



No. 731,643.

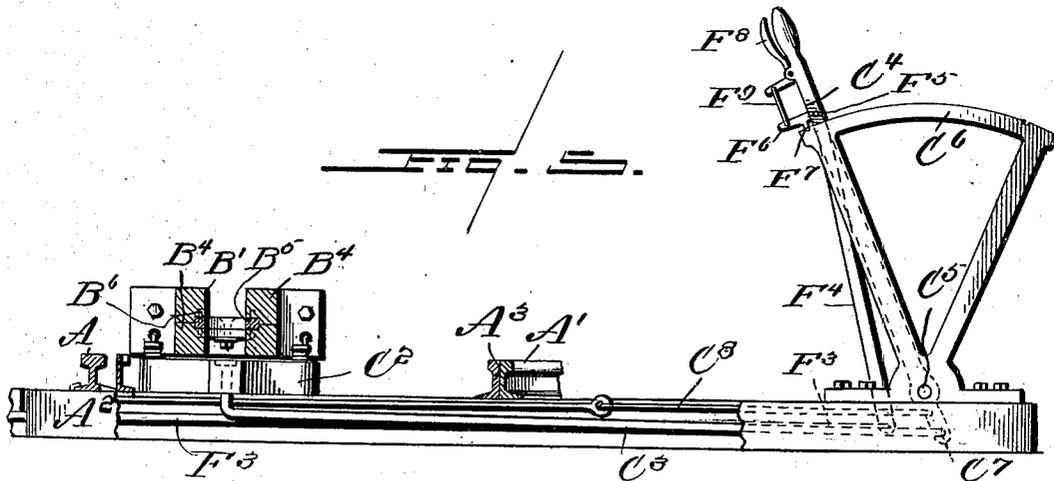
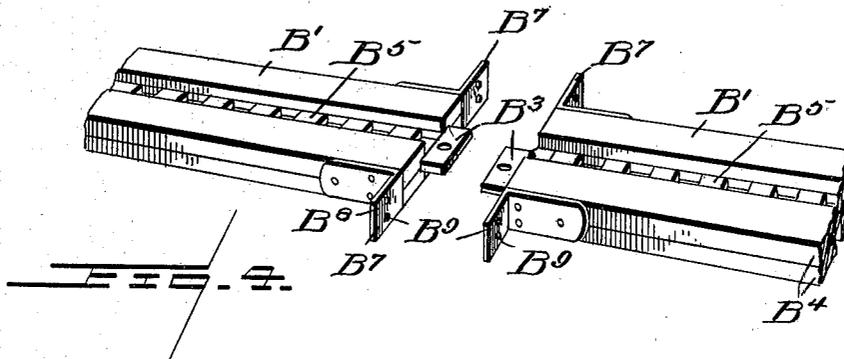
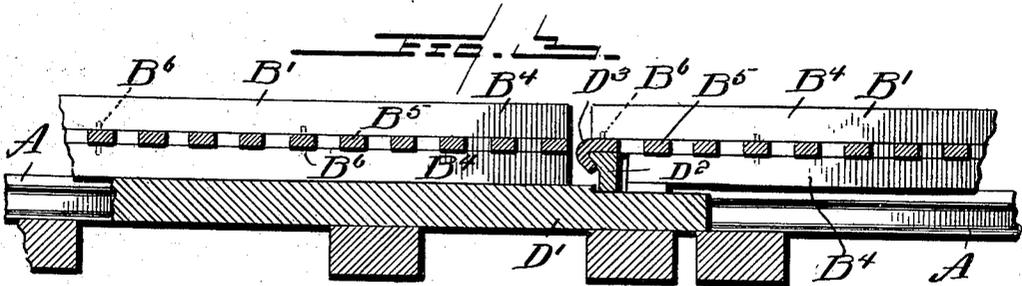
PATENTED JUNE 23, 1903.

HOWARD WILLIAMS & HENRY WILLIAMS.  
SWITCH FOR TRACTION RAILS.

APPLICATION FILED MAR. 25, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



WITNESSES:  
*Wm. F. Doyle*  
*Alfred T. Gage*

INVENTORS  
*Howard Williams, and*  
*Henry Williams,*  
BY *E. B. Stocking*  
Attorney

No. 731,643.

