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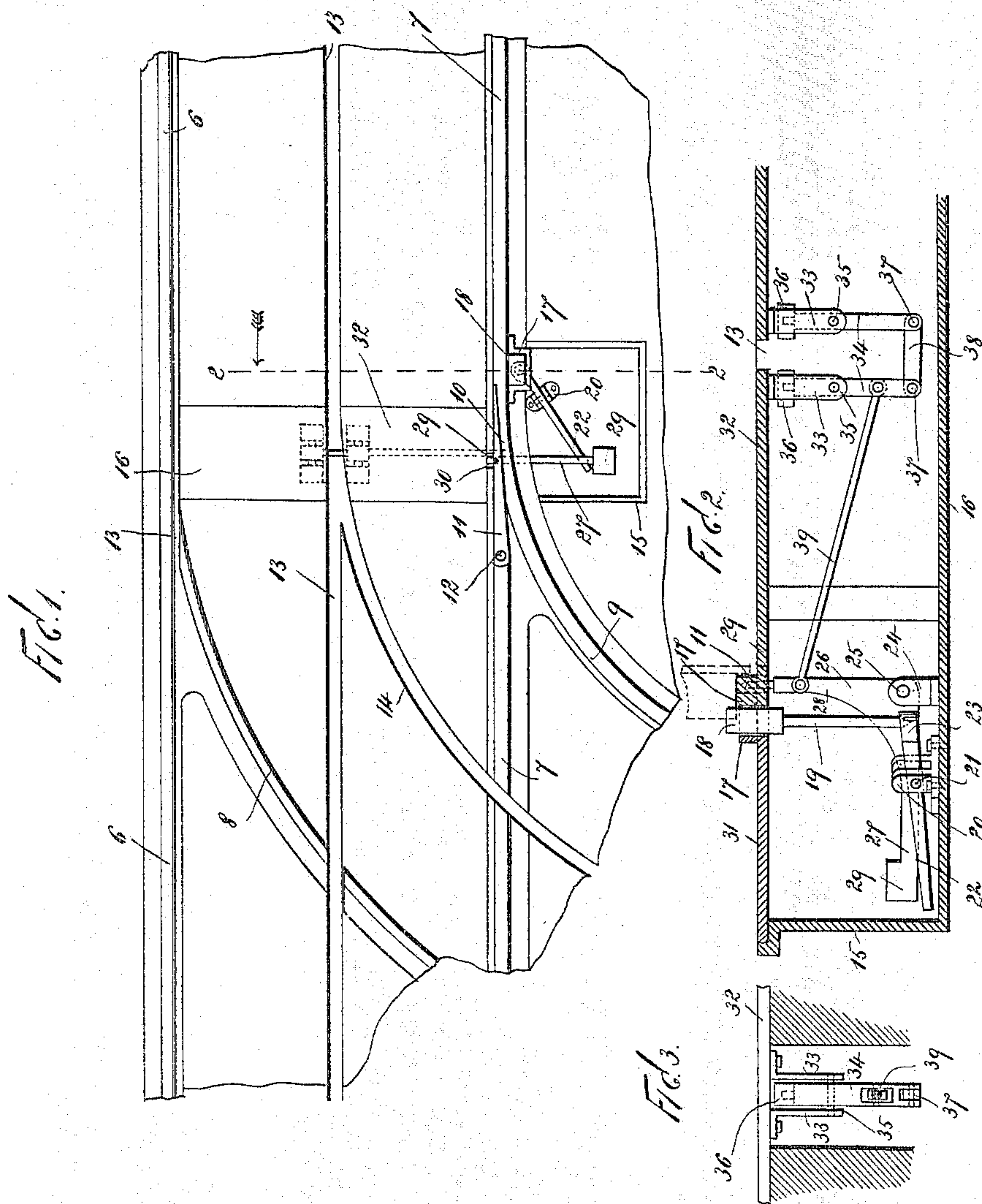
Patented Jan. 2, 1900.

