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W. S. BAILEY.

SWITCH.

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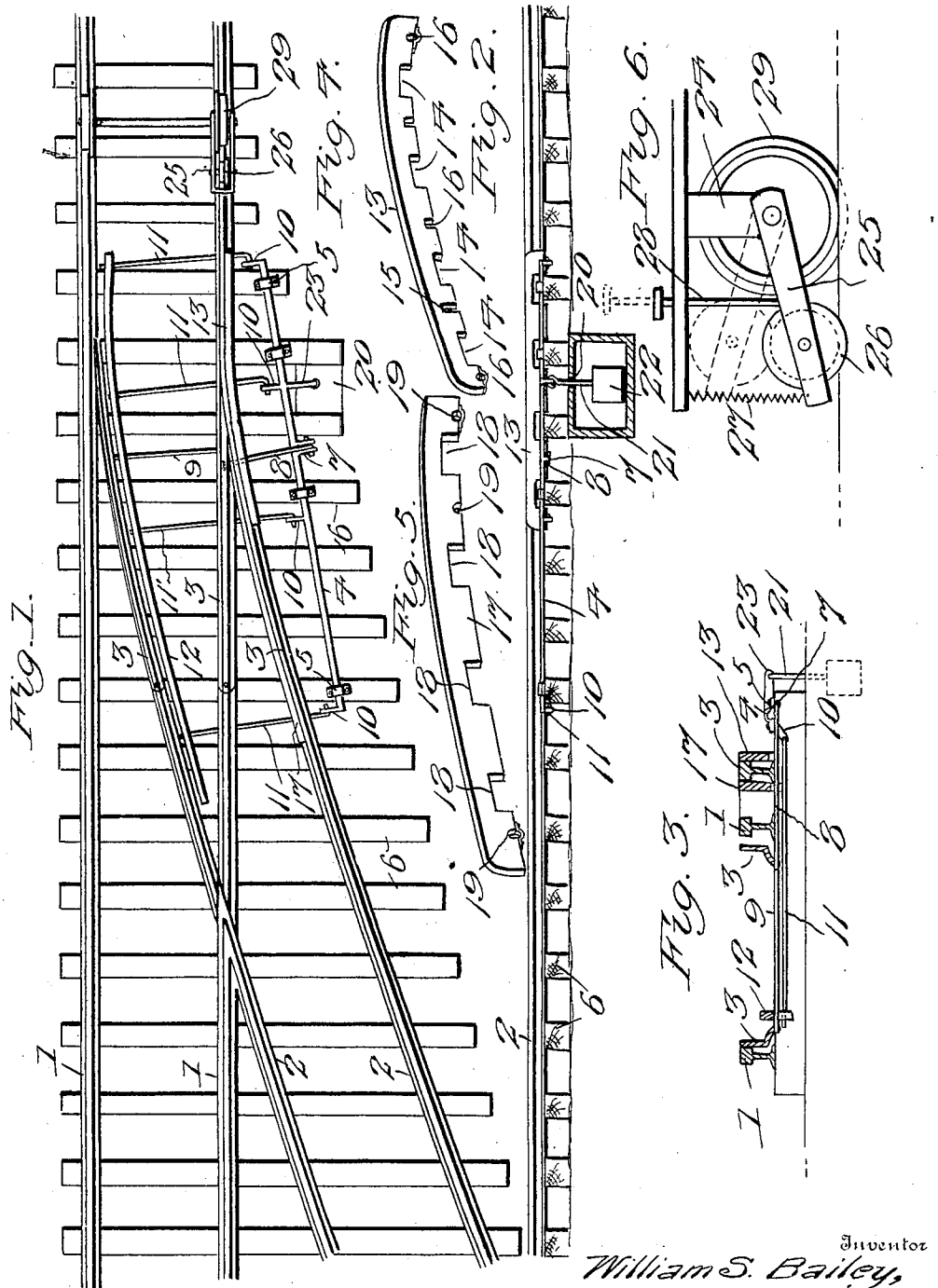

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SWITCH.

No. 813,936. Specification of Letters Patent. Patented Feb. 27, 1906.

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To all whom it may concern:

Be it known that I, WILLIAM S. BAILEY, a citizen of the United States, residing at Spring Hope, in the county of Nash and State of North Carolina, have invented new and useful Improvements in Switches, of which the following is a specification.

The invention relates to an improvement in switch and switch-operating mechanism wherein the construction provides for controlling the operation of the switch from the moving car.

The main object of the present invention is the provision of a switch and operating mechanism therefor adapted to automatically maintain the main line open and the siding closed.

Another object is the provision of means for automatically operating said switch by the first car or locomotive of the train, the operating mechanism being constructed to permit actuation by each succeeding car of the train to insure an open switch during the passage of the entire train.

Another object of the invention is the construction and arrangement of parts to permit ordinary surfacing, as in street-railroads, whereby to conceal all operating parts and prevent projecting obstruction above the surface of the street.