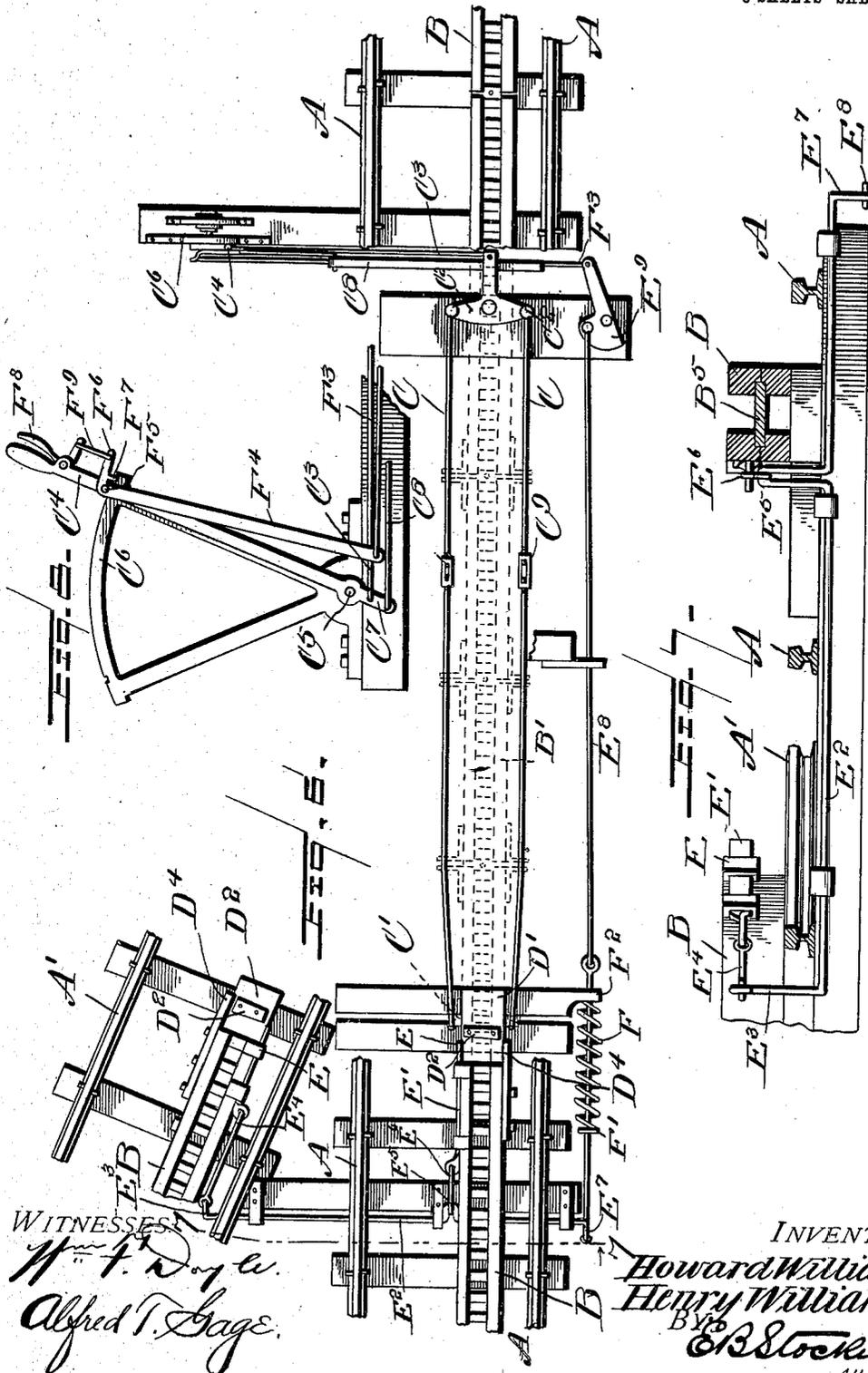
PATENTED JUNE 23, 1903.

HOWARD WILLIAMS & HENRY WILLIAMS.  
SWITCH FOR TRACTION RAILS.

APPLICATION FILED MAR. 25, 1903.

NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES  
*Wm. F. Doyle.*  
*Alfred T. Sage.*

INVENTORS  
*Howard Williams,*  
*Henry Williams,*  
 BY  
*E. B. Stocking*  
 Attorney

# UNITED STATES PATENT OFFICE.

HOWARD WILLIAMS AND HENRY WILLIAMS, OF MURPHYSBORO, ILLINOIS.

