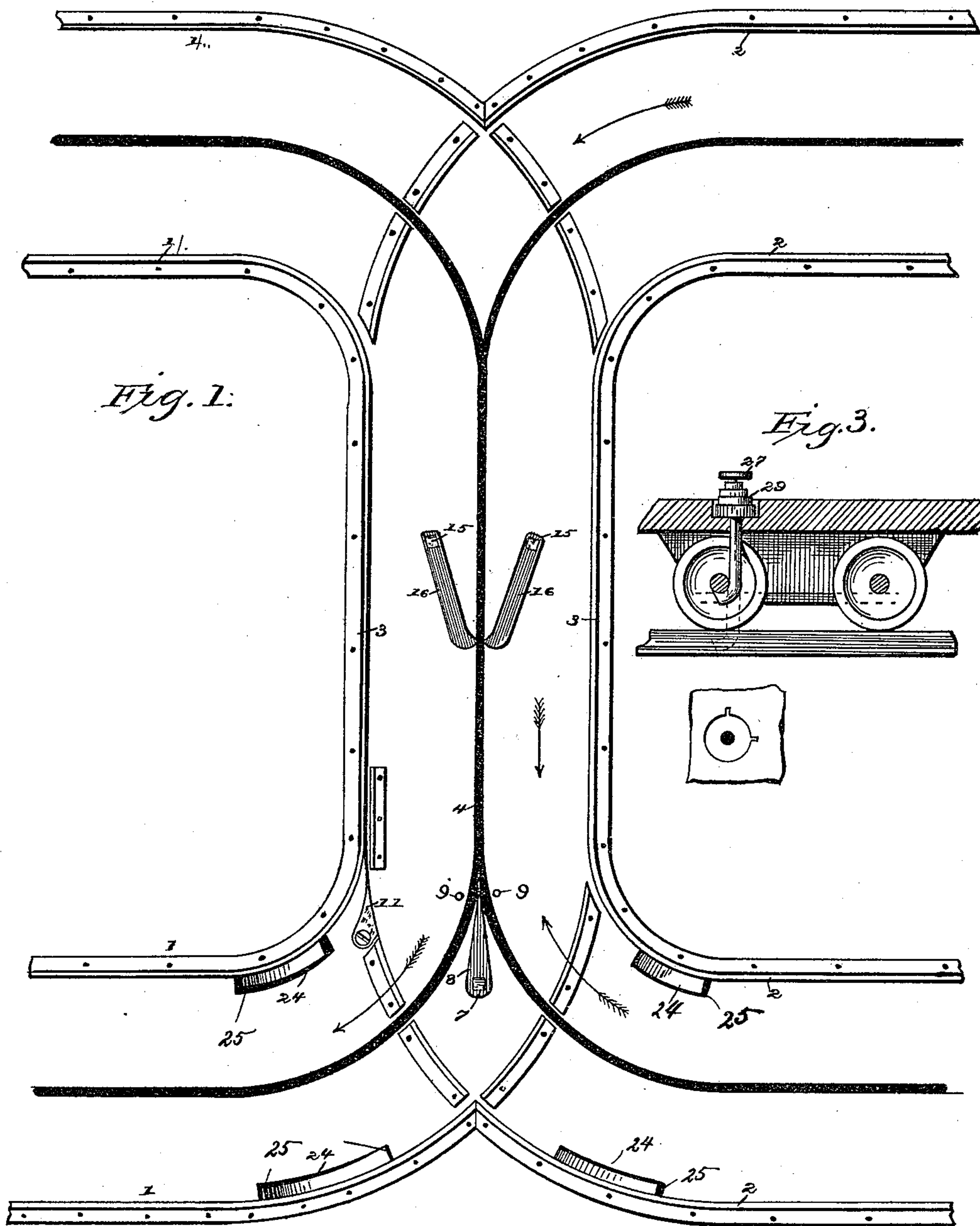


3 Sheets—Sheet 1.

No. 438,650.

Patented Oct. 21, 1890.