J. S. MILLS.  
RAILWAY SWITCH MECHANISM.

(Application filed Oct. 26, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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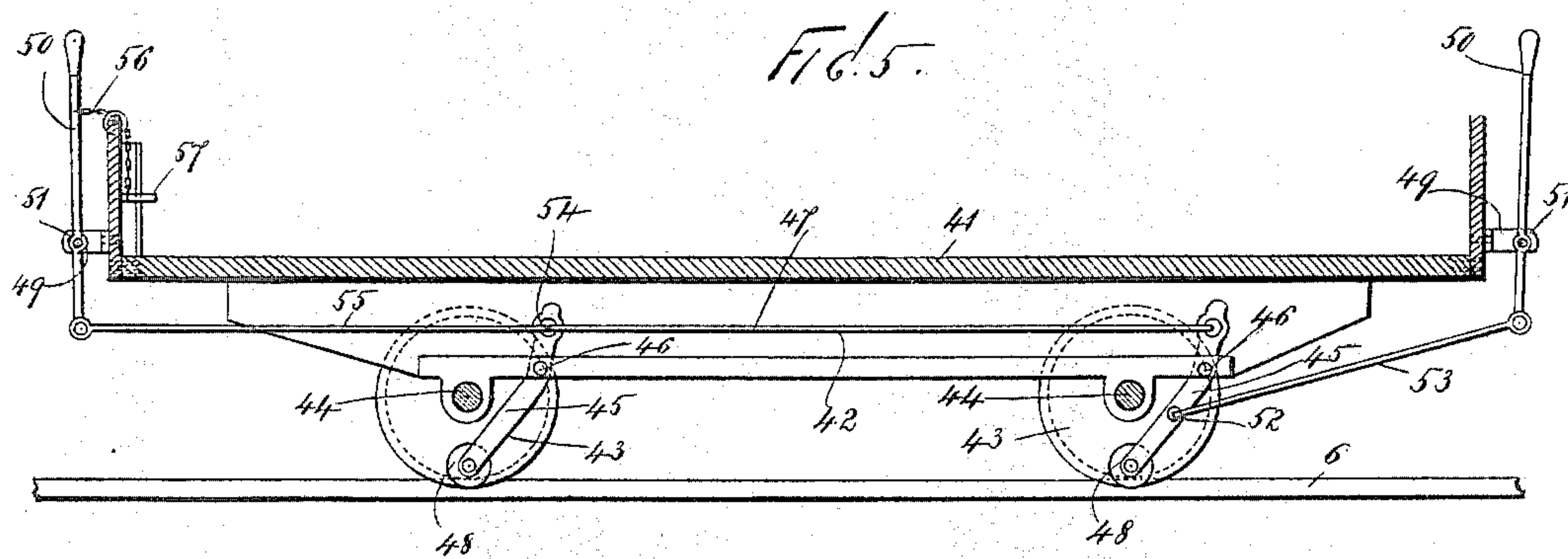
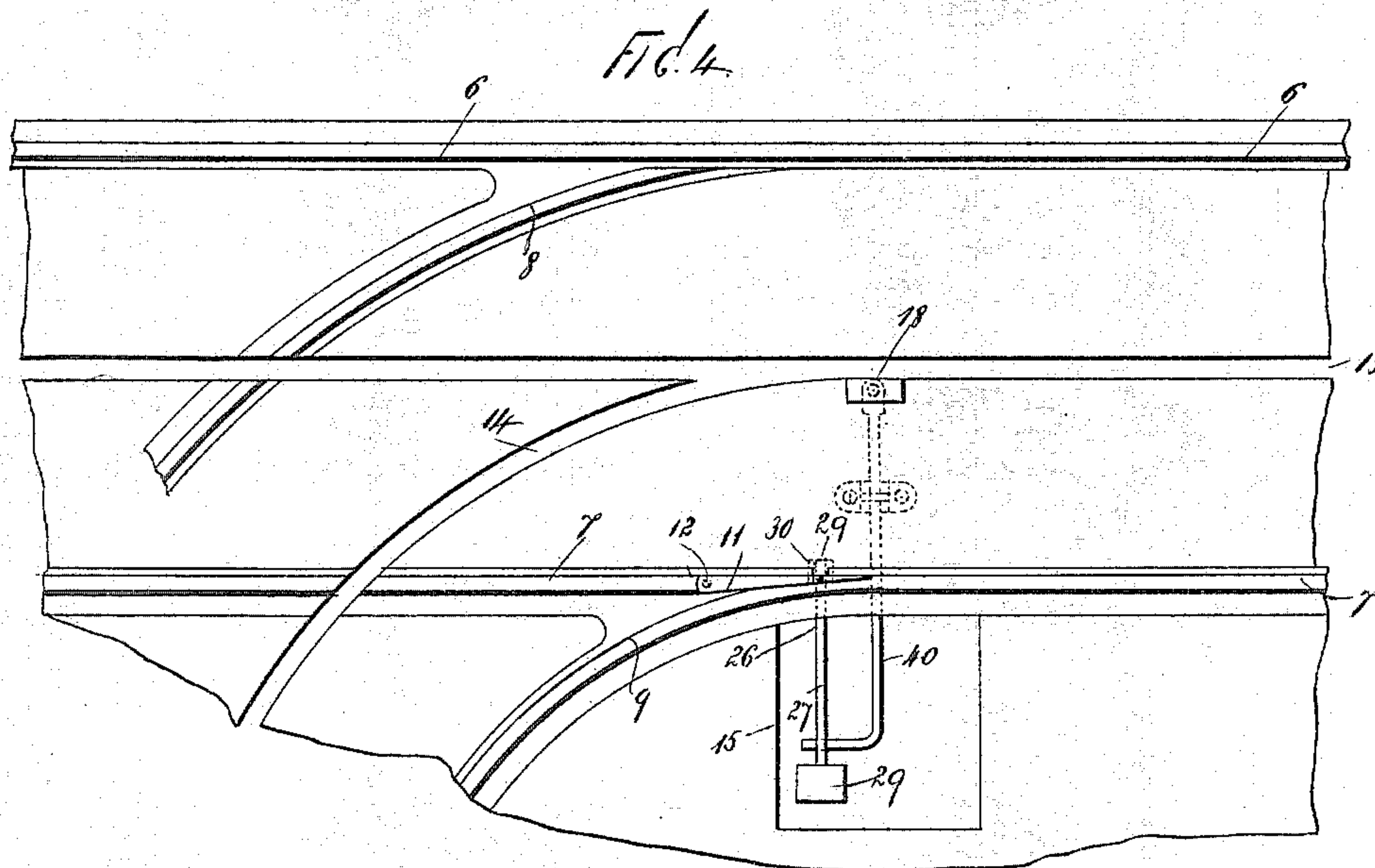
Patented Jan. 2, 1900.

