

(No Model.)

2 Sheets—Sheet 1.

J. G. GROSHEIM & G. L. SEAMAN.
SWITCHING APPARATUS FOR STREET CARS.

No. 598,705.

Patented Feb. 8, 1898.

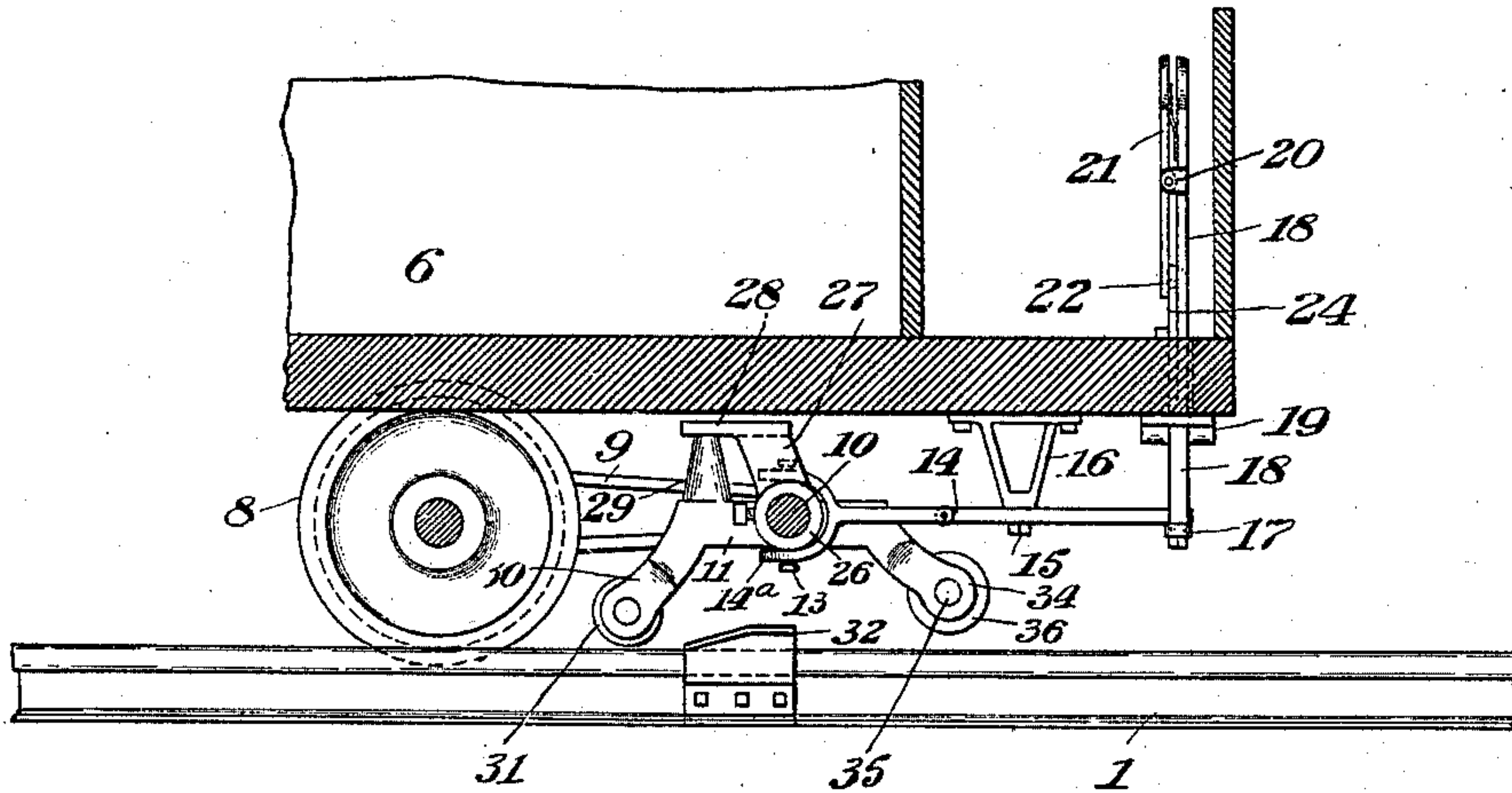


