E. HOWARD.

AUTOMATIC RAILWAY SWITCH.

APPLICATION FILED JULY 22, 1909.

960,017.

Patented May 31, 1910.

4 SHEETS—SHEET 1.

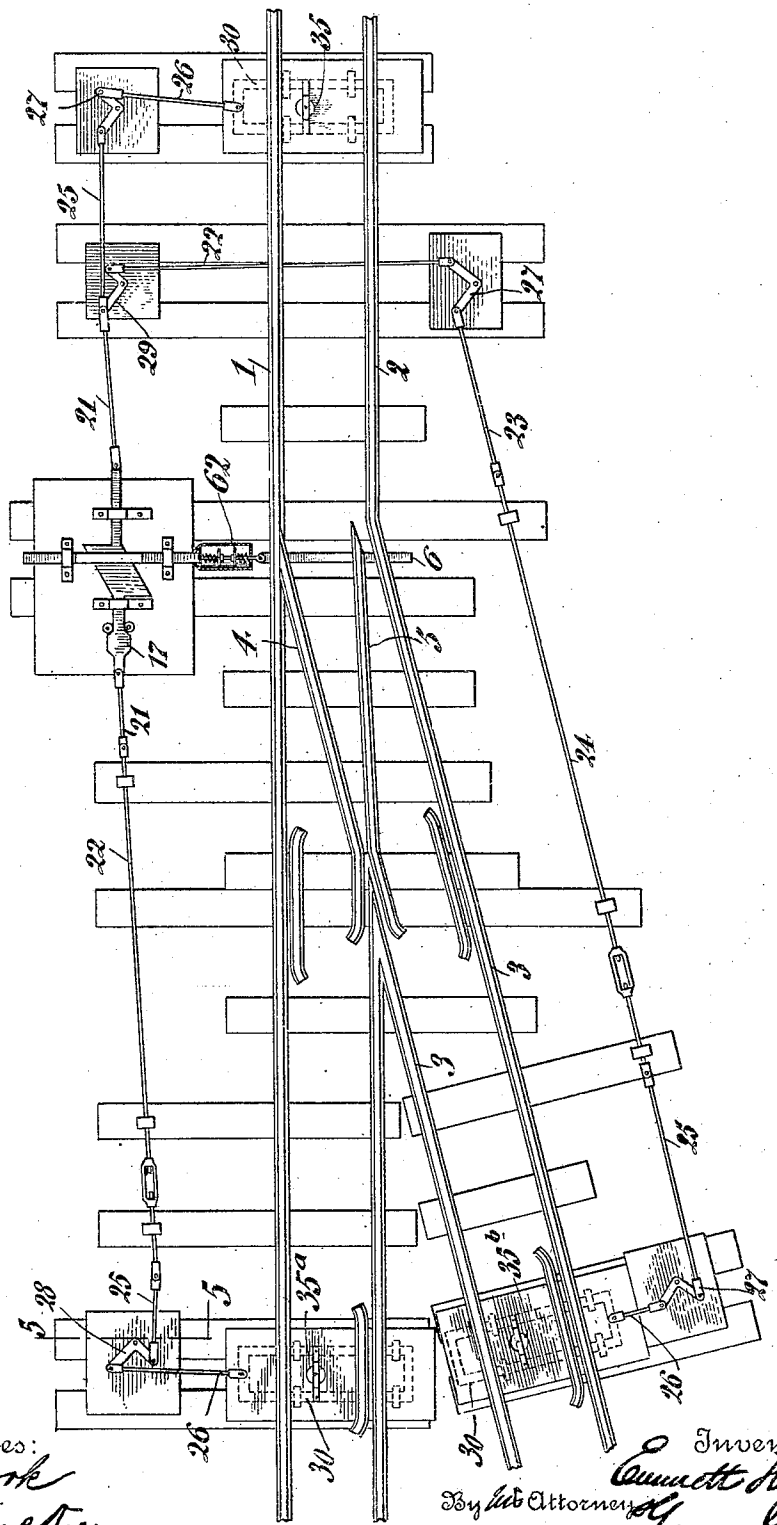

Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 3.