J. S. MILLS.  
RAILWAY SWITCH MECHANISM.

(Application filed Oct. 28, 1899.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## RAILWAY-SWITCH MECHANISM.

SPECIFICATION forming part of Letters Patent No. 640,480, dated January 2, 1900.

Application filed October 26, 1899. Serial No. 734,818. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN S. MILLS, a citizen of the United States, residing at New York, (Long Island City,) in the county of Queens and State of New York, have invented certain new and useful Improvements in Railway-Switch Mechanism, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to railway-switches; and the object thereof is to provide a switch which may be operated automatically by a car traveling upon the railway and which it is desired to move over the switch.

My invention consists in the construction and arrangement of parts as fully disclosed in the following specification, of which the accompanying drawings form a part, in which like reference characters denote like parts in the several views, and in which—

Figure 1 is a plan view of a portion of the tracks of a railway and showing my improved switch installed in connection therewith; Fig. 2, a section thereof on the line 2 2 and on an enlarged scale; Fig. 3, a side view of a detail thereof; Fig. 4, a plan view of a modification of the construction shown in Figs. 1, 2, and 3; and Fig. 5, a section of a car construction which I employ in connection with the track and switch construction shown in Fig. 4.

Referring more particularly to the drawings and to Figs. 1, 2, and 3 thereof, I have shown at 6 and 7, respectively, the two main rails of a railway and at 8 and 9 two branch rails from and onto which it is intended that my improved switch shall allow a car to pass, respectively, onto and from the main rails 6 and 7. The rail 7 is provided adjacent its connection, which is integral, as at 10, with a switch-point 11, pivoted to the rail 7, as at 12, and the end of the branch rail 8 is slightly spaced from the rail 6, as at 13, in the customary manner.

It is evident that if a car be moving upon the tracks 6 and 7 in the direction of the arrow in Fig. 1 and the switch-point 11 be in the position shown in the drawings, said car will continue to move in the same direction and that if the switch-point 11 be moved pivotally away from the junction-point 10 of the tracks

7 and 9 said car will pass upon the branch tracks 8 and 9 in the customary manner.