Fig. 1

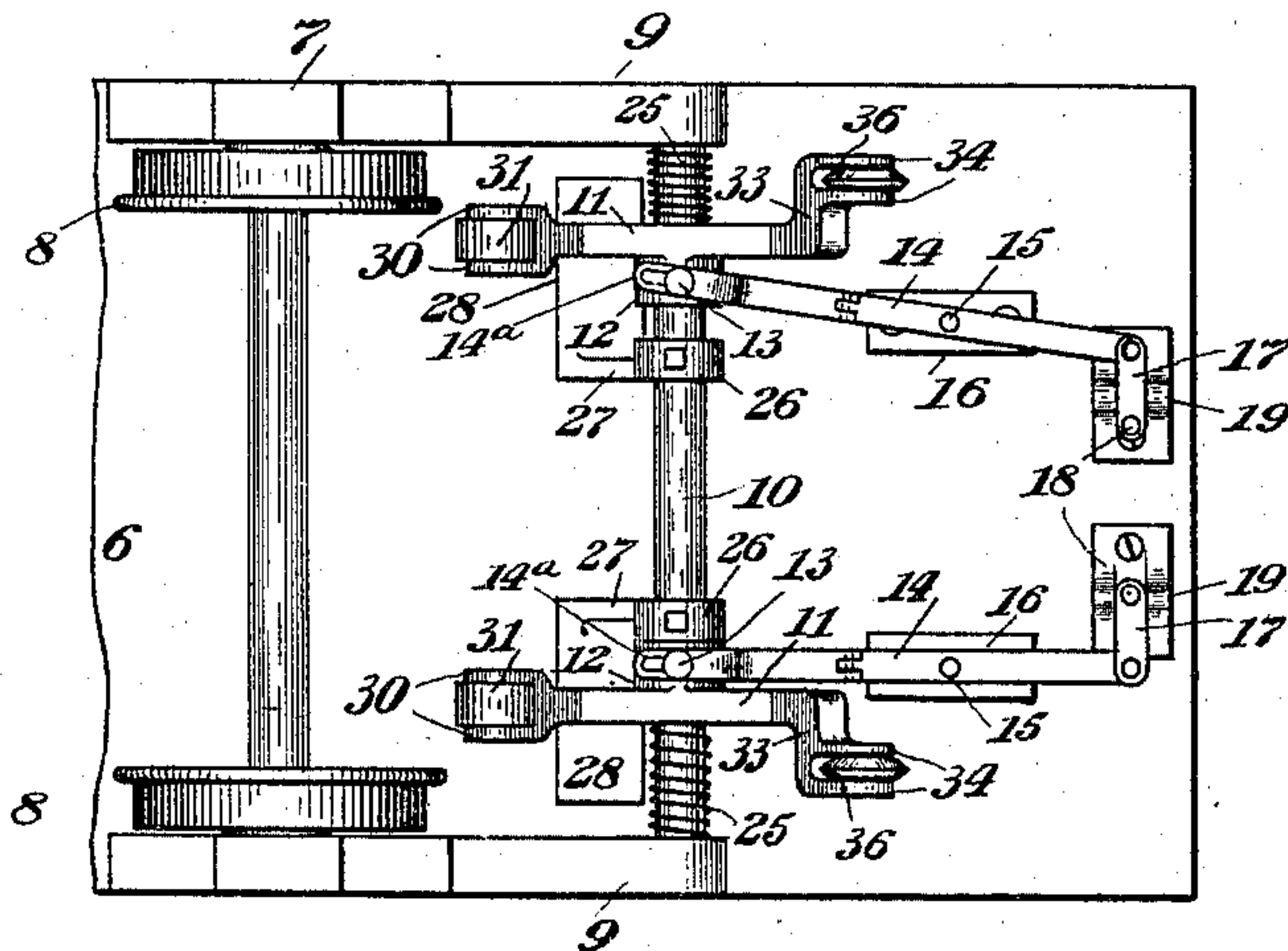


Fig. 2

WITNESSES

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2 Sheets—Sheet 2.