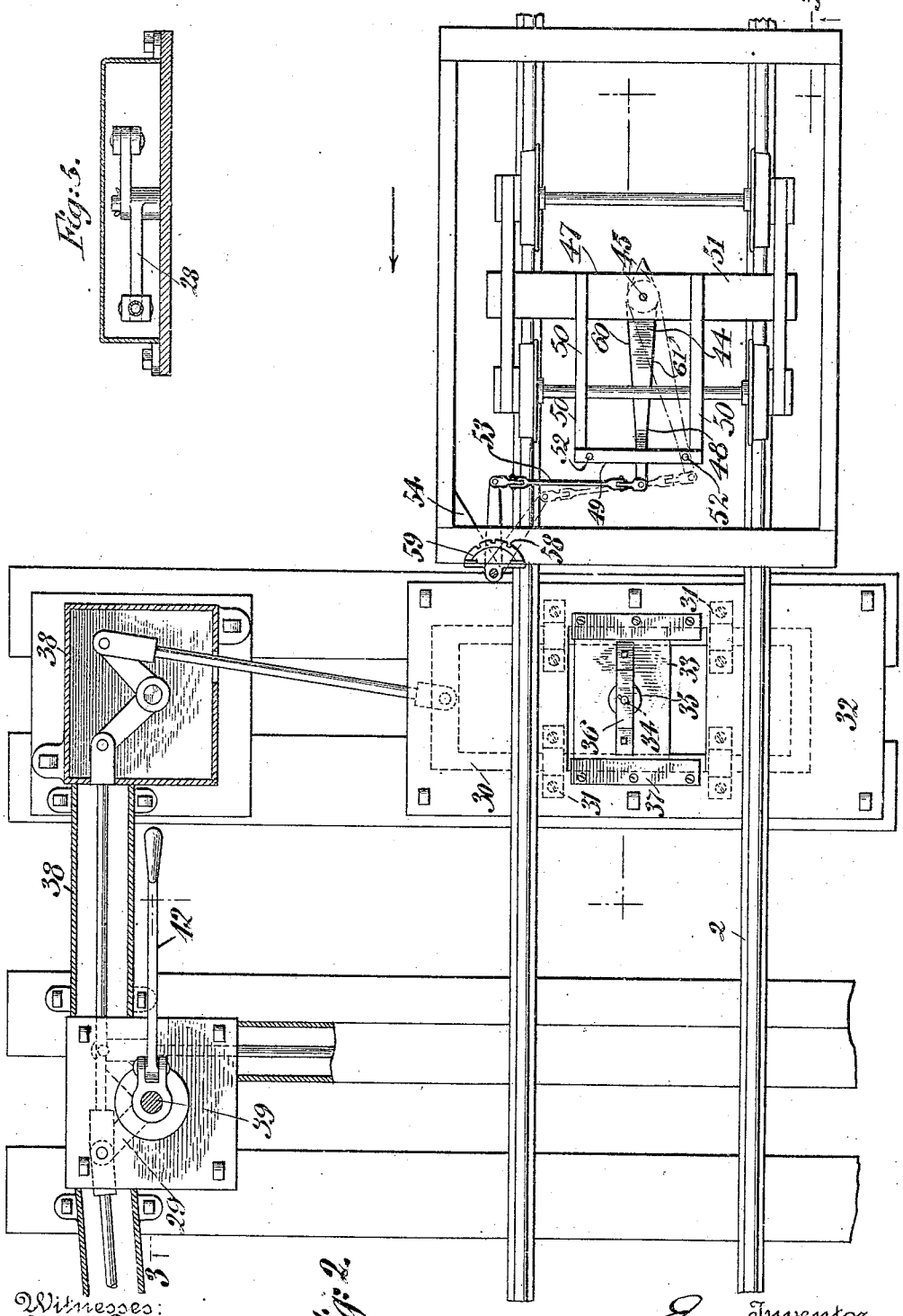

Fig. 2.