Witnesses
S Bates
C M Bates

Geo. A. Stafford and ^{Inventors} A. S. Robinson
By their Attorney Wm. C. Bates

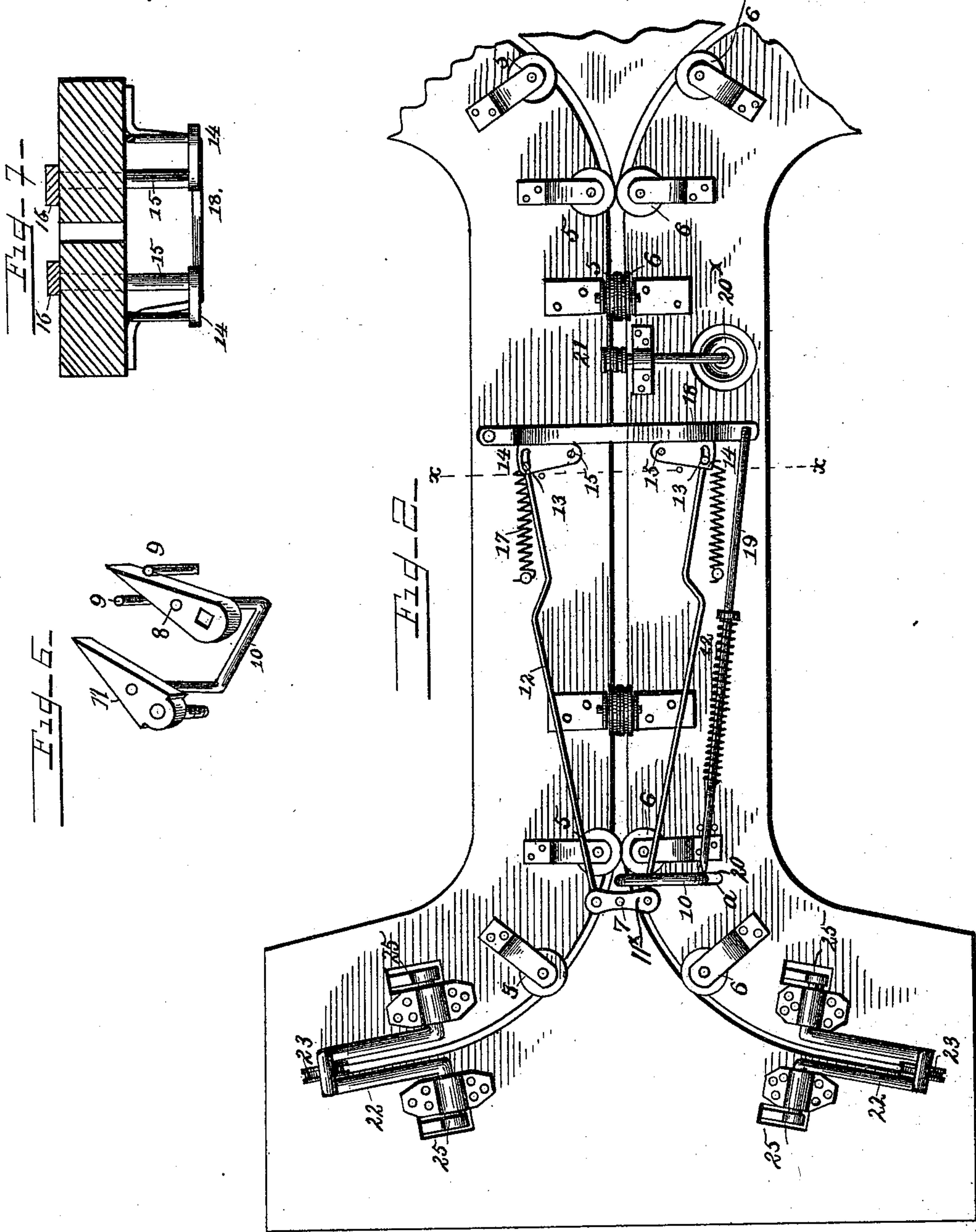
(No Model.)