With these objects in view the invention consists in certain details of construction and combinations of parts, which will be described in the following specification, reference being had particularly to the accompanying drawings, wherein—

Figure 1 is a plan view illustrating my improved switch-operating mechanism therefor shown in conjunction with a main line and siding. Fig. 2 is a side elevation of the same, the weight-casing being shown in section. Fig. 3 is a transverse section showing the switch in open position. Fig. 4 is a perspective of the operating-plate. Fig. 5 is a perspective of the holding-plate. Fig. 6 is a broken side elevation, showing the forward end of the car structure, illustrating particularly one form of means for operating the switch mechanism.

Referring to the drawings, wherein like parts are indicated by similar reference-numerals throughout the several views, 1 represents the main-track rails, and 2 the siding-rails, 3 being the usual switch-points, which operate with the main-track rails in the usual manner.

My improved switch-operating mechanism comprises a rock-shaft 4, suitably mounted in bearings 5, fixed to the ties 6. The rock-shaft is preferably arranged in about parallel relation with the siding-tracks and is of a length to extend beyond the switch-points in each direction, as clearly shown in the drawings. About centrally of its length the rock-shaft is provided with an arm 7, extending in a direction away from the siding-rails, a rod 8 connecting said arm and the switch-point 3 immediately adjacent thereto. The switch-points are connected to each other by a rod 9 to insure uniformity of movement, as is usual, it being understood that as many of these connecting-rods 9 may be used as is necessary. At the ends and at a point intermediate the rock-shaft is provided with arms 10, normally projecting toward the track-rails and being terminally connected to one end of what I term "operating-rods" 11. These rods extend beneath the track-rails and switch-points, being slidably mounted at their opposite ends in a guide-bar 12, preferably arranged parallel to the siding-tracks and immediately adjacent that rail remote from the rock-shaft, as clearly shown in the drawings.

While I have shown and described but three of the operating-rods 11, it is evident that a greater or less number may be used as desired, the only requirement being that one of the arms 11 should be mounted for connection and operation by each end of the rock-shaft.

13 represents what I term the "operating-plate," being mounted for vertical movement. This plate extends lengthwise of the main track from a point beyond the connection of the latter and the siding to and beyond said connecting-point, the latter extension being alongside the siding-track. The plate, which is preferably a thin metallic structure, is formed with recesses 14 in its lower edge to register with the ties, whereby to permit vertical movement of the plate without contact with said ties. Adjacent the forward end the plate is also formed with an edge notch 15 to register with the tie-rod 8, this notch being of such depth that the plate will not contact with said tie-rod 8 during its reciprocal operating movement. The plate is also formed with notches 16, designed to register with the operating-rods 11, these notches being of a depth to permit contact between their upper walls and said operating-rods 11

in the normal position of the plates, so that on a depression of said operating-plate the walls of the notches 16 will contact with and depress the approximate ends of the rods 11, as will be evident.

17 represents the holding-plate, similar in construction to the operating-plate and arranged lengthwise that rail of the siding adjacent the rock-shaft. This plate is also arranged for vertical movement and formed with tie-receiving notches 18. The lower edge of the plate is formed with notches 19, designed to register with the operating-rods 11. These notches, as in the case of the notches 16 in the operating-plate, are of a depth to just receive the operating-rods in the normal position of the holding-plate and depress said rods upon a depressing operation of said holding-plate.

Immediately adjacent the rock-shaft and preferably in transverse alinement with the free ends of the switch-points a metallic casing 20 is arranged. The casing is closed on all sides and formed with an opening 21 in its upper wall to permit passage of a depending rod 21, carrying at its lower free end a suitable weight 22 and connected at its upper end to an arm 23, terminally secured to the rock-shaft preferably in transverse alinement with the free ends of the switch-points and projecting from said rock-shaft in a direction away from the adjacent track-rails. The weight 22 is sufficient to overbalance the switch-points, and thereby insure their movement in one direction under the influence of the weight.

In the structure described it will be noted that I have provided a rock-shaft mounted in suitable bearings and operated in one direction through the medium of the weight 22. The rock-shaft is connected, through the medium of fixed laterally-projecting arms and connected operating-rods, with the switch-points, the arrangement being such that the weights under normal conditions operate to maintain the rock-shaft in such position as to hold the switch-points normally open, thus providing for a continuously-open main track under normal condition. It will also be noted that the rear end of the holding-plate extends some distance beyond the forward end of the operating-plate, so that in transverse line these plates overlap to a considerable degree.

As a means for operating the switch mechanism described I provide hangers 24, depending from the forward end of a car or other vehicle, in the lower ends of which is mounted a roller-frame 25, rotatably supporting at its free end a flange-roller 26. This roller is positioned to ride upon the track-rail adjacent the rock-shaft when in operative position, the flange of the roller riding upon the outer face of the tread of the rail. A spring 27, connected to the car-body and to the frame 25, serves to normally return the frame and roller to normal elevated position, a foot-rod 28 projecting through the car-body and serving to depress said roller 26 into riding contact with the rail.

