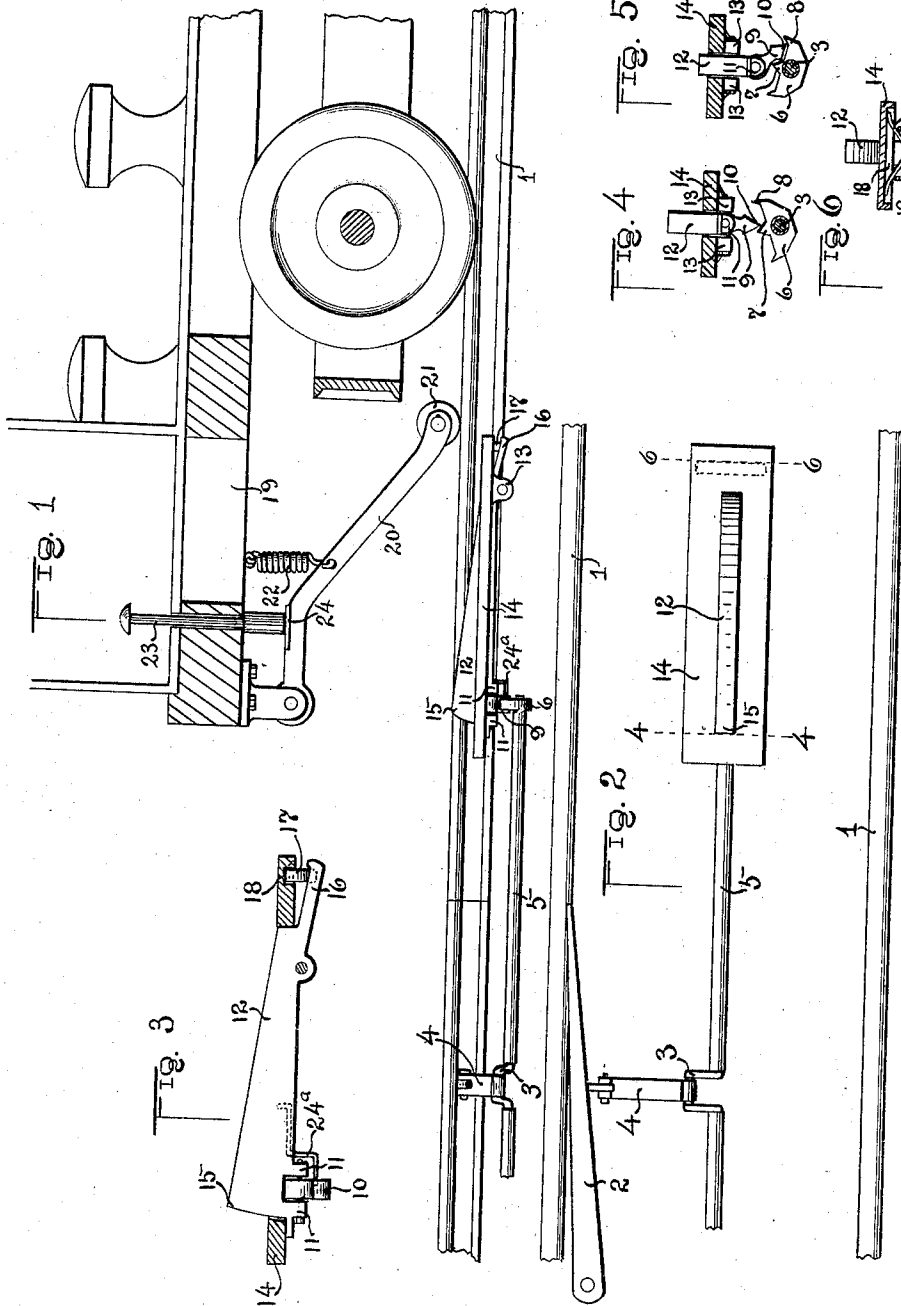


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2 SHEETS—SHEET 1.



