

A. C. WOLFE.  
LOCOMOTOR SWITCH THROWING DEVICE.

(Application filed Aug. 26, 1901.)

(No Model.)

3 Sheets—Sheet 1.

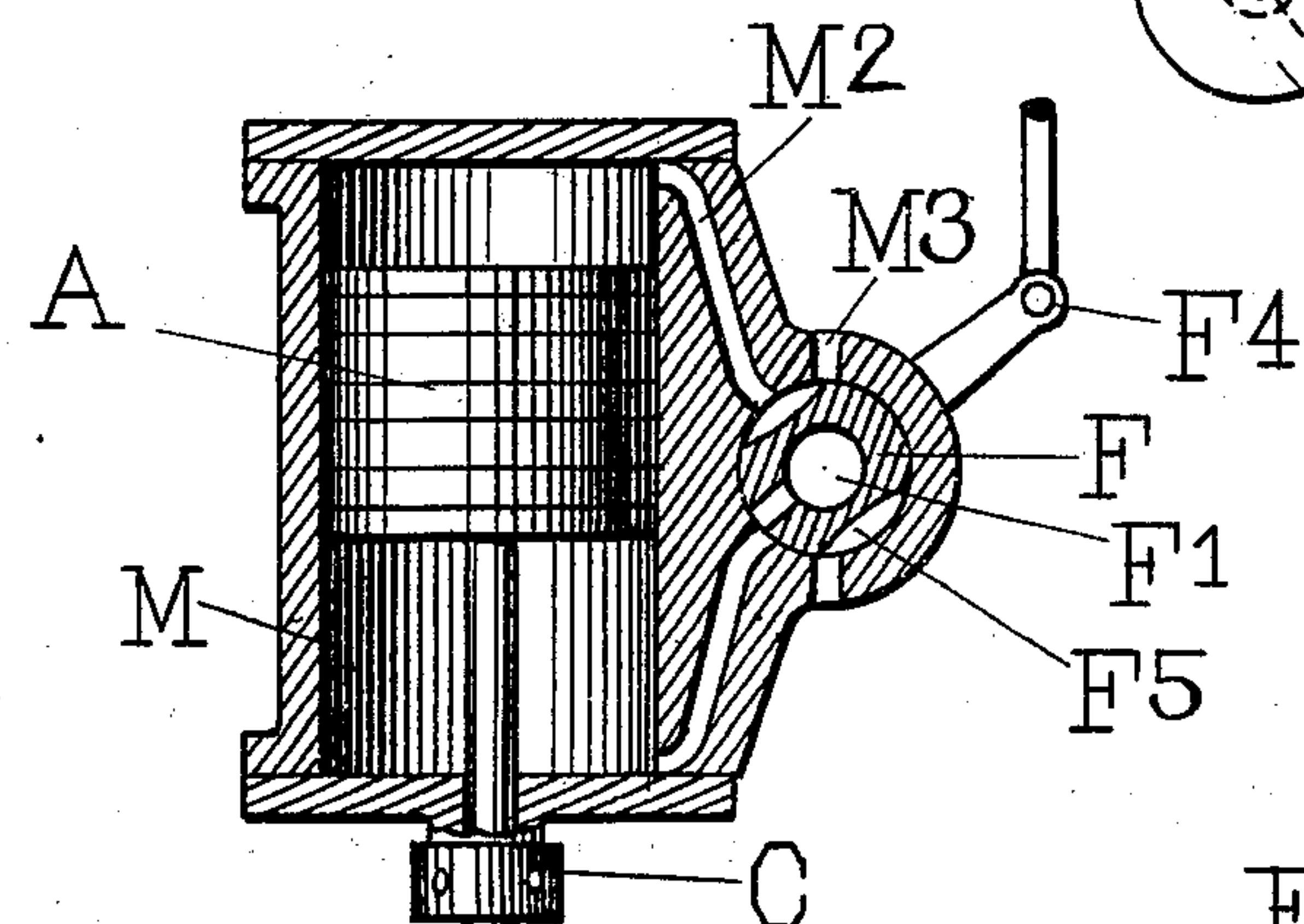
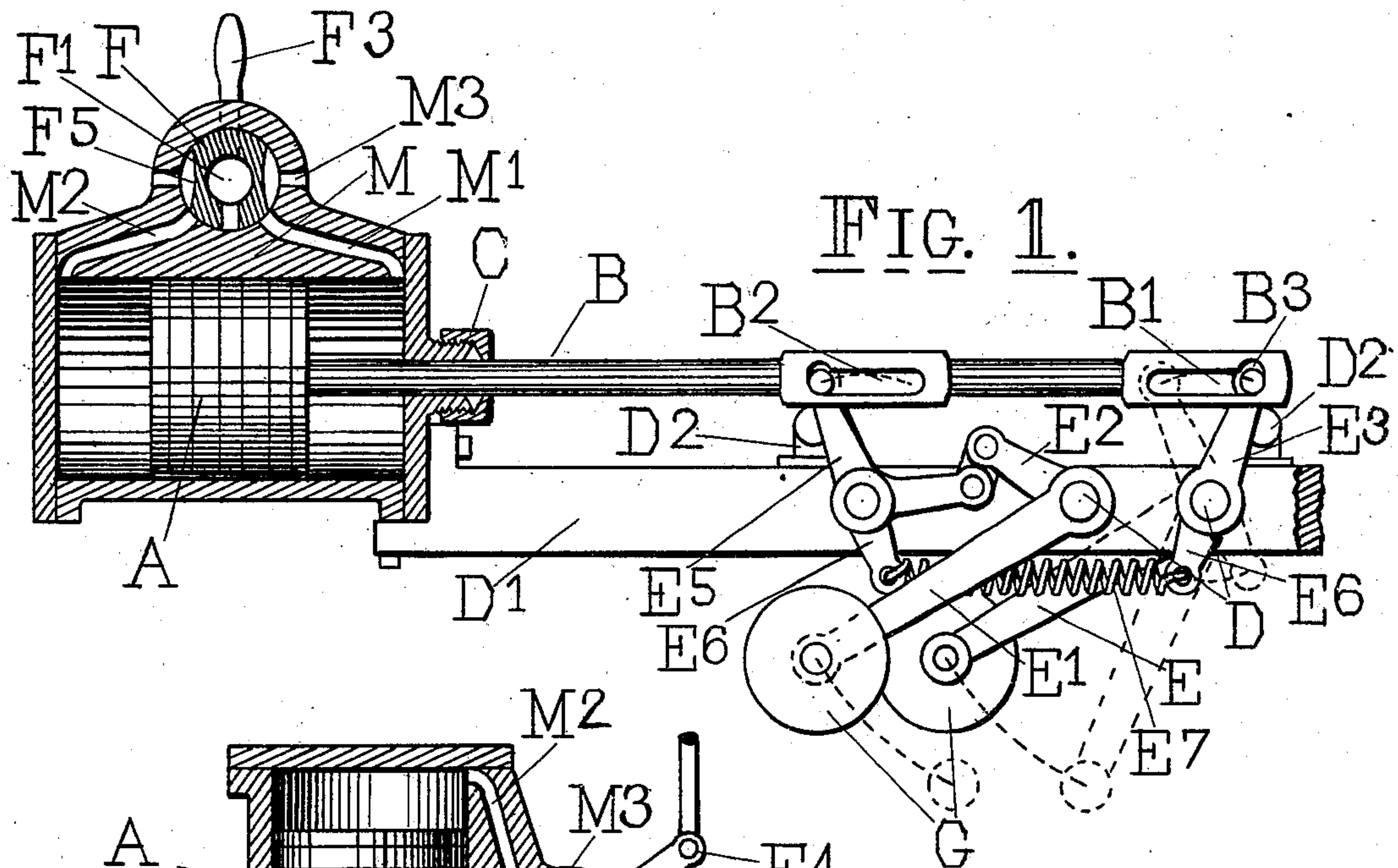