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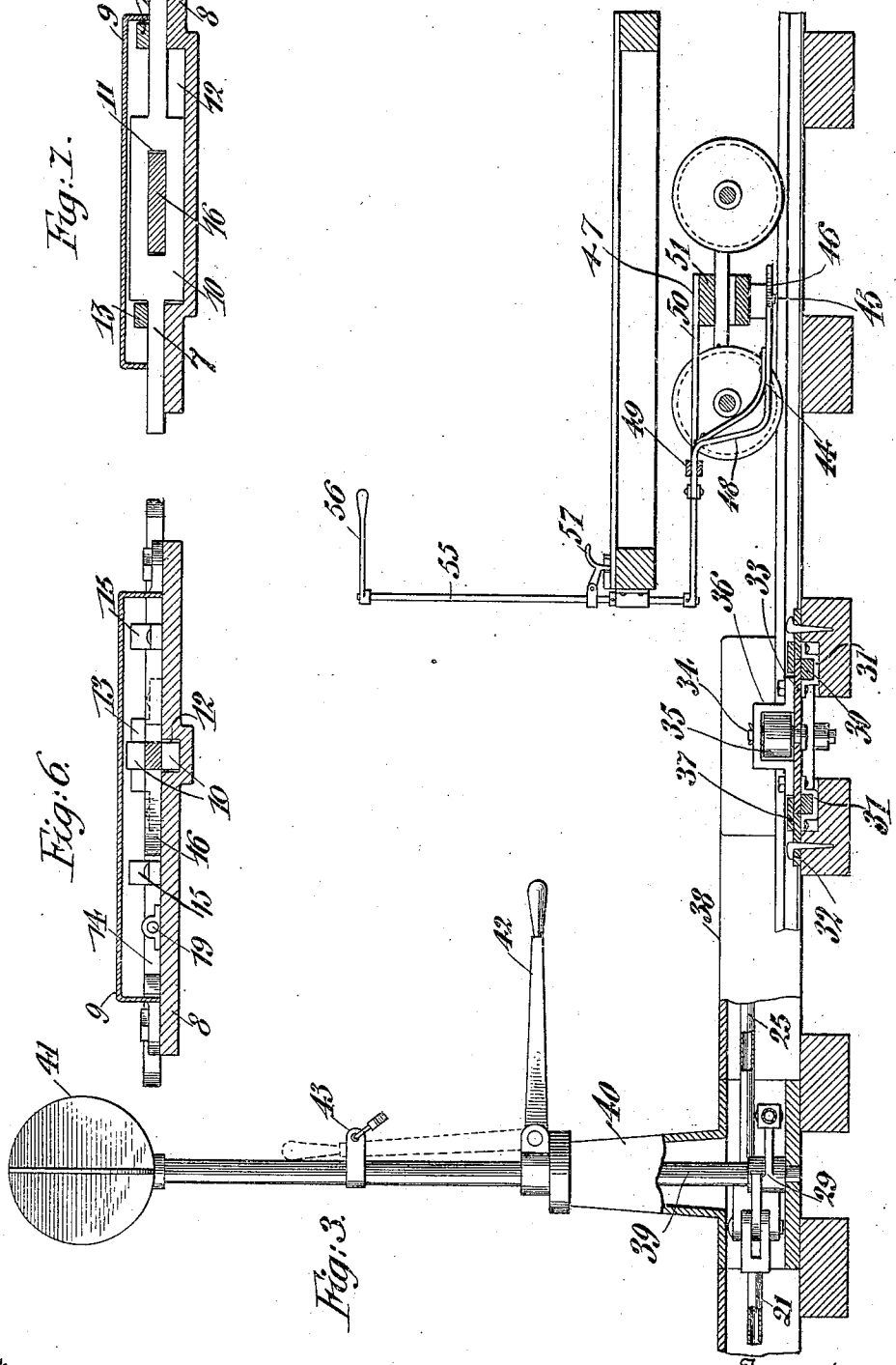
4 SHEETS—SHEET 3.