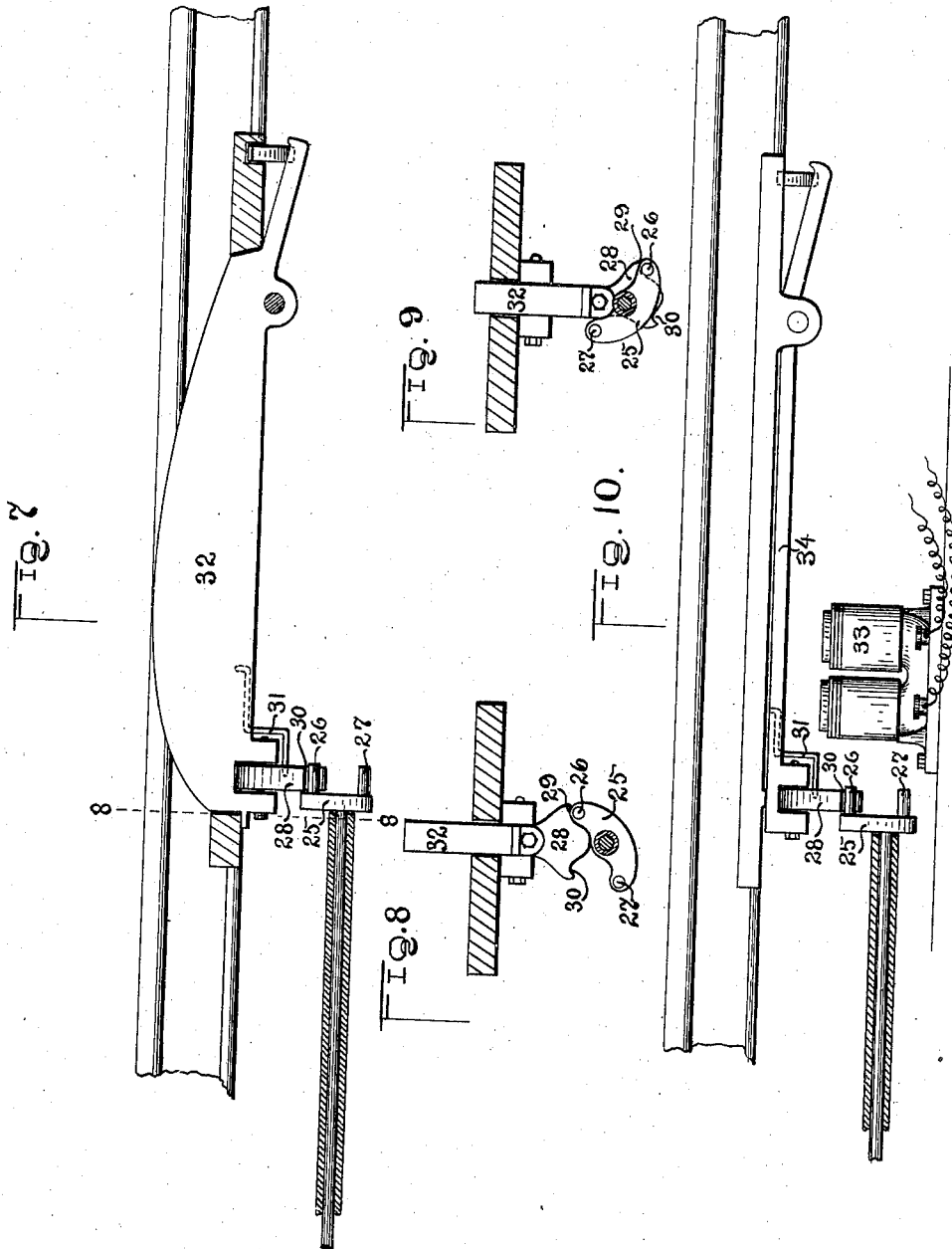
Witnesses  
 Gilbert H. Greene,  
 M. H. Newcomb,

Inventor  
 Aaron B. Allen.  
 By  
 W. J. FitzGerald & Co.  
 Attorneys

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# UNITED STATES PATENT OFFICE.

AARON BURR ALLEN, OF PUEBLO, COLORADO, ASSIGNOR TO THE ALLEN SWITCH COMPANY, OF PUEBLO, COLORADO, A CORPORATION OF COLORADO.

## SWITCH-OPERATING MECHANISM.

980,473.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed March 2, 1910. Serial No. 546,911.

*To all whom it may concern:*

Be it known that I, AARON B. ALLEN, a citizen of the United States, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented certain new and useful Improvements in Switch-Operating Mechanism; and I 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.

My invention relates to new and useful improvements in switch operating mechanism and my object is to provide a crank shaft for connecting the same to the switch point, whereby when the shaft is rotated the point will be swung on its pivot.

A further object is to provide a head at the opposite end of the crank shaft, whereby when pressure is applied on said head the crank shaft will be rotated.

A further object is to provide a plunger to engage and operate said head.

