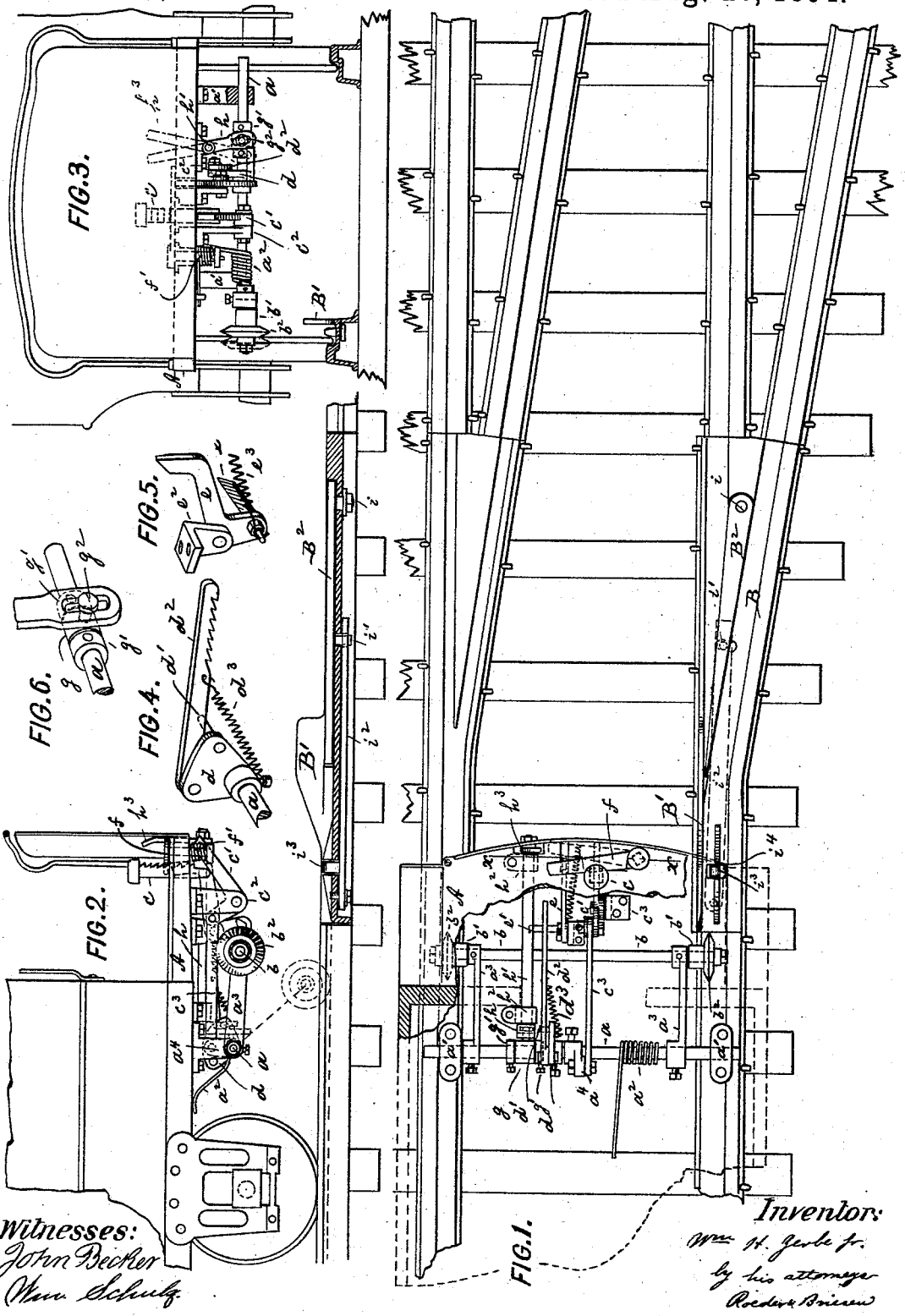
(No Model.) 2 Sheets—Sheet 1.

W. H. ZERBE, Jr.

SWITCH OPERATING MECHANISM.

No. 525,041. Patented Aug. 28, 1894.



Witnesses:
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(No Model.) 2 Sheets—Sheet 2.