Fig. 7.

Fig. 6.

Fig. 3.



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4 SHEETS—SHEET 4.

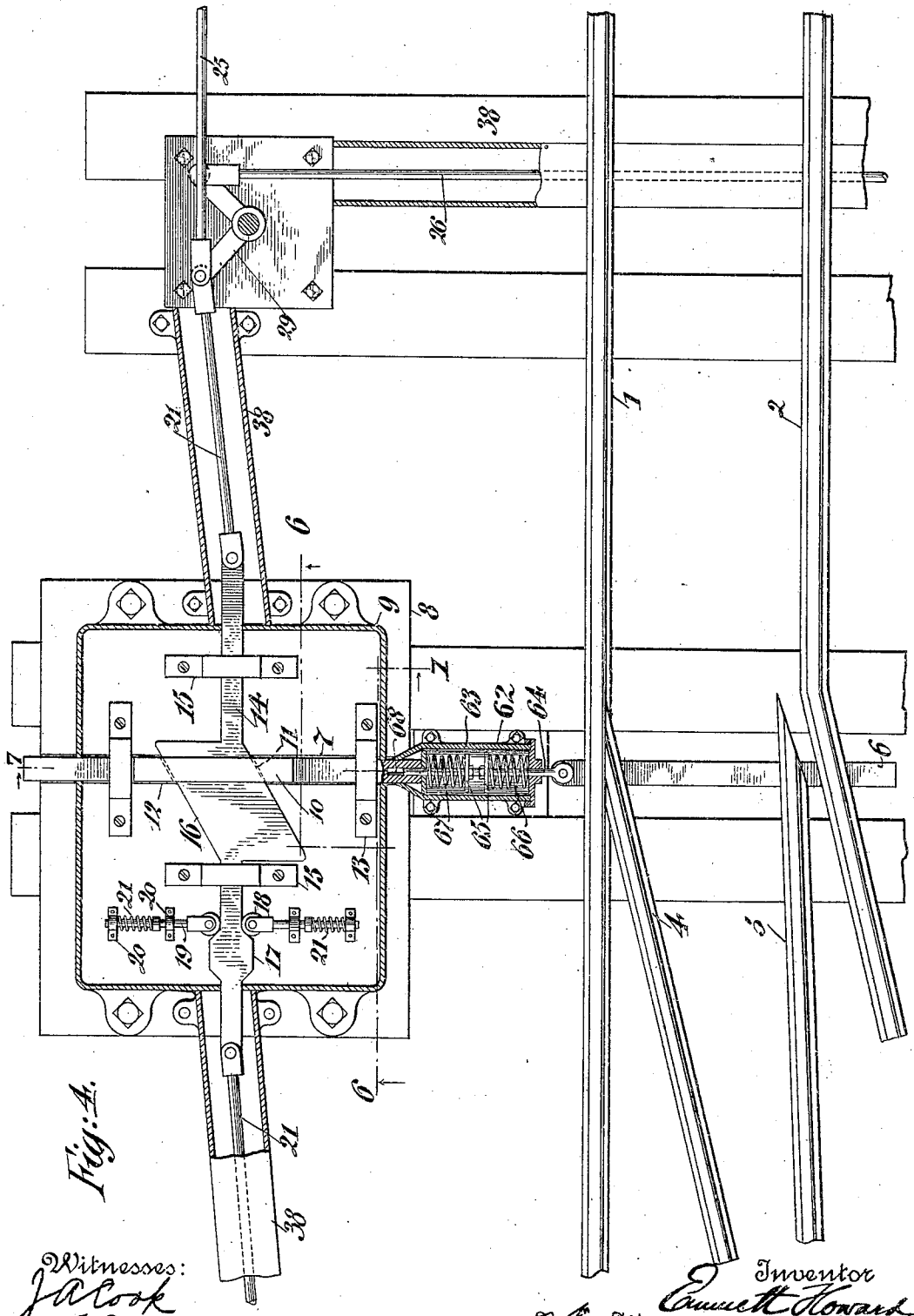

Fig. 4.