A further object is to provide means for carrying and operating said plunger, and,

A further object is to provide means for restoring said plunger and parts carrying the same to their initial positions.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the accompanying drawings which are made a part of this application, Figure 1 is an elevation of a portion of a track way and car positioned thereon, the car being shown in section. Fig. 2 is a top plan view of the track way and switch operating mechanism. Fig. 3 is a side elevation of the plunger and parts carrying the same, the supporting plate therefor being shown in section. Fig. 4 is a sectional view as seen on line 4—4 Fig. 2 showing the parts of the switch operating mechanism in position to be operated. Fig. 5 is a similar view showing the mechanism in its operative position. Fig. 6 is a sectional view as seen on line 6—6. Fig. 7 is a detail sectional view of a slightly modified form of operating mechanism. Fig. 8 is a sectional view as seen on line 8—8 Fig. 7 showing the operating mechanism in its initial position. Fig. 9 is a similar view showing the parts in their operative position, and, Fig. 10 is an elevation partly in section of a still different form of operating mechanism.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the track rails which may be constructed in the usual or any preferred manner and 2 indicates the usual form of switch point, one end of which is pivoted, while the opposite end thereof is substantially wedge shaped and adapted to be thrown into or out of engagement with one of the rails. In order to move said switch point into or out of engagement with the rail, a crank shaft 3 is provided to the crank portion of which is attached a link 4, the opposite end of the link being pivotally attached to the switch point, so that when the crank shaft 3 is rocked, the switch point will be swung back and forth on its pivot.

The crank 3 is introduced into any suitable form of bearing such as pipe sections 5, one end of the shaft having fixed thereto a head 6. The upper edge of the head 6 is provided at its center with a substantially V shaped projection 7, while the ends thereof are also provided with projections 8, the inner edges of which are inclined.

The head 6 is employed for rocking the crank shaft 3 and to readily accomplish this result, a plunger 9 is positioned above the center of the head 6 and immediately in alinement with the axis of the shaft 3, the lower end of the plunger having a substantially diamond shaped point 10 which co-operates with the projections on the head to cause the same to rotate the shaft when the plunger is lowered.

The upper end of the plunger 9 is pivotally mounted between ears 11 on the under side of a bar 12, one end of the bar being pivotally mounted between ears 13 on a plate 14, said plate being mounted in any suitable manner in the road bed between the track rails.

The upper edge of the bar 12 is inclined upwardly from its pivotal to its forward end, the wider portion 15 of the bar normally extending a distance above the plate 14.

The pivoted end of the bar is provided with an arm 16 which engages the bowed portion of a spring 17, the ends of the spring entering a seat 18 in the plate 14, the tension of the spring being sufficient to normally hold the bar 12 in an elevated position.

The bar 12 is operated to lower the plunger 9 by pivotally attaching to the car body 19 a lever 20, the upper end of the lever being pivotally attached to the car body, while the lower end thereof is provided with a wheel 21 which is adapted to engage the inclined face of the bar 12 and force the free end of the bar downwardly. The lever 20 is normally held suspended above the bar 12 by means of a spring 22 and downward pressure is applied to said lever through the medium of a bolt or pin 23 which projects through the floor of the car, the lower end of the bolt engaging the horizontal portion 24 of the lever and it will be readily seen that when downward pressure is applied to the bolt, the lever 20 will be likewise lowered.

When the bar 12 is depressed, the point 10 moves into engagement with the projection 7 and engages one of the slanting faces thereof, so that by further depressing the bar 12, the plunger will be swung outwardly and into engagement with one of the projections at the end of the head, which will result in lowering that end of the head and rotating the crank shaft 3 to which the head is attached.

The head 6 is so arranged that when turned its full distance in either direction, the upper edge thereof will rest at an angle, thus disposing the apex of the projection 7 at one side of the path of the plunger 9 so that said plunger will always be directed to the right or left when the bar 12 is lowered. The plunger 9 is normally retained in proper alignment below the bar 12 by means of a spring 24<sup>a</sup>, one end of which is fixed to the plunger 9 adjacent the point end thereof, while the opposite end of said spring is extended upwardly into engagement with the bar 12 so that when said plunger is swung to the right or left, it will be immediately returned to its initial position, when the plunger is released from engagement with the head.

Instead of using that form of head and plunger as shown in Figs. 1 to 6, that form of head and plunger in Figs. 8 to 10 may be used. The head 25, in this instance, having adjacent its ends laterally extending pins 26 and 27 with which the plunger 28 is adapted to engage, the lower face of the plunger, in this instance, having curved depressions 29 and 30 which are adapted to engage the pins 26 and 27 respectively when the plunger is lowered. When this form of device is used, engagement of the pins with either of the depressions, will swing the plunger laterally, as in the former instance, the spring 31 being employed for returning the plunger to its initial position. I have also shown the upper face of the bar 32, in this instance, as upwardly curved instead of gradually inclined as in the former.