Patented Feb. 8, 1898.

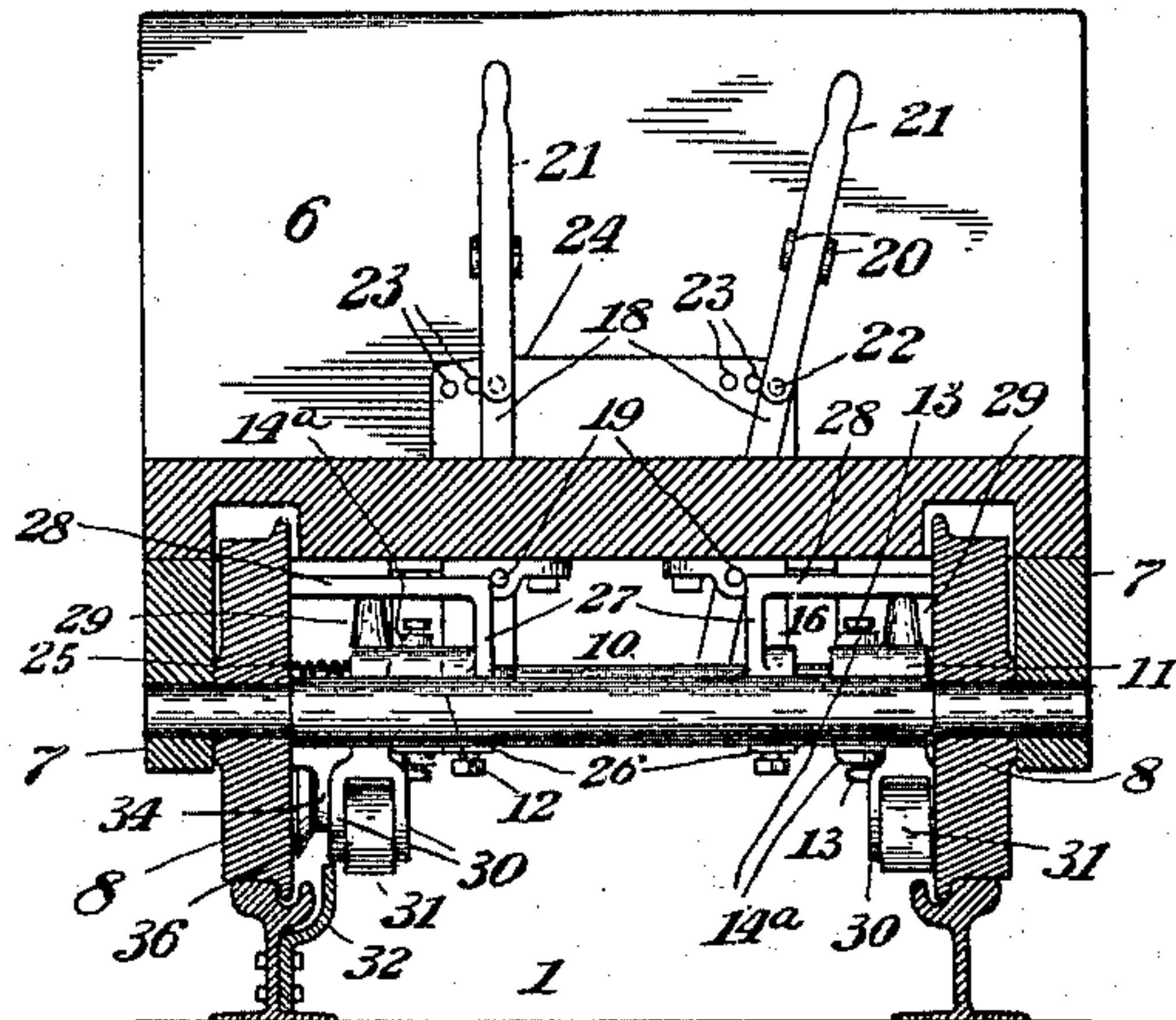


Fig. 3

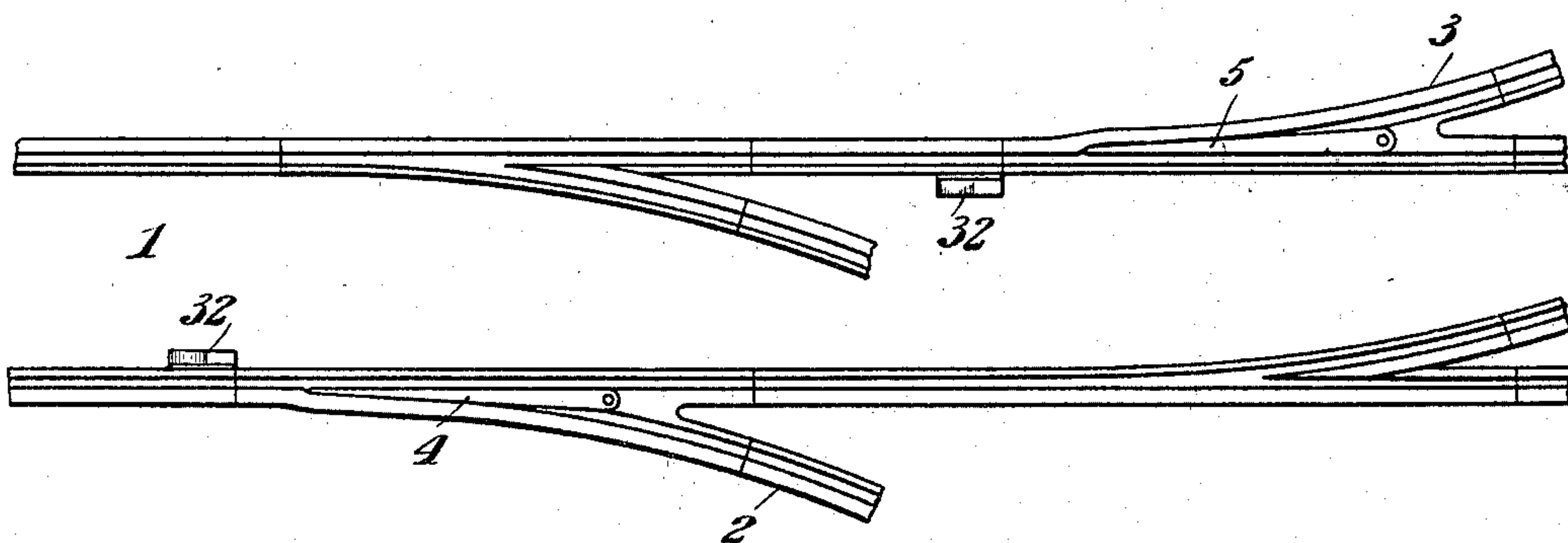


Fig. 4

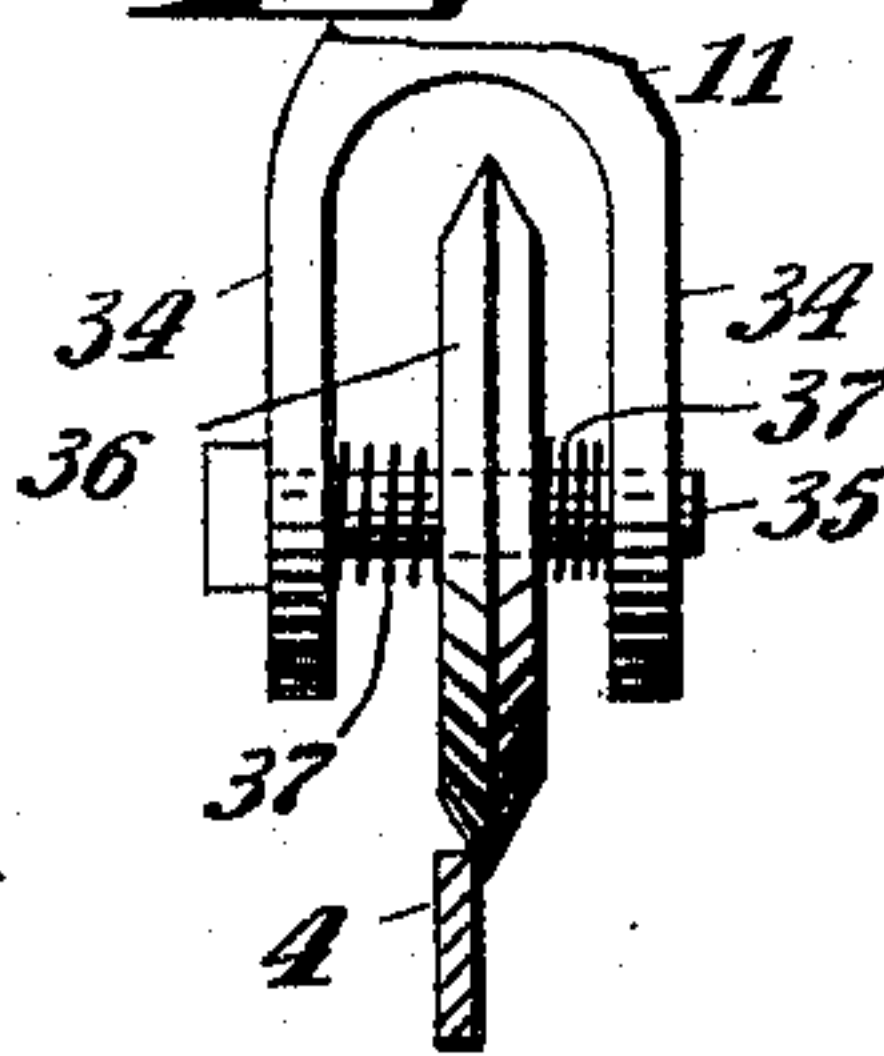


Fig. 5

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UNITED STATES PATENT OFFICE.

JOHN G. GROSHEIM AND GEORGE L. SEAMAN, OF CINCINNATI, OHIO.

SWITCHING APPARATUS FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 598,705, dated February 8, 1898.

Application filed September 21, 1897. Serial No. 652,445. (No model.)

To all whom it may concern:

Be it known that we, JOHN G. GROSHEIM and GEORGE L. SEAMAN, citizens of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Switching Apparatus for Street-Cars; and we 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification. This invention relates to certain improvements in switch-actuating devices such as are especially adapted for use upon street-railway lines; and the object of the invention is to provide a device of this character of a simple and inexpensive nature which shall be adapted to be carried upon