FIG. 2.

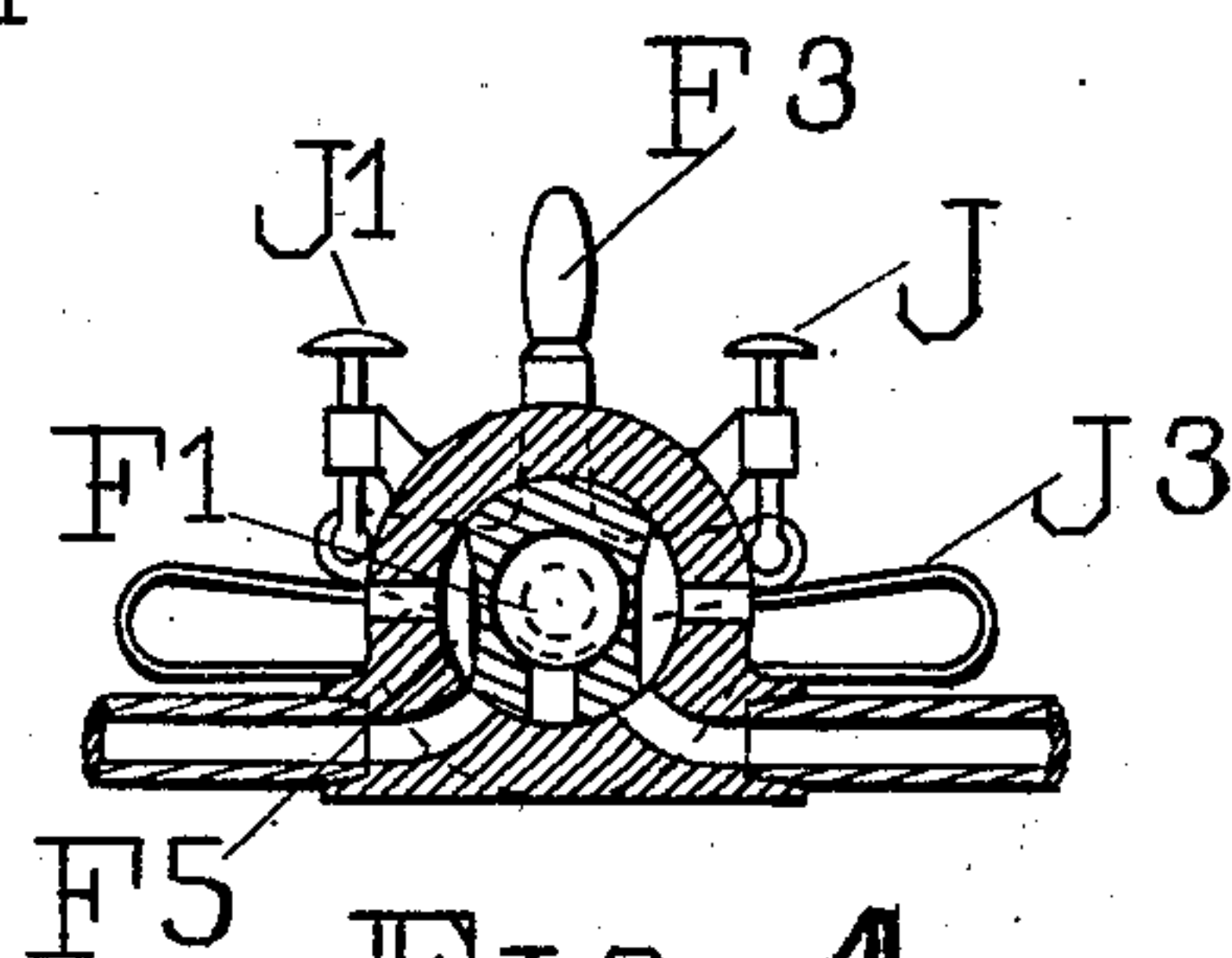


FIG. 4.

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No. 702,042.