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UNITED STATES PATENT OFFICE.

EMMETT HOWARD, OF EUGENE, OREGON, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE HOWARD AUTOMATIC RAILWAY SWITCH COMPANY, OF EUGENE, OREGON, A CORPORATION OF OREGON.

AUTOMATIC RAILWAY-SWITCH.

960,017. Specification of Letters Patent. Patented May 31, 1910.

Application filed July 22, 1909. Serial No. 508,930.

To all whom it may concern:

Be it known that I, EMMETT HOWARD, a citizen of the United States of America, residing in Eugene, county of Lane, State of Oregon, have invented certain new and useful Improvements in Automatic Railway-Switches, of which the following is a specification.

This invention relates to automatic switches of the kind which are adapted to be operated by a device carried on the tender or car or some other part of a moving train and adapted to be controlled by the engineer or member of the train crew as desired.

The object of this invention is to produce a device of this kind which will at all times render the switches under full control of the engineer of the moving train and at the same time act as a safety device to prevent the train from running into open switches or leaving the main line except when desired.

To this end my invention consists in the construction of an improved switch-operating means, which will be fully described hereinafter and the novel features of which will be pointed out in the appended claims.

In the annexed drawings forming a part of this specification and in which like reference characters indicate like parts throughout, Figure 1 is a plan-view showing the application of the switch-operating means to the switch, Fig. 2 is a plan-view partly in horizontal section showing on a larger scale a portion of the track leading to the switch, a railway truck thereon and certain parts of the operating device, Fig. 3 is a sectional view, taken on the line 3—3 of Fig. 2, Fig. 4 is a plan-view partly in horizontal section showing certain parts, Fig. 5 is a vertical sectional view partly in elevation taken on the line 5—5 of Fig. 1, and Figs. 6 and 7 are sectional views taken on the lines 6—6 and 7—7 respectively of Fig. 4.

Referring more particularly to the drawings the device is shown in connection with a switch having the main line rails 1 and 2, the rails 2 and 3 of the siding and the usual movable points 4 and 5. Near the free ends of the points is attached the tie-rod or bar 6 connected as will be explained to the sliding bar 7 sliding upon the base-plate 8 of the cam-box 9 and having an intermediate enlargement 10 provided with an oblique opening 11 passing therethrough. The enlargement 10 slides in a seat 12 provided in the base-plate 8 and the sliding bar is held in position by straps 13 fastened to the base-plate. (See Figs. 6 and 7).

A cam-bar 14 passes through openings in the ends of the cam-box being held in place by the straps 15, and is provided at its middle portion with a cam-block 16 snugly and slidably fitting in the oblique opening 11 and adapted by its movement to slide the bar 7. Between the cam-block and one end of the cam-bar is an octagonal enlargement 17 against the sides of which rollers 18 carried by rods 19 sliding in bearing steps 20 are adapted to press under the action of the helical springs 21.

The movement of the cam-block 16 and the bar 14 is limited by the straps 15 and the rollers 18 bearing against the inclined sides of the octagonal enlargement 17 yieldably hold said bar against accidental movement. Opposite ends of the cam-bar 14 have pivoted thereto rods 21 by which, through rods 22, 23, 24, 25 and 26 and bell-crank levers 27, 28 and 29, motion is transmitted to the cam-bar 14 from the sliding-frames 30.

The sliding-frames 30 slide in brackets 31 bolted to the supporting plates 32 which are spiked to the cross-ties. Across the side-pieces of the frames 30 are secured the roller-carrying plates 33, carrying the stub-shafts 34 on which are rotatably mounted the cylindrical rollers 35, 35^a and 35^b. Brackets 36 serve as additional holding means for said stub-shafts.