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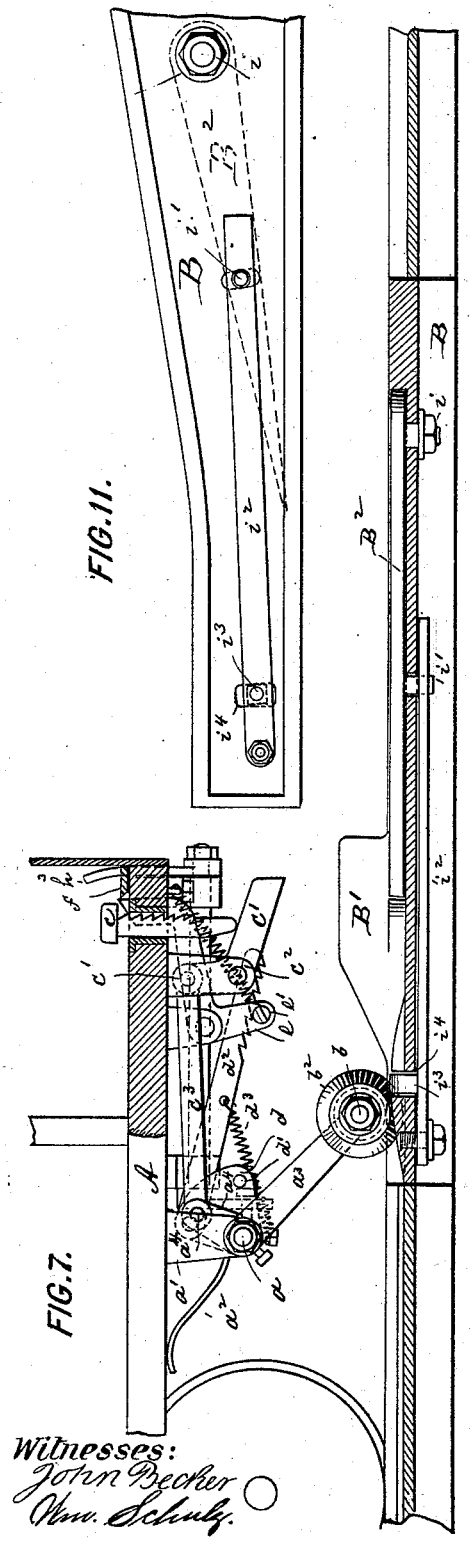

FIG. 11.

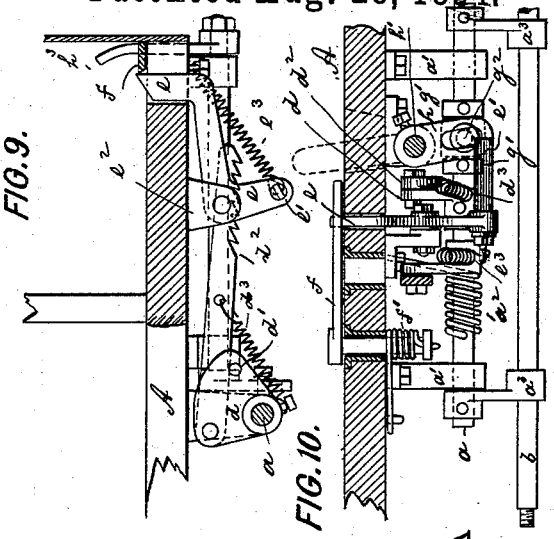

FIG. 9.

FIG. 10.