3 Sheets—Sheet 2.

G. A. STAFFORD & A. S. ROBINSON.
SWITCH FOR CABLE RAILWAYS.

No. 438,650.

Patented Oct. 21, 1890.



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(No Model.)

3 Sheets—Sheet 3.

G. A. STAFFORD & A. S. ROBINSON.
SWITCH FOR CABLE RAILWAYS.

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Fig. 5.

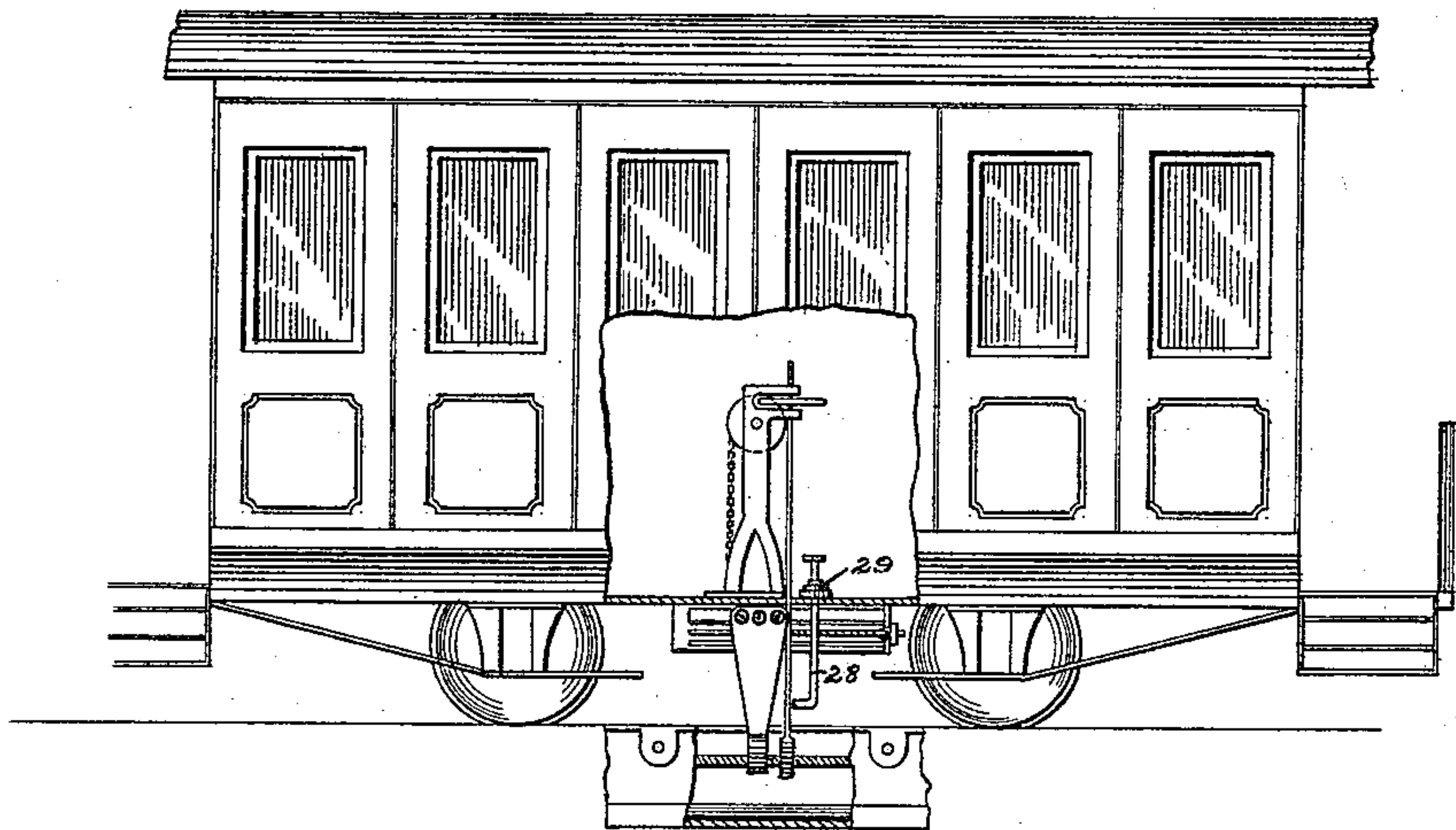
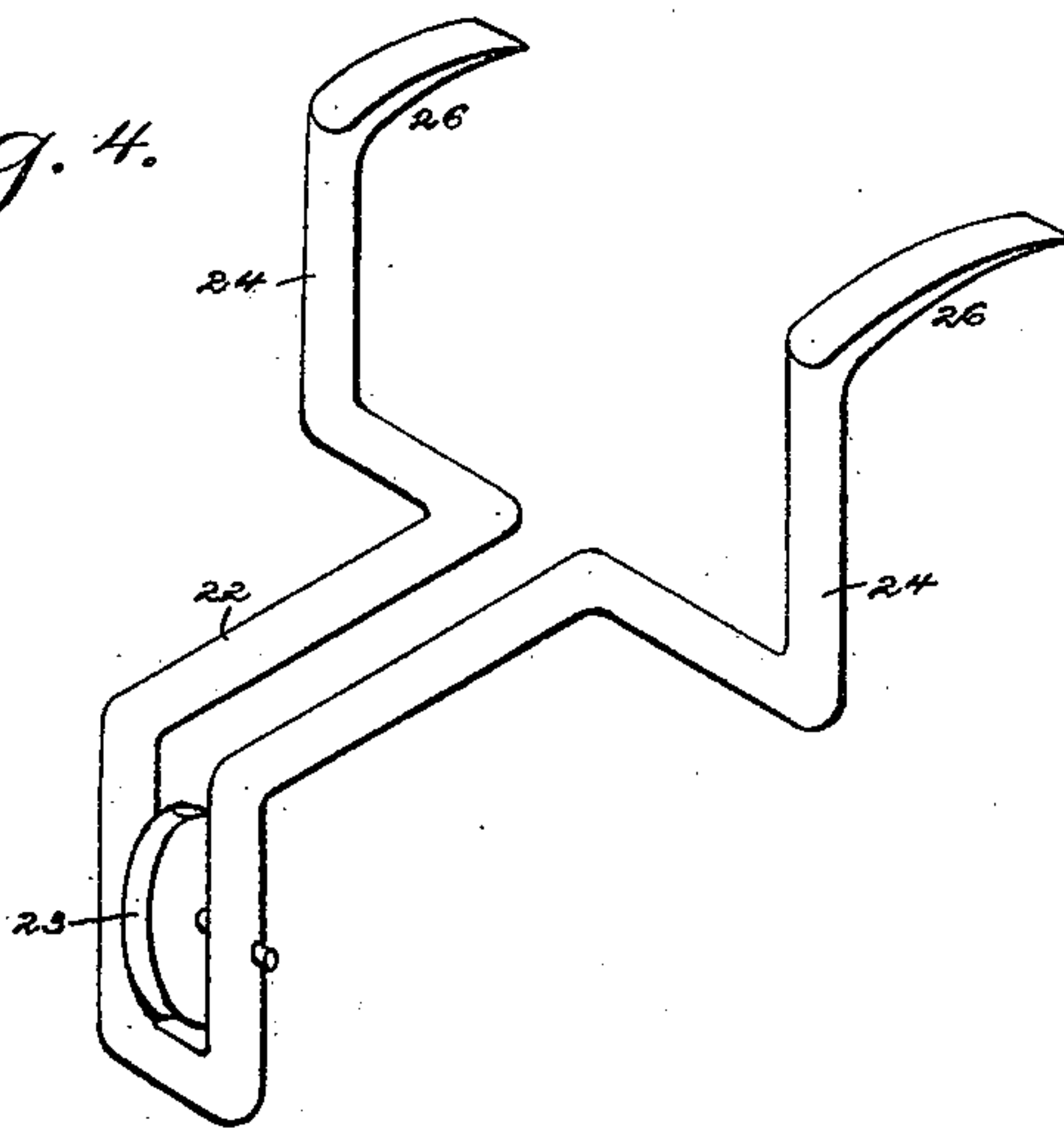


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE A. STAFFORD AND ALBERT S. ROBINSON, OF RATON, TERRITORY
OF NEW MEXICO.