Plates 37 secured to the supporting plates 32 hold the roller carrying plates against upward displacement. Sleet-proof covering 38 are provided for the rods 21, 22, 23, 24, 25 and 26 and the levers 27, 28 and 29.

The levers 27 are simple bell-crank levers with both arms lying in the same plane, but in order to make all of the rollers 35 move in the same direction, the purpose of which will be explained, the levers 28 and 29 have one of the rods connected thereto crossing the vertical plane of movement of the other rod and for that reason the rods and levers must move in different horizon-

tal planes and the arms of the levers 28 and 29 move in spaced horizontal planes as shown in Figs. 3 and 5 respectively.

The bell-crank lever 29 is rigidly secured to the vertical shaft 39 rotatably mounted in the stand 40 and carrying the target 41, the hand lever 42 and locking means 43 by which the lever is locked in inoperative position. The rollers 35 are transversely shifted by means of a tapering shoe 44 having its rear and larger end pivoted as at 45 to the lower face of the lower beam 46 of the truck 47. The forward end 48 of the shoe is turned upwardly and forwardly and slides between the transverse spaced bars 49 secured to the forward end of parallel bars 50 secured to the upper face of the upper truck-beam 51. Pins 52, passing through the transverse bars 49, serve as stop shoulders for limiting the lateral movement of the forward end 48 of the shoe. A link 53 connects said forward end 48 with a lever 54 rigidly secured to the shaft 55 rotatably mounted on the truck and carrying a hand-lever 56. A catch-lever 57 pivoted for vertical movement relative to the shaft 55 but held against horizontal rotation therewith is adapted to engage in notches 58 in a plate 59 secured to the platform. Said plate 59 and the lever 56 may be located on top of a car or in any convenient location depending upon style of the car or tender.

Fig. 2 shows the truck approaching the switch and moving in the direction of the arrow. If it is desired to take the side-track, that is, the left-hand track, the lever 56 is moved to the left thus setting the shoe in the position shown in the dotted lines. As the truck passes the roller 35 the roller is engaged by the inclined edge 60 and, as the truck passes on, it forces the roller to pass along said edge and to assume the position shown in Fig. 2, the pivot 45 and the pin 52 receiving the force of the blow of the roller instead of transmitting it on to the link 53 and to the hand-lever 56. This movement of the roller 35 causes, by means of the connecting parts, the points 4 and 5 to take the position shown. After the train has passed over the switch, a shoe on the rear car is shifted to the right and engages the roller 35^b moving it to its right-hand limit of movement thus setting the switch for the main line. If, however, it is desired to leave the switch set for the side track, the shoe on the last car may remain in its mid position, as shown in full lines in Fig. 2, or it may be placed in the position shown in the dotted lines, but in either of these cases the roller 35^b will not be disturbed. If the train is to stay on the main line, the shoe 44 and lever 56 on the tender are set to the right thus causing the left hand edge 61 of the shoe to engage and move to the left the roller of any open switch, thus always automatically setting all switches for the main line and keeping the engine on the main-line without attention on the part of the engineer. If it is desired to set the switch for the side-track after the train has passed the switch onto the main line going in the direction of the arrow of Fig. 2, the shoe on the last car is set to engage and move the roller 35^b to the right, thereby setting the switch for the side-track.

A safety device 62 is provided to prevent the breaking of the switch points in case a car should pass off of the switch when the switch is closed. This safety device (see Fig. 4) comprises a housing 63, secured to the bar 7 and a rod 64 secured to the tie-rod 6 and passing longitudinally through the housing. Disks 65 are adjustably secured on the rod 64 and springs 66 and 67 are interposed between said disks and the adjacent ends of the housing. If a train should pass from the left hand end of the track as shown in Fig. 4 into the closed switch, the switch-points would be moved to the left by the flanges of the wheels, and the tie-rod 6 would move against the action of the spring 66 without at all moving the position of the bar 7, or the cam-block 16. If the switch were set for the main line and a car should move into it from the side track, the points and tie-rod would give against the action of the spring 67.