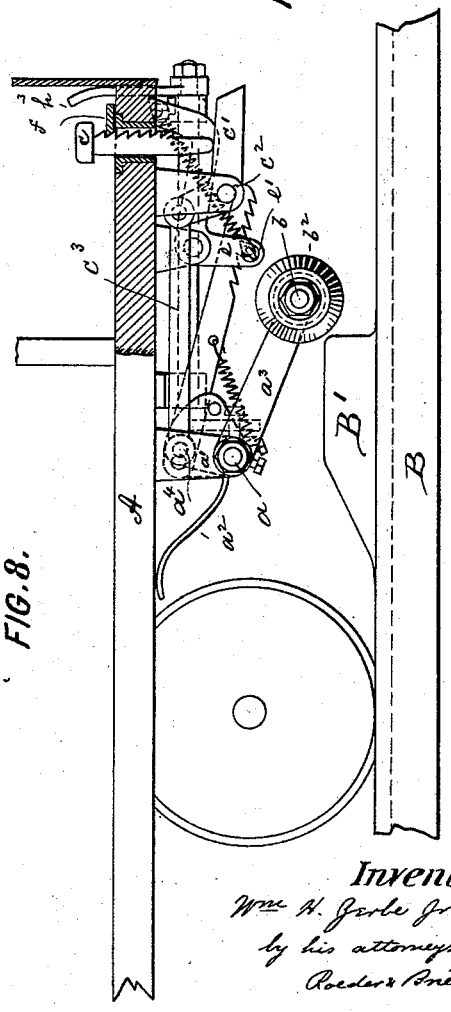

FIG. 8.

FIG. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM H. ZERBE, JR., OF BROOKLYN, NEW YORK.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 525,041, dated August 28, 1894.

Application filed October 3, 1893. Serial No. 487,082. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ZERBE, Jr., of Brooklyn, Kings county, New York, have invented an Improved Switch-Operating Mechanism, of which the following is a specification.

This invention relates to an improved mechanism by which the motor man or driver of a street car is enabled to readily set his own switches, without getting off the car.

In the accompanying drawings: Figure 1 is a plan, partly in section of the switch operating mechanism. Fig. 2 is a side elevation partly in section thereof, with the roller b^2, raised; Fig. 3 a front elevation thereof with part of axle b, and one of rollers b^2, removed. Fig. 4 is a perspective view of rack d^2; Fig. 5 a similar view of stop e; Fig. 6 a similar view of the shifting mechanism; Fig. 7 a sectional elevation of the switch operating mechanism, with roller b^2, lowered; Fig. 8 a similar view with the roller partly raised; Fig. 9 a side view of the mechanism for operating stop e. Fig. 10 is a cross section on line x, x, Fig. 1, with pawl f, released, and Fig. 11 a bottom view of the frog.

Briefly stated my invention consists in providing the car with a shaft adapted to be lowered and carrying a roller and a collar. The roller will first bear laterally against a slide to set the switch and then the collar will engage a shoulder projecting upwardly from the rail, to automatically raise the shaft, after the switch has been set.

The letter A represents the platform or bottom of a car, driven by animal power, steam, electricity, cable or any other suitable motor. From the platform there project downwardly two hangers a', in which is hung a sliding rock shaft a, influenced by a spring a^2. The rock shaft a, is provided with two arms or bearings a^3, in the perforated forward ends of which there is hung an axle b. This axle carries preferably at each end, a collar b', and a switch operating roller b^2, the latter being beveled at both faces as shown. Through a perforation of the car platform A, there extends downwardly a push rod c, operated by the foot and provided with teeth to constitute a rack. The lower end of this rod engages and operates an elbow lever c', pivoted to a hanger c^2 and connected by a draw rod c^3, with an arm a^4, of rock shaft a.

As thus far described, the mechanism operates as follows: The motor man, upon depressing the bar c, will rock the shaft a, which in turn will lower the axle b, and with it the roller b^2. This roller will engage a slide on the track and set the switch. When pressure upon the bar c, is released, the shaft a, is rocked back by spring a^2, and the axle b, and rollers b^2, are raised to clear the track. Additional mechanism must however be provided to automatically raise the roller independent of any action by the motor man, as soon as the switch has been set. Otherwise, if the motor man should fail to raise his foot in proper time, the roller would collide with the rails and it as well as the rails would be injured or the car would be derailed. This automatic mechanism is as follows: To the switch rails B and in back of the slide operated by the roller b^2, there is secured an upwardly extending projection B', having a beveled edge. This projection is adapted to come into contact with the collar b', and to gradually raise the axle b, after the roller b^2, has done its work of shifting the slide. The raising of the axle b, will, of course, rock shaft a, backward and this shaft, I have provided with mechanism that locks the rack c, in its raised position, until the motor man, at any suitable time releases the same, ready for the next switch. This locking mechanism consists of an arm d, keyed to rock shaft a, and provided with a fixed stop pin d', and a pivoted rack d^2, influenced by spring d^3. The rack d^2, is adapted to engage a pin e', secured to an elbow lever e, pivoted to hanger e^2, and influenced by spring e^3. The upper end of elbow lever e, constitutes a stop and projects upwardly through a perforation in the car bottom A. This stop projects normally in front of a pawl f, actuated by a spring f', and which when released, engages one of the teeth of the toothed foot bar c.