SWITCH FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 438,650, dated October 21, 1890.

Application filed November 9, 1889. Serial No. 329,809. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. STAFFORD and ALBERT S. ROBINSON, citizens of the United States, residing at Raton, in the county of Colfax and Territory of New Mexico, have invented certain new and useful Improvements in Switches for Cable Railways; 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.

Our invention has relation to improvements in slot-switches in cable railways, and the objects are, first, to provide improved means for directing the gripper into its proper slot of a road-bed where cars coming over the same track are switched in opposite or different directions; second, to provide improved means for switching cars of different tracks running for a distance over a single track in different directions at the terminus of the single track, and, third, to simplify and improve existing means employed to effectuate the switching of cable-cars.

Our invention therefore consists in the novel construction of parts, and their combination or operative aggroupment, as will be hereinafter fully described, and specially as the same is particularly pointed out in the claims.

We attain the objects of our invention by means of the mechanisms illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of a cable-railway road-bed having our improvements applied. Fig. 2 is a bottom plan view of the same, showing the mechanism in operative aggroupment. Fig. 3 is a longitudinal section of a car having the spring foot-levers applied, by which the switch mechanism is operated from the car, with a small plan view of the spring-seat shown below. Fig. 4 is a detail perspective of the means for lifting the cable to the gripper after the car has been switched from the straight section of track. Fig. 5 is a view showing a car with gripper on the track. Fig. 6 is a detail of the switch-points. Fig. 7 is a transverse section through the road-bed on the line xx of Fig. 2, showing the construction of the lever which operates the plunger-rod.

Referring to the drawings, 1 1 (see Fig. 1)

designate a track, and 2 2 another track coming from a different direction, and both curving into a common or single track 3 3 and then curved in opposite directions, as shown in the drawings. In the road-beds is the usual slot 4, through which the gripper projects below the road-bed to grasp the cables.

In the conduit are mounted the cable-sheaves to carry the cable for the respective lines of cars, these being designated by 5 and 6, the sheaves on the straight line of track between the curves being double and mounted on same journals or shafts.

At the point between the junction of the slots is arranged a vertical shaft 7, on the projecting upper end of which is fixed the slot-switch point 8, the forward end of which extends beyond the junction of the slots and sweeps over the main slot, its movements being limited by studs 9, placed in the road-bed, as shown.

About the middle of the slot-switch is secured one arm of a shifting-bar 10, the other arm of which is projected up through the road-bed and fixed in a switch-piece 11, pivoted on the road-bed and arranged to open and close against the rail to direct the car in the desired direction. The shifting-bar 10 is given a limited play in slots a in the bed. (See Fig. 2.)

On the lower end of the shaft 7 of the slot-switch is a cross-head 11^x, to the ends of which are connected pull-rods 12, having their other ends arranged in slots 13 in arms 14 on shafts 15, projected through the road-bed, and having on the projecting ends levers 16, which are arranged to incline from their pivotal point inward to the slot, substantially as shown, to engage the operating-bars on the cars. The levers 16 are returned to their normal position after being moved to throw the switches by spring 17, suitably attached to the arms 14 and to the under side of the road-bed. The switch-points are, however, held in position to which turned by the plunger-bar, hereinafter described.