the car in position for use by the motorman for throwing the several switch points or tongues along the route of the car, the device being capable of convenient adjustment to enable the switch points or tongues to be moved in either direction and being also capable of being thrown entirely out of operative position.

The invention consists in a switch-actuating device comprising a lever mounted for pivotal movement of the car, one end of the lever being normally in position to strike a plate or projection located upon the track adjacent to the switch-point to be operated, and the other end of the lever being adapted, when the lever is swung pivotally by engagement with said plate or projection, to be engaged with the switch-point to move the same laterally and open or close the switch.

The invention also contemplates certain novel features of the construction, combination, and arrangement of the several parts of the improved switch-actuating device, whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In order that our improvements may be the better understood, we have illustrated in the

accompanying drawings one embodiment of the invention, in which—

Figure 1 is a longitudinal section taken vertically through the forward part of a car provided with a switch-actuating device constructed according to our invention. Fig. 2 is an under side or inverted plan view of the front part of the car, showing the devices carried beneath the same. Fig. 3 is a vertical section taken transversely through the car in the plane of the fore axle and looking toward the front end thereof. Fig. 4 is a fragmentary plan view showing a portion of a line of railway having switches adapted to be actuated by our improved device. Fig. 5 is an enlarged detail view showing the means for mounting the roller employed for engaging and shifting the switch points or tongues.

In the views, 1 indicates the railway, having any desired number of switches 2 and 3, leading, respectively, in opposite directions from the main line and controlled by pivoted switch points or tongues 4 and 5 in the ordinary way.