## SWITCH FOR TRACTION-RAILS.

SPECIFICATION forming part of Letters Patent No. 731,643, dated June 23, 1903.

Application filed March 25, 1903. Serial No. 149,540. (No model.)

*To all whom it may concern:*

Be it known that we, HOWARD WILLIAMS and HENRY WILLIAMS, citizens of the United States, residing at Murphysboro, in the county of Jackson, State of Illinois, have invented certain new and useful Improvements in Switches for Traction-Rails, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a switch for traction-rails, and is particularly adapted for use in connection with a movable traction-rail carrying means to be engaged by a driven member upon a carrier.

The invention has for its object to provide a novel construction of flexible traction-rail adapted to be shifted from one position to another by a switch-lever and simultaneously with the switching of the track-rails.

A further object of the invention is to provide an improved construction of jointed traction-rail, whereby the same is permitted to assume a straight or curved line coincident with the track-rails with which it cooperates.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings, Figure 1 is a plan of the switch; Fig. 2, a side elevation thereof; Fig. 3, a detail vertical section on the line 3 3 of Fig. 1; Fig. 4, a detail perspective of the adjoining ends of two of the sections of the track-rail; Fig. 5, a vertical section upon the line 5 5 of Fig. 1. Fig. 6 is a plan similar to Fig. 1, with the movable traction-rail removed; Fig. 7, a vertical section on the line 7 7 of Fig. 6, and Fig. 8 a detail elevation of switch-stand.

Like letters of reference refer to like parts in the several figures of the drawings.

The letter A designates track-rails of any desired construction and constituting the main line, as shown in Fig. 1, while A' A' indicate the rails of a switch-track approaching the main line upon a curved line, one of which rails is provided with a throw-point A<sup>2</sup>, and one of the rails A of the main line is provided with a similar point A<sup>3</sup>. The parts described merely constitute the ordinary construction of switch, and the traction-rail B has its fixed sections disposed between the track-rails, as shown. This traction-rail is also provided

with a movable portion comprising independent sections B', pivotally secured together by bolts B<sup>2</sup>, passing through lugs B<sup>3</sup>, carried at the meeting ends of the sections. This traction-rail may be of any desired character, so constructed as to be of sufficient flexibility to yield in the movement from one position to the other, and the present illustration merely discloses one form capable of this object. In this illustration the sections B' are composed of two parts B<sup>4</sup>, suitably secured together and carrying between the same a metallic plate B<sup>5</sup>, suitably apertured to constitute a rack for engagement with a driving gear or pinion carried by the motor-carriage. This rack-plate may be secured in position by means of pins or projections B<sup>6</sup>, extending in opposite directions therefrom into the timbers B<sup>4</sup> of the sections. Each of the sections B' is provided at their adjacent ends with contact-shoes B<sup>7</sup>, suitably secured thereto and provided with an upper aperture B<sup>8</sup> and a lower aperture B<sup>9</sup>. The upper set of these apertures is adapted to receive a bolt B<sup>10</sup>, by which the movement of the shoes in one direction is limited, while an operating-cable C passes through the lower apertures and is secured at the end of the movable section by a suitable bracket C'. This cable may be of any desired material, preferably of wire rope, and extends at opposite sides of the movable sections of the traction-rail parallel therewith and thence to a pivoted crank-arm C<sup>2</sup>, which is connected by a rod C<sup>3</sup> to a switch-lever C<sup>4</sup>, suitably pivoted at C<sup>5</sup> in a stand C<sup>6</sup>, which may be disposed upon either side of the track. From the extended end C<sup>7</sup> of the switch-lever a bar or rod C<sup>8</sup> extends to the throw-rails A<sup>2</sup> and A<sup>3</sup> for the purpose of operating the same simultaneously with the movement of the traction-rail. Each of the extended lengths of cable C may be provided with a suitable turnbuckle C<sup>9</sup> for adjusting the length thereof when found necessary.

The movable section of the traction-rail is adapted to be supported above the level of the track-rails so as to move over the same by any desired means—for instance, blocks D, suitably disposed between the track-rails in proper position to carry the weight of the movable section—while at the free ends of the main and switch tracks a supporting-block

D', behind which a hook D<sup>3</sup>, carried by the free end of the section, is adapted to engage, and thus hold the parts against longitudinal movement in both of their positions. For the purpose of stopping the movable section in proper alinement with the fixed traction-rails stops D<sup>4</sup> are likewise provided upon the fixed sections, against which the free end of the movable section abuts, and similar stops D<sup>5</sup>, Fig. 1, are provided upon the track-rail supports in order to bear against the movable section at different points, and thus insure a proper alinement and curvature throughout the length thereof.