Intermediate of the rails 6 and 7 I provide in the road-bed a slot 13, and a similar branch slot 14 communicates therewith and extends intermediate of the branch rails 8 and 9. These slots are employed when the railway is a cable, underground trolley, or similar railway and the cars take their motive force from a conducting or transmitting element beneath within a suitable conduit or chamber in the road-bed.

In the practice of my invention I arrange a casing 15 in the road-bed of the railway and at one side thereof and provided with an extension 16, communicating therewith and extending beneath and between the rails 6 and 7. I also arrange a keeper 17 at the outer side of the rail 7, and slidably mounted therein is a vertically-movable plunger-head 18, mounted upon a plunger-rod 19. The plunger-head 18 is arranged adjacent the junction-point 10.

Fixed to the bottom of the casing 15 is a bifurcated standard 20, in which is pivoted at 21 a lever-arm 22, provided at its shorter end with a head 23, in which the plunger-rod 19 rests pivotally, as clearly shown in Fig. 2, and the arm 22 extends laterally and obliquely from the plane of the adjacent track 7. Another bifurcated standard 24 is fixed to the bottom of the casing 15, and pivoted therein, as at 25, is a bell-crank lever 26, consisting of a laterally-directed arm 27 and an upwardly-directed arm 28. The arm 27 is weighted at its outer end, as at 29, and the longer end of the lever 23 extends beneath the arm 27 of said bell-crank lever, the relative arrangement and construction of the respective parts being such that when said plunger-head 18 is depressed the arm 28 of the bell-crank lever will be thrown laterally.

The upper end of the arm 28 rests normally beneath the outer end of the switch-point 11 and is provided with a pin 29, which passes upwardly through a slot 30 in the base of the track 7 and engages pivotally with said switch-point 11, as shown in Figs. 1 and 2.

The casings 15 and 16 are provided with covers 31 and 32, which are detachable, the cover 31 being shown as detached in Fig. 2. The keeper 17 is connected with said cover



31, as shown in Fig. 2, the said cover being slotted to allow the plunger-head 18 to pass therethrough.

Connected with the casing-top 32 and at either side of the slot 13, as shown in Fig. 2 and in dotted lines in Fig. 1, is a pair of depending brackets 33, and between the brackets of each of said pairs is pivoted, as at 35, an arm 34, and each of said arms is pivoted nearer one end than the other and provided at its upper end with a head 36. The lower ends of the arms 34 are pivotally connected, as at 37, by a link 38, and a rod 39 is pivoted at one end to the upper end of the arm 28 of the bell-crank lever 26 and at the other end to the adjacent arm 34, as clearly shown in Fig. 2.

The operation of the switch and connected apparatus above described will be clearly evident from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof.

As a car is moved upon the tracks 6 and 7 in the direction indicated by the arrow one of the forward wheels will engage the plunger-head 18, as shown in dotted lines in Fig. 2, and will depress the same before said wheel arrives at the junction-point 10 of the rails 7 and 9. As the wheel depresses the plunger-head 18 and plunger-rod 19 the bell-crank lever 26 is operated by the arm 22, and the pin 29 moves the switch-point 11 laterally. The flange of the wheel then travels between the said switch-point and the junction-point 10 and the wheel rides onto the branch track 9, the corresponding wheel upon the track 6 riding correspondingly onto the branch track 8, and the entire car is thus automatically switched from the main tracks 6 and 7 onto the branch tracks 8 and 9. When the bell-crank lever 26 is operated as above, the rod 39 is simultaneously moved to oscillate the arms 34 and swing one of the heads 36 out into the plane of the slot 13, thus guiding the shoe or other power-transmitting device which operates in said slot from the slot 13 into the branch slot 14. A portion of the flange of the wheel which operates the plunger-head 18 passes between the track 7 at the junction-point 10 and the switch-point 11 before the said wheel has entirely ceased engagement with the plunger-head 18, and the moment such engagement ceases the plunger-head 18 rises under actuation of the weight 29, the switch-point 11 returning to its normal or closed position also under the actuation of said weight. It is evident, therefore, that each wheel which operates upon the track 7 must operate the plunger-head 18 independently to throw the switch-point 11.