6 indicates the car-body, mounted upon a truck-frame 7, wherein are mounted the wheels 8, running upon the rails of the track 1.

As herein shown, the car-body 6 is provided with a platform at its front end, whereon the motorman may stand, as is usual in street-railway cars, but it will be evident that with some changes our improvements may be applied to cars intended for use on other than street-railway lines.

The truck-frame 7 is provided with forwardly-extending arms 9 at opposite sides, and said arms 9 are connected or tied together by a transverse shaft 10, extending across the truck-frame beneath the car-body and carrying the switch-actuating levers 11 11, one at each side of the car or adjacent to each rail of the track 1, each of said levers having a central projecting boss 12 fitting upon the shaft 10, upon which shaft the levers 11 are adapted for both pivotal and sliding movement.

The bosses 12 are provided with oppositely-projecting pins or lugs 13, which work in slots formed in forks 14^a on the ends of jointed levers 14, extending forward under the car-platform and pivoted, as indicated at 15, on the lower ends of brackets 16, depending under said platform. The forks 14^a embrace

the bosses 12 of levers 11, and the levers 14 are, by reason of their slotted connection with the pins or lugs 13 and of their jointed construction, adapted to compensate for any rocking or swaying of the car-body, to which the levers 14 are pivoted, upon the truck-frame, whereon the levers 11 are carried, and also to compensate for the pivotal movement of the levers 11 upon the shaft 10 when said levers are rocked or oscillated in setting the switch, as will be hereinafter explained.

The levers 14 swing pivotally in a horizontal plane, and in order to actuate them their forward ends are connected by means of links 17 with the lower ends of hand-levers 18, extending vertically up through the platform of the car, being pivotally mounted on brackets 19, secured under the platform. In this way the hand-levers 18 are brought within easy reach of the motorman standing on the platform, and each of said levers has at opposite sides of its upper part perforated lugs 20 bent upon it, between which lugs is pivoted a dog 21, having a pin 22 at its lower end in position to engage openings 23 in a guide-plate 24, extending across the platform and against which the hand-levers are arranged to work. Springs at the upper ends of the dogs 21 serve to hold said pins 22 engaged with the openings 23 of the guide-plate. By this construction it will be seen that when the hand-levers 18 are moved pivotally their connections with the switch-actuating levers 11 will serve to slide said levers 11 along the shaft 10, whereon they are carried, and, as herein shown, the sets of levers 11, 14, and 18 at opposite sides of the car are arranged to work in opposite directions, so that the movement of the levers 18 toward each other will act to slide or move the levers 11 toward each other also.

To limit the sliding movement of the levers 11 toward each other upon the transverse shaft 10, we employ stop-collars 26, adjustably secured on the shaft and provided with upwardly-extending arms 27, the upper ends of which are bent laterally outward or away from each other and flattened, as shown at 28, to form abutments against which engage buffer-springs 29, secured on the upper faces of the rear ends of the levers 11 and formed, by preference, of india-rubber, said springs being adapted to hold the levers with their forward ends raised and their rear ends depressed, as shown in Fig. 1. Springs 25 are coiled on the outer ends of the shaft 10, and by their engagement with the levers 11 serve to press the same normally inward or into engagement with the stop-collars 26, this being the inoperative position of the switch-actuating levers.

The rear end of each lever 11 is forked, as shown at 30, and between its forks is mounted to turn a roller 31, adapted for contact with a fixed cam-plate or projection 32, located just inside the track-rail, one of said plates 32 being arranged just in advance of each of the switch points or tongues, as indicated in

Fig. 4. Each cam-plate 32 has a forward beveled or inclined face upon which the roller 31 rides.

