

(No Model.)

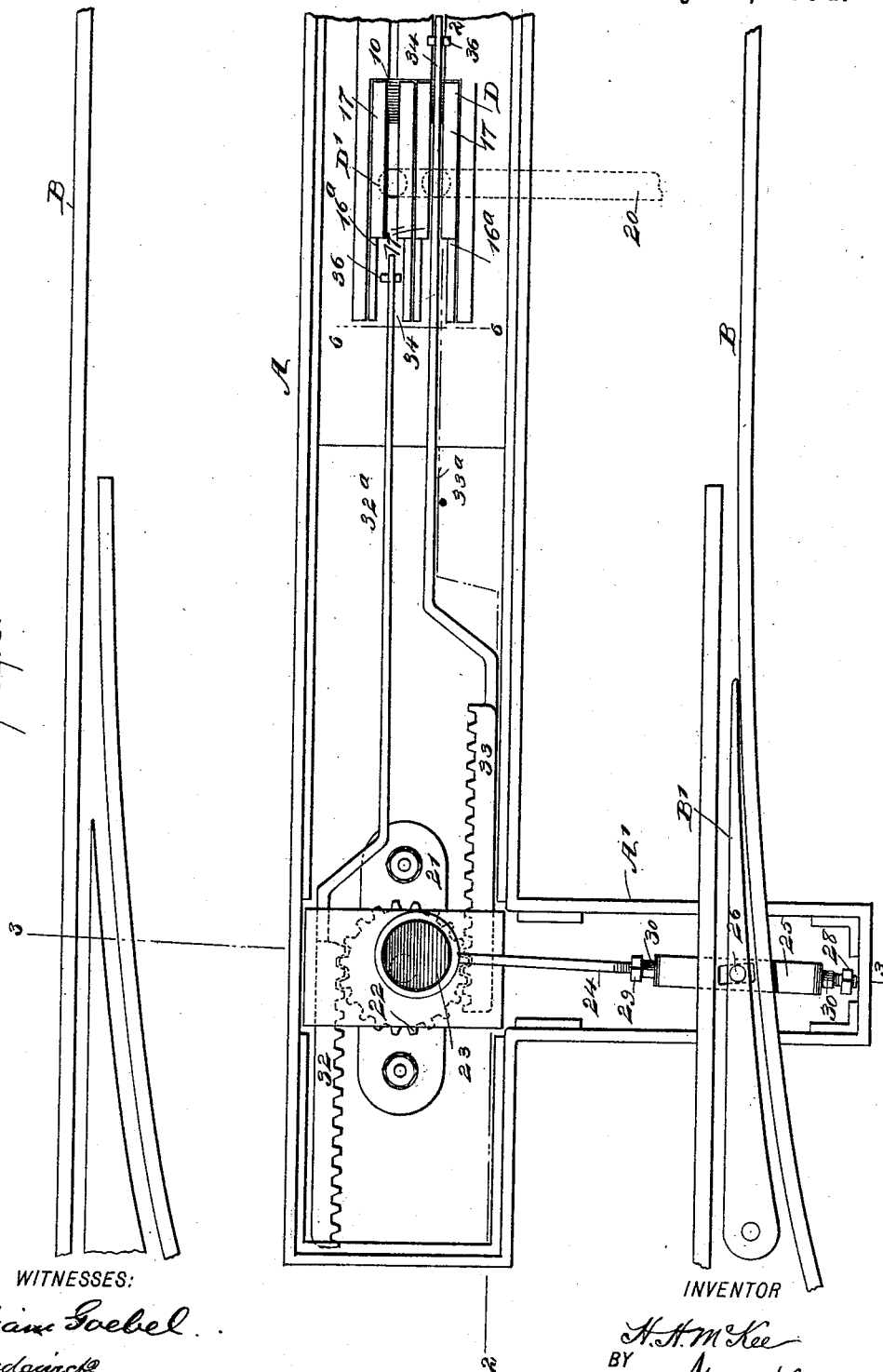
2 Sheets—Sheet 1.