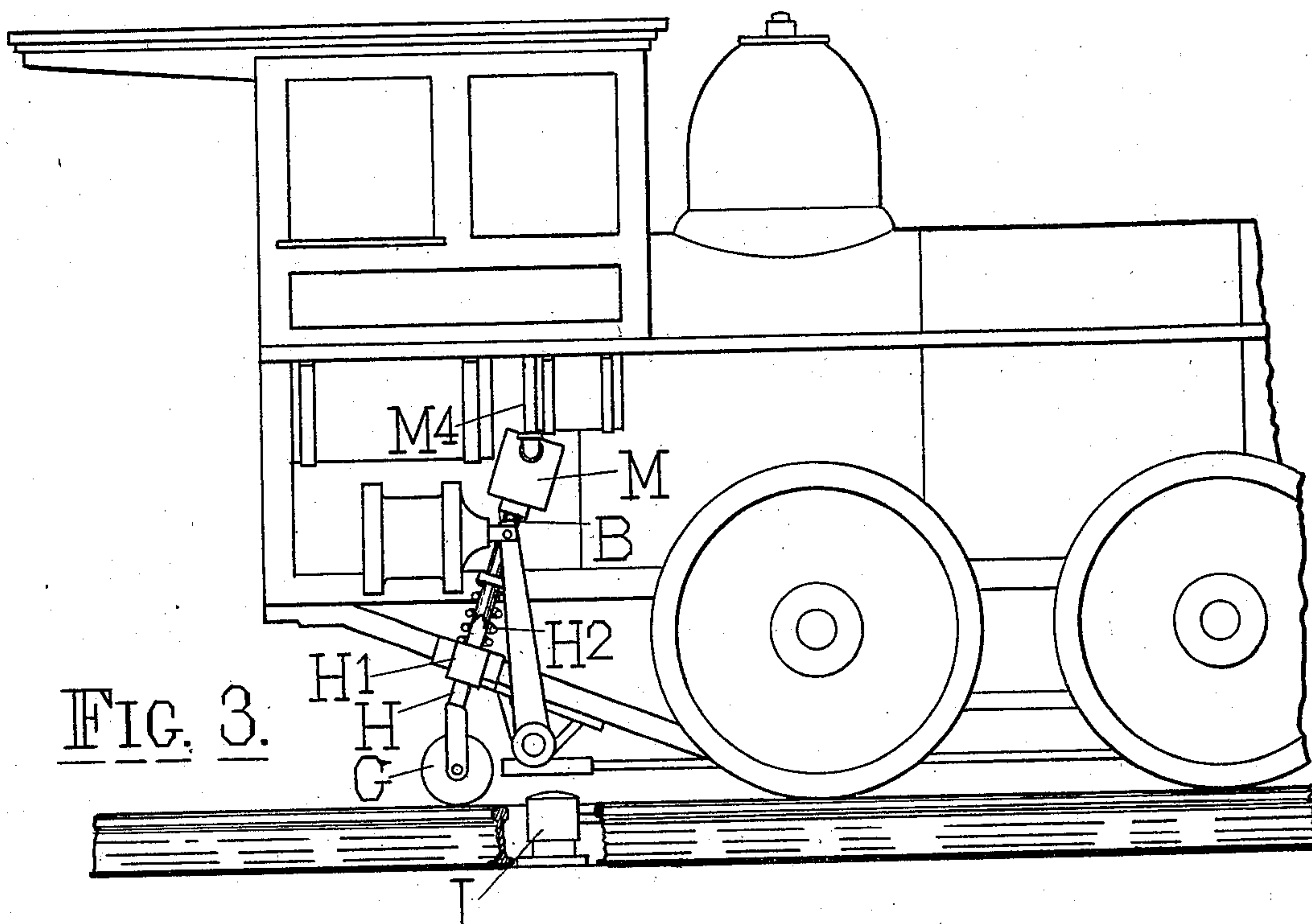
Patented June 10, 1902.

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3 Sheets—Sheet 2.

(No Model.)



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3 Sheets—Sheet 3.