A bore 68 may be provided in the end of the sliding bar 7 for the reception of the end of the rod 64. While the springs 66 and 67 are resilient enough to give before the switch points are broken; they are stiff enough always to positively move the points when the switch is operated.

The shoe 44 is attached to the front truck of the tender, but for running backward one should also be attached to the rear truck and should point in the opposite direction to the one on the front truck. In like manner all the cars should be equipped with the shoes on each truck, but it is a great convenience if only the tender and rear cars are so equipped. If all the cars are equipped with the shoes, all of the shoes of the intermediate cars are placed in the mid-position and locked, so that they cannot be moved except by employees of the road, in which position they will pass without moving the rollers. In cutting out cars from a train, the lever 42 may be unlocked and the switches operated in the usual manner, if desired.

The advantages of this switch are, first, safety in preventing running into open switches, secondly, the shoe of the engine can be set to keep the train on the main line, which will be accomplished without further attention, third, saving of time in making a siding and passing open switches, fourth, saving of stopping and starting and therefore a saving of fuel.

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

1. In an automatic switch, the combination with the movable points, a sliding bar connected to the points and having an intermediate opening, a movable cam-block passing through said opening, means for yieldably holding said cam-block at either limit of movement, a movable roller, motion imparting means connecting said roller and said cam-block and means for engaging and operating said roller.

2. In an automatic switch, the combination with the movable points of a tie-rod secured to the points, a slide-bar, means for automatically moving said slide-bar, a housing secured to the slide-bar, a threaded rod secured to the tie-rod and passing longitudinally through the housing, disks on said threaded rod, springs interposed between the disks and the ends of the housing, and nuts on said threaded rod for adjustably holding said disks in position.

3. In a switch in combination with the movable points of a tie-rod, a base-plate having a recess in the bottom thereof, a sliding-bar secured to said tie-rod and having a central enlargement adapted to slide in said recess, said enlargement having an oblique central opening passing therethrough, a cam-block passing through said opening, and snugly received therein and adapted to move transversely thereof, and automatic means for moving said cam-block.

4. In a switch the combination with the movable points of a base-plate, a cam-bar slidable on said base-plate and having an enlargement near one end, rods slidably mounted on said plate, rollers carried on said rods and engaging said enlargement, collars on said rods, helical springs on said rods and engaging said collars to press said rollers against said enlargement, means for imparting movement to the cam-bar and means for communicating motion from the cam-bar to the points.

5. In a switch the combination with the movable points of a supporting-plate having an intramarginal opening, brackets secured to the under face of said plate, a frame slidable in said brackets, a roller-carrying plate mounted on the frame and in said opening, a stub-shaft secured on said roller-carrying plate, a roller on said shaft, an additional bracket mounted on the roller-carrying plate and having a bore receiving the upper end of the stub-shaft, vehicle carried means adapted to engage and move said roller and motion imparting means connecting said frame and said points.

6. In a railroad switch in combination with the movable points, the movable roller and motion imparting means connecting the roller and the points of a vehicle having a truck having upper and lower beams transversely extending spaced bars supported from said upper beam, a shoe adapted to engage said roller and pivoted at its rear-end to the lower face of the lower beam and having its upper and forward end passing between said spaced bars, a hand lever, means connecting said hand-lever and said forward end for imparting motion to the shoe, and pins connecting said spaced bars for limiting the lateral movement of said upper end.

7. In an automatic switch, the combination with the movable points of a tie-rod secured to the points, a sliding-bar having an oblique opening passing therethrough, resilient means connecting said rod and said bar a cam-block slidable transversely of said bar and passing through said opening, a sliding frame, a roller carried by said frame, movement imparting connecting means between said sliding frame and said cam-block, means to yieldably hold said cam-block at either limit of movement, and vehicle carried means adapted to engage and move said roller.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EMMETT HOWARD.

Witnesses:

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MAE GIBSON.