H. H. McKEE.
SWITCH OPERATING DEVICE.

No. 523,543.

Patented July 24, 1894.

Fig. 1.



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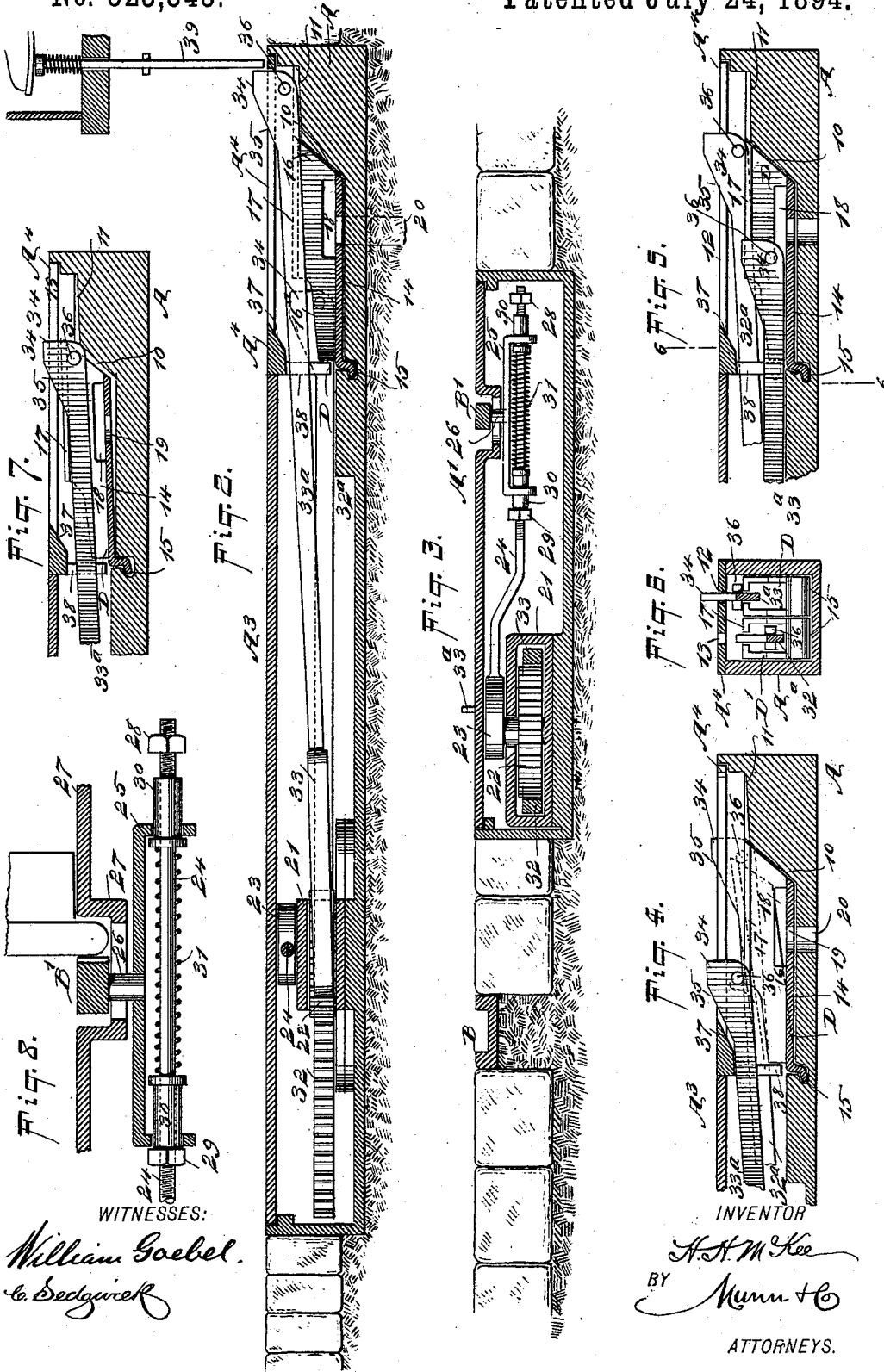
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

HARRY H. MCKEE, OF BROOKLYN, NEW YORK.