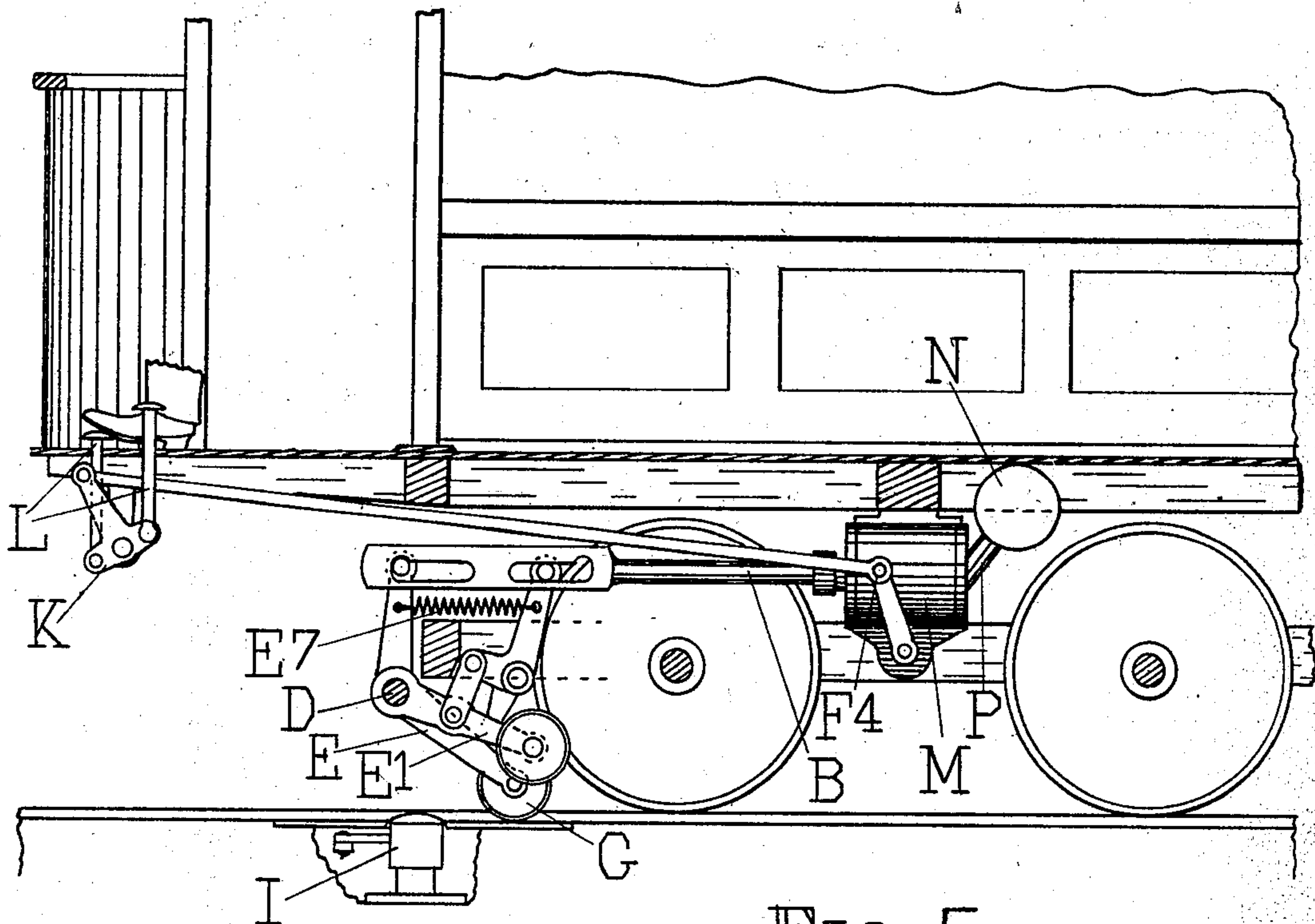


FIG. 5.

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# UNITED STATES PATENT OFFICE.

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TO JOSEPH F. HEWITT, OF ALLEGHENY, PENNSYLVANIA.

## LOCOMOTOR SWITCH-THROWING DEVICE.

SPECIFICATION forming part of Letters Patent No. 702,042, dated June 10, 1902.

Application filed August 26, 1901. Serial No. 73,394. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW C. WOLFE, a citizen of the United States, residing at No. 1415 Sixteenth avenue, in the city of Denver, county of Arapahoe, and State of Colorado, have invented a new Locomotor Switch-Throwing Device, of which the following is a specification.

This invention relates to switch-throwers of that class in which the switch being approached by a car, locomotive, motor-car, or any wheeled structure adapted to be run upon a track having switches may be thrown by operating suitable mechanism upon the car or other structure, which for the sake of convenience will here be termed a "locomotor." This switch-throwing device is intended to be operated by means of compressed air as a motive agent or other power means under pressure and adapted to operate a piston in a cylinder, and hence the word "air" will be herein used in a comprehensive sense to embrace all such power means.

The objects of this invention are, first, to provide a switch-throwing device which shall be easily and surely operable without stopping or slowing down the locomotor; second, to provide a switch-thrower which shall be capable of being operated without the motorneer being required to move materially out of his usual position; third, to provide a switch-thrower which shall be powerful and adapted to overcome dirt and other minor obstructions in the switch and yet not require much exertion on the part of the motorneer; fourth, to provide a locomotor switch-thrower in which two distinct selectors shall be operable from one and the same piston, and, fifth, to provide a switch-thrower in which one retracting means or spring shall replace both selectors after their use and shall also replace the piston operating them in its central or normal position.