Instead of employing a lever in connection

with the car body to operate the switch point, a magnet 33 may be positioned below the bar 34, in which instance, the bar serves as an armature and in this instance, the plate above the bar is solid instead of being provided with a slot to receive the bar. In this form of device, it will be readily seen that when the magnets are electrically energized, which may be accomplished in any suitable manner, the bar will be lowered by attraction instead of by pressure.

It will thus be seen that I have provided a reliable and economical form of means for operating a switch point and one that can be readily controlled from the car body and it will likewise be seen that said operating mechanism will be positive in its action and in view of the simplicity of the device, can be installed at a minimum expense.

What I claim is:—

1. In a switch operating mechanism, the combination with a pivoted switch point, a crank shaft and connecting means between said switch point and crank shaft; of a plate secured to the road-bed, said plate having an elongated slot therein, a bar inserted within said slot and pivoted adjacent one end to the under face of said plate, a plunger pivotally secured to the opposite end of said bar adapted to swing laterally in either direction, a head mounted on the end of said crank shaft having extensions thereon adapted to be engaged alternately by said plunger to rock the head in opposite directions when said bar is lowered, and spring means to retain said bar normally in raised position.

2. In a switch operating mechanism, the combination with a pivoted switch point, a crank shaft and connecting means between said switch point and crank shaft; of a plate secured to the road-bed, said plate having an elongated slot therein, a bar inserted within said slot and pivoted adjacent one end to the under face of said plate, a plunger pivotally secured to the opposite end of said bar, a horizontal spring having one end in engagement with said plunger and the opposite end secured to said bar to normally retain said plunger in vertical position, a head mounted on the end of said crank shaft having a central extension thereon and also extensions at the ends thereof for cooperation with said plunger, said head being adapted to be moved by the plunger when said bar is lowered, and spring means to normally retain said bar in raised position.

3. In a switch operating mechanism, the combination with a pivoted switch point, a crank shaft and connecting means between said switch point and crank shaft; of a plate secured to the road-bed having an elongated slot therein, said plate being provided with a pair of ears on the under face and adjacent one end thereof, a bar inserted within

said slot and pivoted adjacent one end between said ears, a spring-retained plunger pivotally mounted to the opposite end of said bar, a head mounted on the end of said crank shaft adapted to cooperate with said plunger, said head and corresponding crank shaft being moved when said bar and plunger are lowered, and spring means to normally retain said bar in raised position.

10 4. In a switch operating mechanism, the combination with a pivoted switch point, a crank shaft and connecting means between said switch point and crank shaft; of a plate secured to the road-bed having an elongated slot therein, said plate being provided with a pair of ears on the under face and adjacent one end thereof, a bar inserted within said slot and pivoted adjacent one end between said ears, said bar being also provided at the opposite end thereof with a pair of downwardly facing ears, a plunger pivotally mounted therebetween, a horizontal spring having one end bent into engagement with said plunger and the opposite end thereof secured to said bar to retain said plunger normally in vertical position, a head mounted on the end of said crank shaft adapted to be engaged and moved by the plunger when said bar is lowered, and spring means to normally retain said bar in its raised position.

5. In a switch operating mechanism, the combination with a pivoted switch point, a crank shaft and connecting means between said switch point and crank shaft; of a plate secured to the road-bed, said plate having an elongated slot therein and provided with a seat in the rear end thereof, a bar inserted within said slot and pivoted adjacent one end to the under face of said plate, a plunger

pivotally secured to the opposite end of said bar, a head mounted on the end of said crank shaft adapted for cooperation with said plunger when said bar is lowered, and a bow spring mounted in the seat of said plate, said bar being provided with an extension beyond its pivotal point and in engagement with said bow spring, whereby said bar is normally retained in its raised position.

6. In a switch operating mechanism, the combination with a pivoted switch point, a crank shaft and connecting means between said switch point and crank shaft; of a plate secured to the road-bed having an elongated slot therein, a bar inserted within said slot and pivoted adjacent one end to the under face of said plate, a plunger pivotally mounted to the under face of the opposite end of said bar, said plunger having the lower end thereof formed substantially V-shaped, spring means to normally retain said plunger in vertical position, a head mounted on the end of said crank shaft below said plunger, said head being provided with a central V-shaped extension to cooperate with said plunger, and extensions also provided at the ends of said head, said head being adapted to be moved by said plunger when said bar is lowered, and spring means to normally retain said bar in its raised position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AARON BURR ALLEN.

Witnesses:

J. M. BARNES,  
ISAAC BUTZ.