Across the under side of the road-bed is a lever 18, having attached to its free end a spring plunger-rod 19, the free end of which engages on either side of a lug 20 on the shifting-bar 10. This lever, with its plunger-bar, is

disengaged from the lug by the movements of the arms 14, bearing against the lever 18, when either of the levers 16 is moved and returned by the spring on the bar, when engagement of the arms with the lever ceases. This plunger-bar by engagement with the lug on the shifting-bar 10 holds the switch-point in the position to which it may be swung or moved by the action of the levers 16. The lever 18 is either arched or bent, so that the part extending across the road-bed is below and out of the way of the gripper, as shown in Fig. 7 of the drawings.

20^x designates an alarm-bell secured to the road-bed and operated by an arm fulcrumed on the road-bed and carrying a sheave or sheaves 21 on the other end. The object of this alarm is to give notice when the gripper releases the cable by the cable dropping down on the sheave and causing the arm to strike the bell.

22 designates a cable-lifter designed to lift the cable into gripping position after the car has been switched in the desired direction. This cable-lifter consists of a hanger carrying a sheave 23 and mounted in bearings on the road-bed, as shown, and having vertically-directed arms 24 projected through slots 25 in the road-bed. The vertical arms 24 are struck down and curved, as shown at 26, to be engaged by the wheels of the car in passing over. This engagement lifts the sheave and with it the cable, and the gripper can again take hold.

In the floor of the gripper-car are two holes suitably located so as to be convenient to the foot of the gripman. In these holes are disposed step-levers 27 28, having their lower ends formed to engage the inner faces of the respective levers 16 and push these levers outward to turn the switch mechanism.

In seats in the car-bottom about the step-levers are arranged springs 29, which exert their force to lift the step-levers and hold them raised when not in use. These step-levers are made detachable, and may be lifted out of their positions and turned about with their ends directed in opposite direction to suit the direction of the travel.

The operation is as follows: As the car comes onto the single track from either of the directions indicated, the grip is released before the gong is reached, the release being indicated by the alarm. The foot of the gripman is then applied to the proper step-lever, which brings the end of the lever in position to engage the switch-lever on the road-bed, which, through the instrumentality of the connections below the bed to the switches, throws these elements in the direction required, and the car is switched accordingly. After the car turns the curve the cable-lifter arms are

engaged and the cable lifted into location for gripping, which being accomplished the car proceeds, as usual.

Having thus described our invention, so as to distinguish it from prior inventions in the art, we now proceed to particularly point out and specify the parts and combinations we claim as our invention, as follows:

1. In a cable-road switch, the combination of switch-levers pivoted on the road-bed and provided with arms on the lower ends of their shafts, a slot-switch pivoted on a vertical shaft at the junction of the curves, a cross-head on the lower end of the vertical shaft of the slot-switch, connecting-rods secured to the cross-head and arms of the switch-levers, a switch-tongue in the curve of one of the tracks, and a bar connecting the slot-switch and the switch-tongue, substantially as described.

2. In a cable-road switch, the combination of a slot-switch, a track-switch connected to the slot-switch, levers on the road-bed to shift the slot-switch and track-switch at one time, a lever under the road-bed arranged to be moved by the shifting-levers, and a plunger-rod on the lever under the road-bed to engage the connections of the slot-switch and track-switch and lock them in position, substantially as described.

3. The combination of a slot-switch mounted on a vertical shaft at the junction of the intersecting slots of the road-beds, a track-switch pivoted on the road-bed at the curve, a shifting-bar connecting the said switches, a lever provided with a spring-plunger to engage the shifting-bar and hold it in locked position, and levers operated from the car to throw the switches and unlock the shifting-bar, substantially as described.

4. In a cable-track, the cable-lifter journaled under the road-bed and carrying a sheave and having arms extending upward through the road-bed, with their upper ends struck down on the road-bed and adapted to be engaged by the wheels of the car, substantially as described.

5. In a cable-road, the cable-lifter herein described, consisting of a hanger fulcrumed under the road-bed, a sheave in the hanger, and arms projected from the hanger above the road-bed, said arms being arranged along the tracks, substantially as and for the purpose specified.

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

GEORGE A. STAFFORD.
ALBERT S. ROBINSON.

Witnesses:

MARSHALL A. YEAGER,
JONATHAN H. HUNT.