The above objects are attained by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the horizontal form of switch-thrower detached, the operating-piston being shown in section. Fig. 2 is a similar side elevation of a vertical form of the switch-thrower detached. Fig. 3 is a side

elevation of a portion of a locomotive with the switch-thrower attached. Fig. 4 is an elevation, partly in section, of a detached controlling-valve. Fig. 5 is a sectional elevation of a portion of a motor-car, showing the horizontal form of switch-thrower attached. Figs. 1, 2, and 5 represent the operating cylinder and piston as being of the double-acting type. Fig. 3 represents the operating piston as being of the single-acting type, in which two similar switch-throwers will be located upon opposite sides of the locomotive, and a controlling-valve, as shown in Fig. 4, is located in the cab convenient to the engineer and is piped to the air-brake system as a source of supply and to the two opposite cylinders of the switch-thrower.

Like characters designate similar parts in the several views.

The motor-cylinder or cylinder by means of which the switch-thrower is operated is designated M, and a piston A of the usual form is fitted therein, the piston-rod B being guided in the stuffing-box C. In the double-acting form shown in Figs. 1, 2, and 5 the normal position of the piston A is in the center of the cylinder M, which is provided with a two-way valve F, supplied with air under pressure from any desirable source, as from the air-brake system of a locomotive or from a suitable reservoir upon a car equipped with the switch-thrower, the air being preferably conducted to the central opening F' of the valve, from which it is admitted to the port M' to extend the piston-rod or to the port M<sup>2</sup> to draw in the piston-rod by rocking the valve in the appropriate direction by any suitable means, as by the handle F<sup>3</sup> or by the lever and rod F<sup>4</sup>. The valve F is provided with suitable cut-away places or openings F<sup>5</sup>, which permit of the exhausting of the air from both ends of the cylinder when the valve is in its normal position, as in Fig. 1, through the openings M<sup>3</sup> at the sides of the valve-chest.

Fixed in a suitable support, as D', are pivots or studs D, upon which are freely mounted two similar levers or bars E E', and rigidly connected to these levers are the crank-arms E<sup>2</sup> and E<sup>3</sup>, and pivotally mounted on the support D' is also an angle-lever E<sup>5</sup>, which is connected with the arm E<sup>2</sup>, so as to give re-



verse movements to the top ends of arm  $E^3$  and lever  $E^5$  for similar movements of levers  $E$  and  $E'$ . Secured to the support  $D$  are suitable stops  $D^2$ , which engage the arms  $E^3$  and  $E^5$  to limit the upward swinging movement of levers  $E$  and  $E'$ . The lower or free ends of the levers are provided with switch-throwing wheels  $G$ , which are revolubly mounted on suitable studs secured in the levers. The arm  $E^3$  and lever  $E^5$  are provided with opposite arms  $E^6$ , which are connected by a suitable spring  $E^7$ , tending to retain the wheels  $G$  in their upper position, as shown by full lines in Fig. 1, with the arms against the limit-stops  $D^2$ .

The piston-rod  $B$  is provided with two similar reversed slots  $B'$  and  $B^2$ , which engage with the pins of the cranks  $E^3$  and  $E^5$ , the said pins normally being in engagement with the opposite ends of the said slots, as shown. This form of construction causes the depression of the lever  $E$ , with its wheel  $G$ , when the piston-rod  $B$  is drawn in, the arm  $E^5$  and slot  $B^2$  cooperating as a support and guide for the piston-rod  $B$ . In a similar manner the arm  $E'$ , with its wheel  $G$ , will be depressed when the piston-rod is extended from its normal position, and the arm  $E^3$  and slot  $B'$  will cooperate in a similar manner to sustain and guide the piston-rod  $B$ . The opposite ends of slots  $B'$  and  $B^2$  are provided with slight transverse enlargements  $B^3$ , which permit the curved movement of the arms engaging with the slots.

In the vertical form shown in Fig. 2 the reverse-lever  $E^5$  is omitted, the reverse movements of the levers  $E$  and  $E'$  being secured by means of the opposite direction of the arms  $E^3$  and  $E^4$ , as shown. In this view the valve  $F$  is represented as having been tipped to admit air under pressure to the piston-rod end of the cylinder and the piston as having been advanced part way through its upward stroke, thus lowering the lever  $E$ , with its wheel  $G$ , to an operative position to engage the portion of the switch-operating device located between the tracks, as shown in outline in Fig. 3. The full operation and construction of this switch are shown in my former patent, No. 678,084, dated July 9, 1901, entitled "Railway switch mechanism," to which attention is respectfully called.