The levers 11 are bent outward or away from each other at their forward ends, as shown at 33 in Fig. 2, and said forward ends are also provided with forks or bifurcations 34, between which extend pivot pins or screws 35, carrying rollers 36, held between the forks and having beveled peripheries adapted, when the forward ends of the levers are depressed by the engagement of the rear ends thereof with the cam-plates 32, to be forced down into engagement with the switch point or tongue, so as to move the same laterally and thereby set the switch. To lessen the impact of the rollers 36 with the switch tongues or points and also to permit the rollers to accommodate themselves laterally to the said switch tongues or points, we preferably arrange buffer-springs 37 on the pivot pins or screws 35 on each side of the rollers thereon, these springs permitting, by their compression, a slight movement of the rollers transversely of the track 1.

As shown herein, there are three openings 23 at each side of the guide-plate 24, corresponding to the three positions in which the levers 18 may be set, it being of course understood that the lever mechanisms at both sides of the car are substantial duplicates, one being intended for operating the tongues or switches leading to one side and the other for operating those leading to the other side of the straight line or main track. As stated above, when the levers 18 are moved toward each other the levers 11 are also slid toward each other upon the shaft 10, the springs 25 acting to facilitate this result.

When either of the levers 18 is in its innermost position, as shown at the left in Figs. 2 and 3, it will stand perpendicularly, and its dog 21 will be engaged with the innermost opening 23 at that end of the guide-plate 24. At the same time the corresponding lever 11 will be in engagement with the stop-collar 26 at its end of the shaft 10, and the wheel or roller 31 at the rear end of the said lever 11 will be moved inward to the position shown in Fig. 3, so as to be out of line with the cam-plate or projection 32, so that the lever will not be moved by said cam-plate.

When the lever 18 is in its intermediate position, its dog 21 being engaged with the middle opening 23 of guide-plate 24, the lever 11 will be correspondingly slid outward upon the shaft 10, so that if the switch be open the beveled periphery of the wheel or roller 36 will be engaged with the inner surface of the said switch point or tongue and will serve to press the same outward or away from the inner wall of the rail-slot, so as to close the switch in order that the car may remain upon the straight track, as will be readily understood.

In the third position of the parts, where the dog 21 of lever 18 is engaged in the outer-

most opening 23 in the guide-plate 24, the switch-actuating lever 11 will also stand in its outermost position, as shown at the right in Figs. 2 and 3, and when the parts are in this position the engagement of the roller 31 with cam-plate 32 will serve to throw down the forward end of the lever 11 and insert the beveled periphery of the roller 36 between the outer surface of the switch point or tongue (should the switch be closed) and the wall of the rail-slot, so as to open the same and permit the car to pass out upon the curve or switch.

From the above description of our improvements it will be seen that the switch-actuating device constructed according to our invention is of an extremely simple and inexpensive nature and is especially well adapted for the purposes for which it is designed, since when set by the motorman it is automatic in its action and is not liable to become deranged or broken. It will also be obvious from the above description that the device is susceptible of considerable modification without material departure from the principles and spirit of the invention, and for this reason we do not wish to be understood as limiting ourselves to the precise form and arrangement of the parts herein set forth.

Having thus described our invention, we claim—

1. A switch-actuating mechanism consisting of a lever mounted for pivotal movement on the car and having one end adapted to strike a cam or projection along the track adjacent to the switch point or tongue to be actuated, the other end of the lever being adapted, when the lever is swung pivotally by engagement with said cam or projection, to be engaged with the switch point or tongue to move the same laterally, substantially as set forth.

2. A switch-actuating mechanism consisting of a lever mounted for pivotal movement on the car and having one end adapted to strike a cam or projection along the track adjacent to the switch point or tongue to be moved, the other end of the lever being adapted, when the lever is swung pivotally by engagement with said cam or projection, to be engaged with the switch point or tongue to move the same laterally, said lever being also adapted for lateral movement to permit of engagement with either side of the switch point or tongue to move the said switch point or tongue in either direction, substantially as set forth.

3. A switch-actuating mechanism consisting of a lever mounted for pivotal movement on the car and having one end adapted to strike a cam or projection along the track adjacent to the switch-point to be actuated, the other end of the lever being adapted, when the lever is swung pivotally by engagement with said cam or projection, to be engaged with the switch-point to move the same lat-

erally, and means to move the said lever transversely of the track, substantially as set forth.