For the purpose of retaining the movable section in position the traction-rails upon both the switch and main tracks are provided with latches E of similar construction. These latches may be of any desired form—for instance, a sliding bolt E', as herein shown, adapted to be operated by a crank-shaft E<sup>2</sup>, mounted in suitable bearings to extend beneath the rails, the arm E<sup>3</sup> at one end of said shaft being connected to the bolt upon the traction-rail of the switch-track by a rod E<sup>4</sup>, while a similar arm E<sup>5</sup> is provided with a link E<sup>6</sup> for connecting the bolt E' of the traction-rail upon the main track. The shaft E<sup>2</sup> is also provided with an arm E<sup>7</sup>, extending in an opposite direction to the arms E<sup>3</sup> and E<sup>5</sup>, to which an operating-rod E<sup>8</sup> is pivotally connected and extends to a crank-arm E<sup>9</sup>, pivoted at one side of the main track. For the purpose of normally throwing the latches this operating-rod is provided with a spring F, surrounding the same and bearing at one end upon a fixed projection F', carried by the rod, and at its opposite end against a support F<sup>2</sup>, through which the rod passes. For the purpose of operating the crank-arm E<sup>9</sup> a connecting-rod F<sup>3</sup> extends therefrom and is pivotally connected to the lower end of a lever F<sup>4</sup>, said lever being pivoted at its upper portion F<sup>5</sup> to the switch-lever C<sup>4</sup> and has extending from its pivot an angle-arm F<sup>6</sup>, carrying a latch F<sup>7</sup> to cooperate with the switch-stand, and above the pivot F<sup>5</sup> a bell-crank lever F<sup>8</sup> is pivoted to the switch-lever C<sup>4</sup> and connected with the arm F<sup>6</sup> by a link F<sup>9</sup>, so that when the latch F<sup>7</sup> is released from the switch-stand F<sup>6</sup> the track-latches will also be retracted against the tension of the spring F.

In the operation of the invention it will be seen that the movement of unlatching the switch-lever simultaneously releases the latches for the movable traction-rail, which may then be shifted by the movement of said lever, and as soon as the switch-lever is re-latched with its stand the tension-spring immediately causes the bolts of the rail-latches to contact with the rail and retain it in proper position. With the parts in the position shown in Fig. 1 it will be seen that a movement of the switch-lever will, through tension upon the cable C at the right of the movable section, move said section into alinement with the switch-track and simultaneously

shift the throw-points of the switch. During this movement the sections of the traction-rail are permitted sufficient oscillation to establish the curved line coincident with the switch-track rails, so as to insure a constant and complete contact with the traction-rail of the motor carried by the vehicle. The invention is adapted for use in any character of railway having a traction member adapted to be engaged by a rotative motive power upon a vehicle for the purpose of driving the same upon a grade, but is especially adapted for use in mines where the motive car is supplied with a gear or sprocket adapted to engage the rack carried by the movable section and where it is desirable to shift the motor from one entry to another, as these entries run at numerous angles from each other. It will be observed that a complete traction-rail is provided in either of its shifted positions and the necessity of a complicated construction of traction-rail connections from each of the tracks is avoided and the traction-rail shifted simultaneously with the switch.

It will be obvious that changes may be made in the details of construction and configuration without departing from the spirit of the invention as defined by the appended claims. Having described our invention and set forth its merits, what we claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, track-rails having movable switch-points, fixed traction-rails disposed between the track-rails, a movable section of traction-rail, and means for simultaneously moving said movable section with the switch-points.

2. In a device of the class described, track-rails having movable switch-points, fixed traction-rails disposed between the track-rails, a movable section of traction-rail, means for simultaneously moving said movable section with the switch-points, and stops to limit the movement of said movable section in each direction.

3. In a device of the class described, a track-rail, a fixed traction-rail disposed between the same, a switch-track, a movable portion of said traction-rail comprising independent sections pivoted together, and means for shifting said sections from one position to another.

4. In a device of the class described, a track-rail, a fixed traction-rail disposed between the same, a switch-track, a movable portion of said traction-rail comprising independent sections pivoted together, parallel cables extending from the free end of said movable portion, and a switch-lever for operating said cables.