SWITCH-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 523,543, dated July 24, 1894.

Application filed February 28, 1894. Serial No. 501,833. (No model.)

To all whom it may concern:

Be it known that I, HARRY H. MCKEE, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Switch-Operating Device, of which the following is a full, clear, and exact description.

My invention relates to an improvement in switch operating devices especially adapted for use in connection with tram ways or cars of any description, and the object of this invention is to improve upon the construction of the switch operating device filed by me October 10, 1893, Serial No. 487,711, and allowed January 17, 1894, the improvement being such as to render the operation of the device more positive than the construction described in the aforesaid application, and to simplify the construction of the device generally.

A further object of the invention is to so locate the operating arms of the device, or that portion which must appear at the surface of the road bed, that the said portions will be adequately protected, and the boxing need not necessarily rise to any extent above the level of the bed.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the switch operating mechanism. Fig. 2 is a longitudinal section taken practically on the line 2—2 of Fig. 1. Fig. 3 is a transverse section taken essentially on the line 3—3 of Fig. 1. Fig. 4 is a longitudinal section through the guide ways for the shifting arms of the device, illustrating said arms one in position to drop and the other being elevated to be brought into action. Fig. 5 is a similar section, in which the shifting arms are shown, the upper one as being acted upon to shift the switch, and the other arm as being carried automatically to the position vacated by the upper arm. Fig. 6 is a transverse section through the guide ways or boxings of the

shifting arms, taken practically on the lines 6—6 of Figs. 1 and 5. Fig. 7 is a similar view to Figs. 4 and 5, in which one of the shifting arms is illustrated as just passing to a position to be operated upon; and Fig. 8 is a longitudinal section through the mechanism connected directly with the switch, illustrating the manner in which the switch may be moved to one side by the flange of a passing wheel without detriment to the shifting mechanism or bringing said mechanism into action.

In carrying out the invention a box or casing A, is located between the rails B of the track, preferably about centrally between said rails, and the said box or casing is provided with a branch A', which extends transversely between the rails and across the under surface of the switch B'. The box or casing is sunken to such an extent that its cover A³ will be practically flush with the road bed, as illustrated in Fig. 2.

At one end of the main body or trunk of the box A, a rear inclined wall 10, is formed, and a flat surface 11, is produced below the upper line of the box, extending from the upper portion of the inclined wall rearward. The main cover A³ of the box is made to terminate a predetermined distance from the end of the box provided with the said inclined wall 10, and this portion of the box is provided with an auxiliary cover A⁴, and said cover is preferably provided with two longitudinal parallel slots 12 and 13.

Two box-like guide ways D and D', are located in the bottom portion of the main box or casing A, and the outer ends of these box-like guide ways are inclined to rest upon, or to slide upon the inclined wall 10 of the main box. Each of these box guide ways preferably consists of a bottom 14, which at its inner end is usually provided with a downwardly extending flange 15, through the medium of which the forward end of the box guide way is pivotally attached to the main box A, and opposing side pieces 16, are projected upward from the bottom 14; and as heretofore stated, the entire rear portion of each box guide way is inclined to meet the inclined wall 10 of the main box. Each side piece 16, at a point between its center and the inner end, is reduced in width, and the reduced portion of the side pieces may be

connected with the upper edge of the wider portion, either by a straight, or an inclined or curved wall, the reduced section of the side pieces being designated as 16^a in the drawings.

An inwardly extending flange 17, is formed upon the upper edge of the wider portion of each side piece, the said flanges extending from the back to the point where the reduction in width occurs; furthermore, each side piece is also preferably provided with an opening 18 in its lower edge, said opening being brought over openings 19 in the bottom of the box guide ways, communicating with pipes 20, leading to a sewer or other point of discharge, the pipes being adapted to carry off any water or other liquid that may collect in that portion of the main box or casing A.