4. A switch-actuating mechanism consisting of a lever mounted for pivotal movement on the car and also adapted for movement transversely of the track, one end of the lever being adapted for engagement with a cam or projection along the track adjacent to the switch-point to be actuated, and the other end of the lever being adapted, when the lever is swung pivotally by engagement with the cam or projection, to engage and move the switch-point transversely, and means to move the lever transversely of the track to bring it out of the path of said cam or projection, substantially as set forth.

5. A switch-actuating mechanism consisting of a lever mounted for pivotal movement on the car and having one end adapted to strike a cam or projection along the track adjacent to the switch-point to be actuated, the other end of the lever being provided with a roller having a beveled periphery adapted for engagement between the wall of the rail-slot and the side of the switch-point to move the switch-point laterally when the lever is swung pivotally by engagement with said cam or projection, substantially as set forth.

6. A switch-actuating mechanism comprising in combination a switch-actuating lever mounted for pivotal movement on the car and, also adapted for engagement with a cam or projection along the track adjacent to the switch-point to be moved, and the other end of said lever being adapted for engagement with the switch-point to move the same when the lever is swung pivotally by engagement with said cam or projection, lever mechanism on the car and a connection between the lever mechanism and the switch-actuating lever whereby when the former is operated the said switch-actuating lever is moved transversely of the track to vary its engagement with the switch-point or with said cam, substantially as set forth.

7. A switch-actuating mechanism comprising in combination a switch-actuating lever mounted for pivotal movement on the car and also adapted for movement transversely of the track, one end of the lever being adapted for engagement with a cam or projection along the track adjacent to the switch-point to be moved and the other end being adapted for engagement with the switch-point to move the same when the lever is swung pivotally by engagement with said cam or projection, a hand-lever pivoted on the car and a lever connection between the hand-lever and the switch-actuating lever whereby the latter is moved transversely of the track by the movement of the hand-lever, substantially as set forth.

8. A switch-actuating device comprising in combination a switch-actuating lever adapted for engagement with the switch-point to be moved, a horizontal shaft whereon the lever

is mounted for sliding movement transversely of the track, mechanism connected to the lever for moving the same, and means to lock the switch-actuating lever in position, substantially as set forth.

9. A switch-actuating device comprising in combination a switch-actuating lever adapted for engagement with the switch-point to be moved, a horizontal shaft whereon the lever is mounted to move transversely of the track, a spring to move the lever in one direction, mechanism to move the lever in the opposite direction and a locking device to hold the lever against movement, substantially as set forth.

10. A switch-actuating device comprising in combination a switch-actuating lever adapted for engagement with the switch-point to be moved, a horizontal shaft whereon the lever is mounted for pivotal movement and also for sliding movement transversely of the track, and mechanism for moving the lever transversely of the track, said mechanism comprising a lever having slotted engagement with the switch-actuating lever, substantially as set forth.

11. A switch-actuating device comprising in combination a shaft, a switch-actuating lever mounted for pivotal and sliding movement on said shaft and adapted for engagement with the switch-point to be moved, and

a lever for sliding said switch-actuating lever on the shaft and provided with forks embracing the opposite sides of said switch-actuating lever, said forks having slots to receive pins on the switch-actuating lever, substantially as set forth.

12. In a switch-actuating device, the combination of a shaft, a switch-actuating lever mounted for pivotal and sliding movement on the shaft and adapted for engagement with the switch-point to be moved, means for sliding the lever along the shaft, a stop-collar on the shaft and provided with an arm having a lateral extension, and a spring carried by the lever and having engagement with said extension, substantially as set forth.

13. In a switch-actuating device, the combination of a lever carried on the car, a pivot-pin on the lever, a roller on the pivot-pin and adapted for engagement with a switch-point to be moved, and springs to engage the opposite sides of the roller to permit the same to move laterally to accommodate itself to said switch-point, substantially as set forth.

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

JOHN G. GROSHEIM.
GEORGE L. SEAMAN.

Witnesses:

JOHN ELIAS JONES,
J. D. THORNE.