5. In a device of the class described, a track-rail, a fixed traction-rail disposed between the same, a switch-track, a movable portion of said traction-rail comprising independent sections pivoted together, parallel cables extending from the free end of said movable portion, a switch-lever for operating said

cables, oppositely disposed shoes upon the meeting ends of said sections, and means for limiting the movement of said shoes away from each other.

5 6. In a device of the class described, a track-rail, a fixed traction-rail disposed between the same, a switch-track, a movable portion of said traction-rail comprising independent sections pivoted together, parallel cables extending from the free end of said movable  
10 portion, a switch-lever for operating said cables, oppositely-disposed shoes upon the meeting ends of said sections, a bolt connecting said shoes to permit a limited movement  
15 thereof, a fixed block beneath the free end of said movable portion, and a hook carried by said portion adapted to engage behind said fixed block.

20 7. In a device of the class described, a movable traction-rail comprising opposite timbers, an apertured metallic plate secured between the same, and projecting lugs at each end of said plate for pivotally securing adjacent plates together.

25 8. In a device of the class described, a movable traction-rail comprising opposite timbers, an apertured metallic plate secured between the same, projecting lugs at each end of said plate for pivotally securing adjacent  
30 plates together, and angular apertured shoes secured upon the opposite sides of adjacent ends of the sections of said traction-rail.

35 9. In a device of the class described, main and switch track rails, a movable switch-point for connecting the same, a fixed traction-rail between said track-rails, a movable portion of traction-rail, operating-cables upon opposite sides of said movable portion, a pivoted crank-lever having the cables from  
40 opposite sides of the movable portion connected at opposite sides of its pivot, a switch-lever connected to said arm, and a throw-bar extending from said switch-lever to the throw-rails.

45 10. In a device of the class described, main and switch track rails, fixed traction-rails disposed between the same, and a flexible movable section of traction-rail adapted to be shifted from a straight to a curved position.

50 11. In a device of the class described, track-rails having movable switch-points, fixed traction-rails disposed between the track-rails, a movable section of traction-rail, a latch upon the track-rails for retaining the  
55 traction-rail in position, means for primarily releasing said latch, and means for simultaneously moving said traction-rail and switch-points.

60 12. In a device of the class described, track-rails, fixed traction-rails disposed between the same, a movable section of traction-rail,

latches carried by the fixed traction-rails to engage said movable section, a spring for normally retaining said latches in a locked position, and an operating-rod for shifting  
65 said latches.

13. In a device of the class described, track-rails, fixed traction-rails disposed between the same, a movable section of traction-rail, latches carried by the fixed traction-rails to  
70 engage said movable section, a spring for normally retaining said latches in a locked position, an operating-rod for shifting said latches, a switch-lever connected to operate  
75 said movable section, a latch upon said switch-lever adapted to engage the stand thereof, and a connection between said operating-rod and switch-latch for shifting the former preliminarily to the movement of the switch-lever.  
80

14. In a device of the class described, track-rails, fixed traction-rails disposed between the same, a movable section of traction-rail, latches upon the fixed traction-rails consisting of sliding bolts adapted to engage the  
85 movable section, a crank-shaft having arms connected to said latches and an arm extending in the opposite direction to the latch-arms, an operating-rod, a tension-spring for normally forcing said rod in one direction, a  
90 crank-arm for shifting said rod in the opposite direction, and means for operating said crank-arm.

15. In a device of the class described, track-rails, fixed traction-rails disposed between  
95 the same, a movable section of traction-rail, latches upon the fixed traction-rails consisting of sliding bolts adapted to engage the movable section, a crank-shaft having arms connected to said latches and an arm extending  
100 in the opposite direction to the latch-arms, an operating-rod, a tension-spring for normally forcing said rod in one direction, a crank-arm for shifting said rod in the opposite direction, a crank-arm for oscillating the  
105 movable section, a switch lever and stand, a connection between said lever and the crank-arm for the movable section, a lever pivoted upon said switch and provided with an angularly-disposed arm, a switch-latch upon said  
110 arm, a bell-crank lever pivoted to said switch-lever and connected to said arm, and a connection extending from the lever pivoted upon the switch-lever to the crank-arm for operating the rail-latches.  
115

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

HOWARD WILLIAMS.  
HENRY WILLIAMS.

Witnesses:

ALEXANDER ROBERTSON,  
IRA ANDERSON.