Near the opposite end of the main box or casing A, an auxiliary boxing 21, is usually located, in which a pinion 22, is pivoted, and an eccentric 23, is secured to the upper trunnion of the said pinion, the eccentric being preferably located above the boxing, as shown in Figs. 2 and 3.

The eccentric is connected by a rod 24 with the switch B', and the connection is preferably effected as shown in Figs. 3 and 8, in which it will be observed that a yoke 25, is connected by a stud 26 with the bottom of the switch point, the said stud being held to slide in a slot produced in a shoe 27, on the platform upon which the switch point has movement. The yoke is shaped practically as an inverted U, and its members are provided with openings through which the outer ends of the eccentric rod 24 are passed, and the said rod is provided at its extreme outer end with a thread adapted to receive a nut 28, and at a point outside of the inner end of the yoke the rod is provided with another threaded surface receiving a second nut 29.

A sleeve 30 is loosely mounted upon the rod adjacent to the inner face of each nut, the sleeves being provided with flanges upon their inner ends, and a spring 31 is coiled around the rod, the inner ends of the sleeves having bearing against the ends of the spring, as is best shown in Fig. 8. A portion of these sleeves is adapted to be constantly located within the openings in the yoke through which the eccentric rod passes. Thus, in the event the switch point has been thrown to the right for example, and a train should approach from the siding, as shown in Fig. 8, when the flange of the wheel enters the space between the switch point and rail, the switch point may be forced inward to make room for the flange without detriment to or action upon the shifting mechanism, since the yoke will move to the left upon the sleeves 30 and will contract the spring 31, having no action whatever upon the eccentric rod; and when the switch is freed from the wheel flange the spring 31 will restore it to its normal position. When the switch point is shifted by

the shifting mechanism, either the nut 28 or the nut 29, according to the direction in which the rod 24 is manipulated, will have bearing against one end of the yoke after compressing the spring 31, and will move the switch point through the yoke to the position desired.

The eccentric rod is manipulated through the medium of two racks 32 and 33, engaging with the pinion 22, and having sliding movement in the housing 21. The shifting mechanism is connected with each rack by two arms one of which arms is designated as 32^a and the other as 33^a, and these shifting arms extend to the box guide ways D and D' and enter the same. The outer end of each shifting arm is provided with a head 34, which head is provided with an inclined surface 35 upon its upper inner surface and with a pin 36, extending through it and beyond both sides, located at the lower portion of its outer end. The inclined surfaces 35 of the heads of the shifting arms are adapted for engagement with corresponding surfaces 37 formed upon the under surface of cover A³ at the inner end thereof, and it may here be remarked that a spacing bar 38, is projected downward from this portion of the auxiliary cover, and is located in front of the inner ends of the opposing inner side walls or pieces of the box guide ways.

The head of one of the shifting arms will be constantly above the level of the top of the auxiliary cover A⁴, projecting upward through one of the slots 12 or 13; and the switch is manipulated by the projecting portion of the uppermost head being struck by a depressed rod or shoe 39, or the equivalent thereof, projected downward, for example, from the platform of the car, as shown in Fig. 7.

Supposing the shifting arms to be in the position shown in Fig. 2, in which it will be observed that the head of the arm 33^a rests upon the upper flat surface 11 at the extreme end of the main casing or box, and the head of the opposite shifting arm 32^a is down within its box guide way out of sight, the switch will now be in the position shown in Fig. 1; if the car approaching the switch desires to keep the straight track, the trip mechanism will not be lowered, but should it desire to take the siding the trip mechanism will be lowered as shown in Fig. 2, and will strike the exposed head of the shifting arm 33^a, and will carry the said head and likewise the arm forward with it, thereby causing the rack 32 to act upon the pinion 22 in a manner to operate the eccentric and its rod 24 to open the switch, while at the same time the pinion will act upon the opposite rack 33 in a manner to force the rack from it and cause the head portion of the opposing shifting arm 32^a to travel between the end of the main boxing at a speed proportionate to that of the opposite arm in leaving said end; thus as one arm recedes, or is withdrawn the other one is proportionately advanced. When the receding arm, or that

operated by the trip 39 reaches the unflanged and narrow portion of its box guide way it will drop to the bottom thereof, its pin 36 leaving the flange 17 upon which it had traveled.