In the form of switch-thrower shown in Fig. 3, which is one form especially adapted to a locomotive, the substitute for the lever  $E$  is the sliding bar  $H$ , which may be rigidly fixed to or coincident with the piston-rod  $B$ . This bar  $H$  is preferably formed square near its lower extremity and slides freely but non-revolubly in the cap  $H'$ , secured to the frame of the locomotive. The location is such as to place the wheel  $G$  somewhat inside of the track, which is represented as broken away to show an outline of the portions of the switch-operating device  $I$ , which is depressed by the wheel  $G$  to throw the switch ahead or behind the locomotive. For use upon a

locomotive the cylinders  $M$  are preferably made single-acting, as previously stated, and are connected by pipes  $M^4$  with a suitable controlling-valve, as the one represented in Fig. 4, located in a convenient place in the cab or at the front and rear ends of the locomotive and tender. For use on switch-locomotives one of these controlling-valves will be located at the pilot and another at the rear end of the tender, that the switch being approached may be thrown by the switchman on the usual footboard and without getting off or stopping the locomotive. It is obvious that either of the forms of switch-thrower shown in Figs. 1 and 2 may be placed upon a locomotive and that the form shown in Fig. 3 may be placed upon an ordinary street-car. In case of placing the single-acting cylinder type on a car the controlling-valve may be located convenient to the foot of the motorneer, and the pushes  $J$  and  $J'$  may be stepped on to operate the switch being approached, the opposite springs  $J^3$  being for the purpose of returning the valve  $F$  to its normal position, as shown. When this valve, as seen in Fig. 4, is placed in a locomotive-cab, it is preferably manipulated by means of the handle  $F^3$ . In Fig. 3 the spring  $H^2$  retracts or raises up the bar  $H$  and wheel  $G$  after the same have been depressed by the admission of air to the cylinder  $M$ , the shoulder shown on the bar acting as a stop against the cap  $H'$ .

It is evident that the levers  $E$  and  $E'$  and the bar  $H$  may terminate in a curved lower end or shoe, which will be operative to depress the switch mechanism  $I$  as a substitute for the wheel  $G$ ; but the wheel is the preferred form obviously.

In Fig. 5 the levers  $E$  and  $E'$  are represented as both pivoted upon the same shaft  $D$ , supported from the truck-frame in any desirable manner, and the spring  $E^7$  is here operative as a push-spring instead of a tension-spring, as in Figs. 1 and 2. The valve lever and rod  $F^4$  are here shown as operated by a double bell-crank  $K$ , which has two opposite-acting pushes  $L$ , one of which is shown depressed by the foot of the motorneer, in consequence of which the piston-rod  $B$  has been partly drawn in and the lever  $E$  has been depressed to the working position and is shown with the wheel  $G$  resting on the surface of the pavement between the tracks and approaching the switch-operating device outlined in the broken-away place in the pavement.

In Fig. 5,  $N$  represents a tank containing a supply of compressed air with which to operate the switch-thrower and is piped to the cylinder by pipe  $P$ .

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a locomotor switch-thrower, the combination with a double-acting cylinder and piston, of a right-track and a left-track se-



lector connected with said piston; a double-acting controlling-valve for the admission of the motive agent to said cylinder; and opposing springs for returning said valve to its neutral inoperative position.

2. In a locomotor switch-thrower, the combination with a double-acting cylinder and piston, of a right-track and a left-track selector operatively connected with said piston; a double-acting controlling-valve for the admission of air to and exhaust from both ends of said cylinder, the exhaust from both of said ends being normally open and the admission thereto being normally closed; and opposing springs for yieldingly sustaining said valve in its normal position.

3. In a locomotor switch-thrower, the combination with a double-acting cylinder and piston, of a right-track and a left-track selector operatively connected with said piston; an oppositely-moving controlling-valve for governing the actuating of said piston in opposite directions; yielding means for sustaining said valve in its non-admission position; and opposite selective pushes operatively connected with said valve, to cause either selector to be moved to the operative position.

4. In a locomotor switch-thrower, the combination with a car or carriage adapted to traverse a track, of a double-acting cylinder and piston; a right-track and a left-track selector operatively connected with said piston; an oppositely-moving controlling-valve for the motive agent for said cylinder; opposing springs tending to sustain said valve in its non-admission position; and opposite selective means at one or both ends of said car, operatively connected with said valve.