The operating-plate is positioned on the outer side of the main and siding rails, while the holding-plate is positioned on the inner side of said siding-rail, both the operating-plate and holding-plate overlying the operating-rods and being arranged to contact with and move said rods in a downward direction upon the depression of said plates, as will be evident.

In operation, the approaching car or train desiring to take the siding, the engineer or motorman will depress the wheel 26 into riding contact with the rail, whereby its flange will ride onto and depress the operating-plate 13. In the depression of this plate the operating-rods 11, which are contacted with in the depression of said plate, are moved downward, thereby rocking the shaft 4 in a direction to elevate the weight 22. This rocking of the shaft 4 elevates the arm 7 and moves the rods 8 to close the switch-points against the main track, thereby opening the siding. The switch-points will continue in this set position as long as the flange of the wheel 26 is riding upon the operating-plate, and I have arranged the respective positions of the operating and holding plates so that before the wheel 26 has ridden off the operating-plate the car-wheel 29, with its flange on the inner side of the rail, as usual, will ride above the holding-plate 17 and depress said plate to contact all its flanges therewith. As the depression of the holding-plate contacts with the operating-rods 11 and moves the rock-shaft exactly as in the movement of the operating-plate, it is evident that the wheels of the car-truck will maintain the switch to open the siding during the entire passage of the train, the holding-plate of course being of such length that the wheels of one truck are riding in contact with one end of said plate before the wheels of the preceding truck have left the opposite end. After the truck-wheels of the last car of the train have passed into the siding the pressure upon the holding-plate is relieved, and the weight 22 operates to return the switch-points to normal position, which is to open the main track.

It will be noted that operating-rods 11 are arranged immediately adjacent the ends of the respective operating and holding plates, whereby said plates, and thereby the switch-points, are operated immediately the respective wheels ride upon the said plate and continue in said position until the operating-wheels have wholly elevated the plate.

The number of operating-rods is immaterial, it being understood that they may be in any desired number and relation to the respective rails, it being understood, however, that they

are each so connected to the rock-shaft as to similarly operate said shaft upon their depression.

It will be noted that the entire operating mechanism described is located below the surface of the rails, whereby projecting obstruction is avoided, and thus providing in street-railways for the complete concreting or surfacing to the level of the rails, as is absolutely necessary in street-railway construction.

The improvement is readily adapted for street or steam railways, though in the latter I prefer to operate the wheel 26 by suitable lever mechanism of convenient formation and also provide a signaling device of ordinary type adapted to set desirable signals upon the operating of the switch, whereby to advise the engineer of the approaching train of the condition at the siding-terminal.

The operating-plate and holding-plate are of course to be slidably mounted with relation to the respective rails and may be connected thereto in any desirable way to permit the vertical movement.

The structure described is simple in operation, serving to automatically maintain the main track open at all times and to automatically move the switch-points to open the siding when desired and maintain said switch-point in such position during the entire passage of the train, automatically resetting the switch to open the main track immediately following the passage of the last car.

Having thus described the invention, what is claimed as new is—

1. The combination with the track-rails and the movable switch-points connected therewith, of a rock-shaft journaled adjacent the track and connected with said switch-points, operating-rods connected with said rock-shaft, and means to depress said rods to hold the switch in set position during the passage of the car thereon.

2. The combination with the track-rails and the movable switch-points connected therewith, of a rock-shaft journaled adjacent the track and connected with the switch-points, operating-rods connected with the rock-shaft, an operating-plate overlying said rods and adapted to depress said rods in operation, and a holding-plate overlying said rods and adapted to operate the rod in vertical movement.

3. The combination with the track-rails and movable switch-points connected therewith, a rock-shaft journaled adjacent the rails and connected with said points, means for operating the shaft in one direction, operating-rods connected with the shaft for its reverse operation, means for initially operating said rods, and means for holding said rod when operated, said latter means being controlled by the movement of the car.

4. The combination with a main track, a siding, and switch-points coöperating therewith, of a rock-shaft journaled adjacent the track-rails and connected with the switch-points, means connected with the rock-shaft for automatically holding said switch-points to open the main track, means operated by the advancing car to move said rock-shaft to open the siding, and means operated by the advancing car to hold said rock-shaft in operative position during the passage of the car onto the siding.

5. The combination with a main track, a siding, and switch-points coöperating therewith, of a rock-shaft journaled adjacent the track-rails and connected with the switch-points, means connected with the rock-shaft for automatically holding said switch-points to open the main track, means operated by the advancing car to move said rock-shaft to open the siding, and means operated by the advancing car to hold said rock-shaft in operative position during the passage of the car onto the siding, all of said parts being located below the tread of the rails.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM S. BAILEY.

Witnesses:
DAVID W. GOULD,
JOHN L. FLETCHER.