with a forward extension e^2 for the purpose of forming a guide or track for the wheel *w* as it advances onto the plate *c*.

Our device is equally well adapted to operate a three-way switch. (See Figs. 6, 10, and 11.) In this case, however, we provide the movable plate *c* with two sets of guide-ribs, the central pair of ribs being arranged substantially as before described, except that the terminal space d^2 is narrower, being arranged to allow the wheel *w* to pass easily through it. The other or outer guide-ribs are arranged substantially parallel with the inner ribs, the corresponding space or track portion *d'* being considerably wider than the wheel and nearly uniform throughout its length, as clearly represented in Fig. 6. It will be seen that the connection *g* is jointed to both switch-tongues and to the guide-plate *c*, thereby insuring that these parts shall, when actuated, always move together.

In order to adjust the switch last described so that the car will maintain a straight course past the switch, the driver simply places the lever *a* in a vertical position and depresses it until it is arrested by the track-plate extension e^3, the tongue *n* of the lever thereby passing into the notch *n'*, which acts to hold the lever laterally, thus relieving the driver from exerting much force upon the handle. In this position of the lever, even though the plate be standing at either extreme, the advancing wheel upon coming in contact with one or the other of the inner ribs *d* will move the plate, and as the wheel enters the narrow portion of the run or space d^2 the plate will be brought back to the proper central position, thus setting both switch-tongues at once. (See corresponding position, Fig. 6.) The space d^2 is straight for some distance, its width being equal to the thickness of the guide-wheel, thereby insuring the proper setting of the switch centrally. When in this position it will be seen that a space or clearance *c'* is formed at each side of the plate *c*. In setting the switch to the right or left the driver simply moves and depresses the lever

a from its normal position, thereby placing the wheel in position to enter the corresponding outer space d'. The wheel next engages with the outer rib and forces the guide-plate to its limit, the further movement being substantially as before stated in describing the manner of operating the single switch. We would further add that, as before stated, the quadrant or guide b, secured to the front board, is so arranged that it forms a stop in limiting the angular movement of the lever a, the relation of the parts being such that the wheel w will always enter the space formed by the ribs d before it engages with either of them. The operating-lever can be depressed and moved at will in the two spaces formed in the quadrant by the center groove n' and adjacent ribs, but not in both at the same time. The said groove and short tongue n are more particularly adapted to be employed in the double switch illustrated in Fig. 6.

It is evident that the construction and arrangement of the parts may be changed somewhat without departing from the spirit of our invention, which consists, essentially, of a switch-operating plate and a lever for actuating it controlled and operated from the car.

We claim as our invention and desire to secure by United States Letters Patent—

1. In a tramway-switch-operating mechanism, a lever loosely attached to a fixed part of a car and free to play vertically within fixed limits and carrying a yielding block near its upper end, a guide-wheel carried by the lower end of the lever, and a spring-actuated-treadle attachment on said lever, as set forth.

2. In a tramway-switch-operating mechanism, a vibrating lever loosely mounted on a car and free to play vertically within fixed limits, a guide-wheel carried by the lower end of the lever, a spring-actuated-treadle attachment on the lever, and a guide-quadrant having stops at the ends, and a rubber block on the lever and engaging the under side of the said quadrant, as and for the purpose specified.

In testimony whereof we have affixed our signatures in presence of two witnesses.

WILLIAM E. MEAGHER.
ALBERT HOWARTH.

Witnesses:
GEO. H. REMINGTON,
CHARLES W. BOARDMAN.