5. In a locomotor switch-thrower, the combination, with a cylinder and actuating-piston, of a right-track and a left-track selector connected with said piston; and means for operating said piston.

6. In a locomotor switch-thrower, the combination, with a cylinder and actuating-piston, of a right-track and a left-track selector connected with said piston, and adapted to be operated respectively by the reverse movements of said piston; and power means and a controlling-valve for moving said piston in either direction.

7. In a locomotor switch-thrower, the combination, with a cylinder and actuating-piston, of a right-track and a left-track selector connected to be operated respectively by the reverse movements of said piston; power means and a controlling-valve for moving said piston in either direction; and retracting means for returning said piston to its neutral position.

8. In a locomotor switch-thrower, the combination, with a cylinder and actuating-piston, of a right-track and a left-track selector; slotted means moving with said piston, and engaging said selectors; and retracting means and stops for said selectors.

9. In a locomotor switch-thrower, the com-

bination, with a cylinder and actuating-piston, of a right-track and a left-track selector; a reversing-lever connected with one of said selectors; and slots movable with said piston, and engaging said reversing-lever and the other of said selectors.

10. In a locomotor switch-thrower, the combination, with a cylinder and actuating-piston, of two reverse-connected switch-throwing selectors operated by said piston; a retracting-spring and stop for each of said selectors; and power means and a controlling-valve for moving said piston in either direction, and releasing the same.

11. In a locomotive switch-thrower, the combination with right-track and left-track selectors, of actuating means for moving either of said selectors into operative position; a single oscillatable two-way controlling-valve for the admission of air from the air-brake system to said actuating means; exhaust connections from said actuating means, normally maintained open by said valve; and opposing yielding means tending to maintain said valve in its normal position.

12. In a locomotor switch-thrower, the combination with a locomotive having right-track and left-track selectors, of a piston and opposite conduits adapted to move either selector into operative position upon the admission of a motive agent to the appropriate conduit; an oscillatable valve located convenient to the engineer or switchman, or both, and normally closing both of said conduits when in its neutral position; exhaust connections to said valve, in position and adapted to have either one covered thereby upon tipping the valve to open the mating admission-conduit; yielding means tending to move said valve to its neutral position; and means for operating said valve in opposite directions at will.

13. In a locomotor switch-thrower, the combination with a car adapted to traverse a track, of an air-operated switch-thrower having right-track and left-track selectors; a reservoir containing air under pressure; admission connections from said reservoir to said switch-thrower; exhaust connections from said switch-thrower; and a controlling-valve normally closing said air connections and maintaining open the said exhaust connections.

14. In a device of the class specified, the combination with an automatic brake-controlled air-compressing means, of a tank connected with the delivery of said air-compressing means; air-operated right-track and left-track selectors; oppositely-operative pairs of admission and exhaust passages from said tank to and from said selector-operating device; and a controlling-valve governing said passages.

15. In a device of the class specified, the combination, with a car adapted to traverse a track, of an air-receiver containing air above atmospheric pressure; an air-piston adapted to operate a left-track switch-thrower when



5 moved in one direction, and to operate a right-track switch-thrower when moved in the reverse direction; and a controlling-valve for the admission of air from the receiver to either side of said piston.

10 16. In a device of the class specified, the combination with a car adapted to traverse a track, of an air-receiver containing air above atmospheric pressure; an air-piston adapted to operate a left-track switch-thrower when moved in one direction, and to operate a right-track switch-thrower when moved in the opposite direction; a controlling-valve governing the admission of air from said receiver to 15 either side of said piston, and the exhaust from said piston; and opposite selecting foot-pushes operatively connected with said valve.

17. In a device of the class specified, the

combination with a car adapted to traverse a track, of an air-tank, controlling-valve and 20 double-acting air-piston; right-track and left-track selectors connected for operation by means of opposite movements of said piston respectively; and vertically-disposed wheels in said selectors, in position and adapted to 25 depress switch-throwing means operatively connected with said track.

In testimony whereof I have hereunto set my hand and affixed my seal, before two subscribing witnesses, at Denver, Colorado, this 30 21st day of August, A. D. 1901.

ANDREW C. WOLFE. [L. S.]

Witnesses:

HARRY PALMER,  
OLGA JACOBSON.