The entire mechanism as thus far described, operates as follows: The motor man, on approaching the switch depresses foot bar c, and thereby rocks shaft a, forward and lowers axle b, with collar b', and roller b^2. The shaft a, moreover by being rocked forward will

cause the rack d^2, to move forward and upward and to engage the pin e', of elbow lever e. The roller b^2, now performs its work of setting the switch and immediately thereafter the stop B', will push the axle b, by collar b', upward. In this way the shaft a, will be rocked backward and will by its elbow lever c', throw the foot bar e, upward (whether the foot is moved or not), and at the same time will by its rack d^2, draw the stop e, backward until the rack comes into contact with pin d', when it will be vibrated to release the stop. The downward motion of the upper arm of the stop will cause it to liberate spring pawl f, which will now fly forward to engage one of the teeth of the rack bar c, so as to lock the same in its raised position. In this way all the parts are securely locked and remain in this position, until the motor man, at his leisure and before meeting the next switch, pushes the spring pawl out of the teeth of rack c, when the stop e, now released from rack d^2, will be thrown upward by its spring, so as to again intervene between foot rack c, and pawl f. The parts are thus properly set for operating the next switch. The rock shaft a, is a sliding shaft, so that it, and by it the axle b, and roller b^2, may be moved to the right or left, according to the direction in which the switch is to be set. To effect the sliding movement, the shaft a, is surrounded by a rotatable collar g, confined between two fixed collars g'. The collar g is provided with a pin g^2, engaging a slotted link h, projecting downwardly from one end of a rock shaft h', supported by the hangers h^2. The shaft h', is provided at its forward end with an arm h^3, projecting upwardly through an opening of the car platform. As the motor man throws this arm to the right or left, he will rock the shaft h' and consequently the shaft a, in an opposite direction, *i. e.*, in a direction corresponding to that which the car is to pursue.

Of course the switch to be operated by the above described mechanism, may be constructed in different manners. I have shown a movable frog point B^2, pivoted at i, and connected by a pin i', with a lever i^2, received by a suitable chamber of the switch plate. The lever i^2, is near its end provided with the slide or button i^3, adapted to move laterally in a slot i^4, and protected by suitable approaches. The roller b^2, on being lowered will crowd against either the right or left side of the slide, in accordance with the position into which it has been placed by the motor man. When the slide is thus moved to the right or left, the frog point will be moved in a corresponding direction and thus the switch is set. I have shown the axle b, provided with a roller b^2, and collar b', at each end, so that the car can operate switches or frogs at either side of the track, but if desired but one roller and collar need be used.

What I claim is—

1. The combination of shaft a, with axle b having roller b^2, a foot bar c, a pawl engaging the same, a stop engaging the pawl, and mechanism for operating the stop, substantially as specified.

2. The combination of a shaft, with an axle connected thereto by arms a^3, and with a collar b' and roller b^2, mounted upon the axle, substantially as specified.

3. The combination of a laterally movable rock shaft with an axle connected thereto, a switch operating roller and collar mounted upon the axle, a foot bar c, and mechanism for locking the foot bar in its raised position, substantially as specified.

4. The combination of shaft a, with axle b, having roller b^2, a foot bar c, means for transmitting the motion of the foot bar to the shaft, a pawl adapted to engage the foot bar, and means for automatically releasing said pawl, substantially as specified.

5. The combination of shaft a, with axle b, having roller b^2, a foot bar c, a rack secured to the shaft, a stop engaged by the rack, and with a pawl that is engaged by the stop and is adapted to engage the foot bar, substantially as specified.

6. The combination of shaft a, with axle b roller b^2, an elbow lever and rack secured to the shaft, a foot bar operating the elbow lever, a stop operated by the rack and a pawl operated by the stop and adapted to engage the foot bar, substantially as specified.

7. The combination of a movable rail with a slide connected thereto, a projection B', and with a roller and a collar secured to the car and adapted to be lowered into contact with the slide and projection respectively, substantially as specified.

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