In Figs. 4 and 5 I have shown a modified form of construction in which the main tracks 6 and 7, branch tracks 8 and 9, switch-point 11, casing 15, bell-crank lever 26, plunger 18, and plunger-rod 19 are all the same in construction and arrangement as in Figs 1 and 2, with the exception that the plunger-head 18 is arranged adjacent to the middle of the

road-bed or intermediate of the tracks 6 and 7 and the plunger-rod 19 engages pivotally at its lower end with the shorter end of a lever-arm 40, which is pivotally mounted in a standard shown in dotted lines and the longer end of which lies normally beneath the arm 27 of the bell-crank lever 26.

In Fig. 5 is shown a car which is provided with means for actuating the switch mechanism shown in Fig. 4. The trucks of the car 41 are shown at 42 and are provided with the usual wheels 43, mounted upon axles 44, journaled in said trucks. A crank-lever 45 is pivoted to the trucks 42, as at 46, adjacent each of the wheels 43, and the upper ends of said crank-levers are pivotally connected by a link-rod 47, the lower end of each of said crank-levers being provided with a roller 48. Each end of the car 41 is provided with a bracket 49, in which is pivoted an operating-lever 50, as at 51, and one of these is connected with the adjacent crank-lever 45 and with the lower arm thereof, as at 52, by a link-rod 53, and the other thereof is connected with the upper end of the adjacent crank-lever 45, as at 54, by a link-rod 55. One of the operating-levers 50 is provided with a chain 56, by means of which it may be locked in connection with a pin 57, fixed in the adjacent end of the car.

The operation of the switch apparatus and actuating devices shown in Figs. 4 and 5 is evident from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof. As the foremost wheel 43 nears the switch-point 11 one of the operating-levers 50 is operated to depress the lower ends of the crank-levers 45, bringing the rollers 48 into the horizontal plane of the plunger-heads 18. As the latter is depressed by one of the rollers 48 the rod 40 operates the bell-crank lever 27 to throw the switch-point 11, and the wheel of the car passes between the said switch-point and the rail 7, switching the car onto the tracks 8 and 9.

The wheels of the car intended to operate the switch-point 11 in Figs. 1 and 2 are provided with treads broader than customarily, which engage the plunger-head 18, but the wheels of the car 41 are of the usual or any preferred form.

I do not wish to be understood as limiting myself to the exact construction and arrangement of parts above specified, but reserve the right to vary the same without departing from the spirit of my invention.

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

1. A switch mechanism of the class described for use in connection with a railway, the bed of which is provided with a slot in which a power-transmitting member operates, comprising a depressible element arranged in the road-bed of said railway, a movable switch-point, a bell-crank lever, one arm of which is



weighted and the other arm of which is in operative connection with said switch-point, said bell-crank lever being in operative connection with said depressible element, and an arm pivoted adjacent said slot and operatively connected with said bell-crank lever, substantially as shown and described.

2. A switch mechanism of the class described, for use in connection with a railway, the bed of which is provided with a slot in which a power-transmitting member operates, comprising a depressible element arranged in the road-bed of said railway, a movable switch-point, a bell-crank lever one arm of which is weighted and the other arm of which is in operative connection with said switch-point, said bell-crank lever being in operative connection with said depressible element, a bracket arranged at either side of said slot, an arm pivoted in each of said brackets, said arms being pivotally connected, and one of said arms being operatively connected with said bell-crank lever, substantially as shown and described.

3. In an apparatus of the class described and adapted for use in connection with a railway provided with a slot in which a power-

transmitting member operates, a bracket arranged upon either side of said slot, an arm pivotally connected with each of said brackets, each of said arms being provided with a head at its upper end, said arms being connected at their lower ends by a pivoted link, and means for oscillating said arms, substantially as shown and described.

4. In an apparatus of the class described, a pivoted switch-point, a bell-crank lever provided with an upright arm which is pivotally connected with said switch-point, and with a laterally-directed weighted arm, a pivoted rod one end of which projects beneath said weighted arm, and a plunger arranged adjacent the track in connection with which said switch operates, said plunger being operatively connected with said rod, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 24th day of October, 1899.

JOHN S. MILLS.

Witnesses:

F. A. STEWART,  
M. M. COOPER.