In Fig. 5 the head of one shifting arm is leaving the end of the box while the other is approaching it, and at about the time that the receding head drops to the bottom of its guide way the pin of the opposite head will have engaged with the under surface of the flange of its guide-way, and will have lifted up that box guide way, as shown in Fig. 7, whereupon the pin may enter upon the upper surface 11, and the box guide way may then drop to place. At this time the shifting arms will be in exactly the reverse position to that shown in Fig. 2.

The inclined surface 37 of the auxiliary top or cover A⁴, when engaged by the corresponding surface 35 of the head of the shifting arm will insure the said arm falling to the bottom of its guide way.

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

1. In a switch operating device, an eccentric, a rod having limited yielding connection with the switch to be operated, shifting arms each of which acts to revolve the eccentric, said shifting arms terminating in heads, guide-ways adapted to receive the heads of the shifting arms, and means, substantially as described, for holding the head of one shifting arm at a greater elevation than the other and in position to be engaged above the road bed, as and for the purpose specified.

2. In a switch operating device, the combination, with a switch, an eccentric, and a connection between the eccentric and the switch point, substantially as described, of shifting arms, each adapted to rotate the eccentric and move simultaneously in opposite directions, each arm terminating in a head having side projections, a box guide way fitted to receive the head of each arm, having an inclined rear wall meeting a substantially horizontal surface at the top, the upper portion of the side walls of the guide ways being adapted to receive the projections on the head of the shifting arms for a given extent of their length, and means, substantially as described, for causing the said heads to drop at one end of the supporting surface of the said guide way walls, as and for the purpose specified.

3. In a switch operating device, the combination, with a switch point, an eccentric, and a connection, substantially as shown and described, between the eccentric and the switch point, of shifting arms operating the eccentric, moving simultaneously in opposite directions, each of said arms terminating in a head provided with projections from opposite sides, and guide-ways pivoted at their for-

ward ends to a fixed support adapted to receive the heads of the shifting arms, the free ends of the guide ways resting upon inclined planes, said guide ways being lifted at their free ends by an advancing head and being provided with means for releasing the head of a receding shifting arm, permitting it to drop substantially to the bottom of the said guide way, as and for the purpose specified.

4. In a switch operating device, the combination, with a switch point, an eccentric, a connection, substantially as shown and described, between the eccentric and the switch point, a pinion connected with the eccentric, and shifting arms provided with racks at their inner ends engaging with opposite surfaces of the pinion and adapted to move simultaneously in opposite directions, each shifting arm being provided with a head, of guide-ways pivoted in the fixed support at one end, each being adapted to receive the head of a shifting arm, the said guide ways resting upon inclined planes at their free ends, projections located on the heads, adapted to elevate the free end of a guide way when said head is advanced up the inclined plane, and a means, substantially as shown and described, for releasing the head from support upon the upper portion of the guide way, when a predetermined point has been reached near the pivoted end, as and for the purpose specified.

5. In a switch operating device, the combination, with a switch point, a yoke connected therewith, an eccentric, a rod projected from the eccentric through apertures in the yoke and provided with stops adjacent to the outer surfaces of the yoke, flanged sleeves loosely mounted upon the said rod and passed through the said apertures in the yoke, and a spring located between and adapted to be compressed by said sleeves, a pinion connected with said eccentric, and shifting arms provided with a rack at one end engaging with the pinion, the arms being adapted to move simultaneously in opposite directions, said arms being provided at their opposite ends with heads, of guide-ways pivoted in a fixed support at one end, and each adapted to receive a head of a shifting arm, the said guide ways resting upon inclined planes at their free ends, projections located on the heads, adapted to elevate the free end of a guide-way when said head is advancing up the inclined plane, and a means, substantially as shown and described, for releasing the head from support upon the upper portion of the guide way, when a predetermined point has been reached near the pivoted end, as and for the purpose specified.

HARRY H. MCKEE.

Witnesses:

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WILLIAM FIRTH.