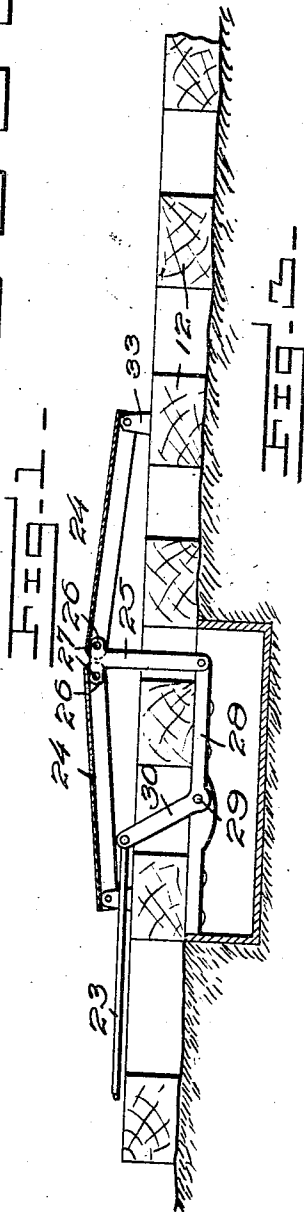
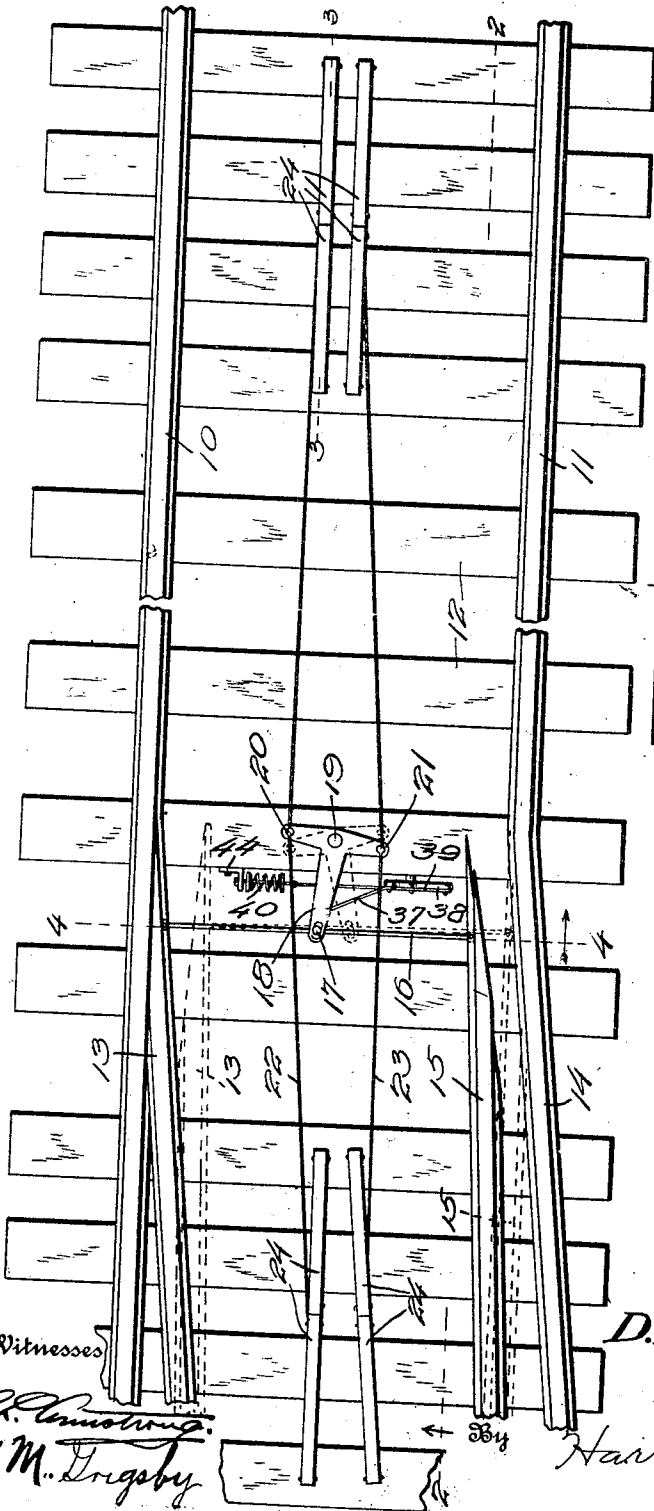


D. F. HOFFMANN.
 AUTOMATIC RAILWAY SWITCH OPERATING MECHANISM.
 APPLICATION FILED NOV. 8, 1910.

999,999.

Patented Aug. 8, 1911.

4 SHEETS—SHEET 1.



Witnesses

A. M. Crosby
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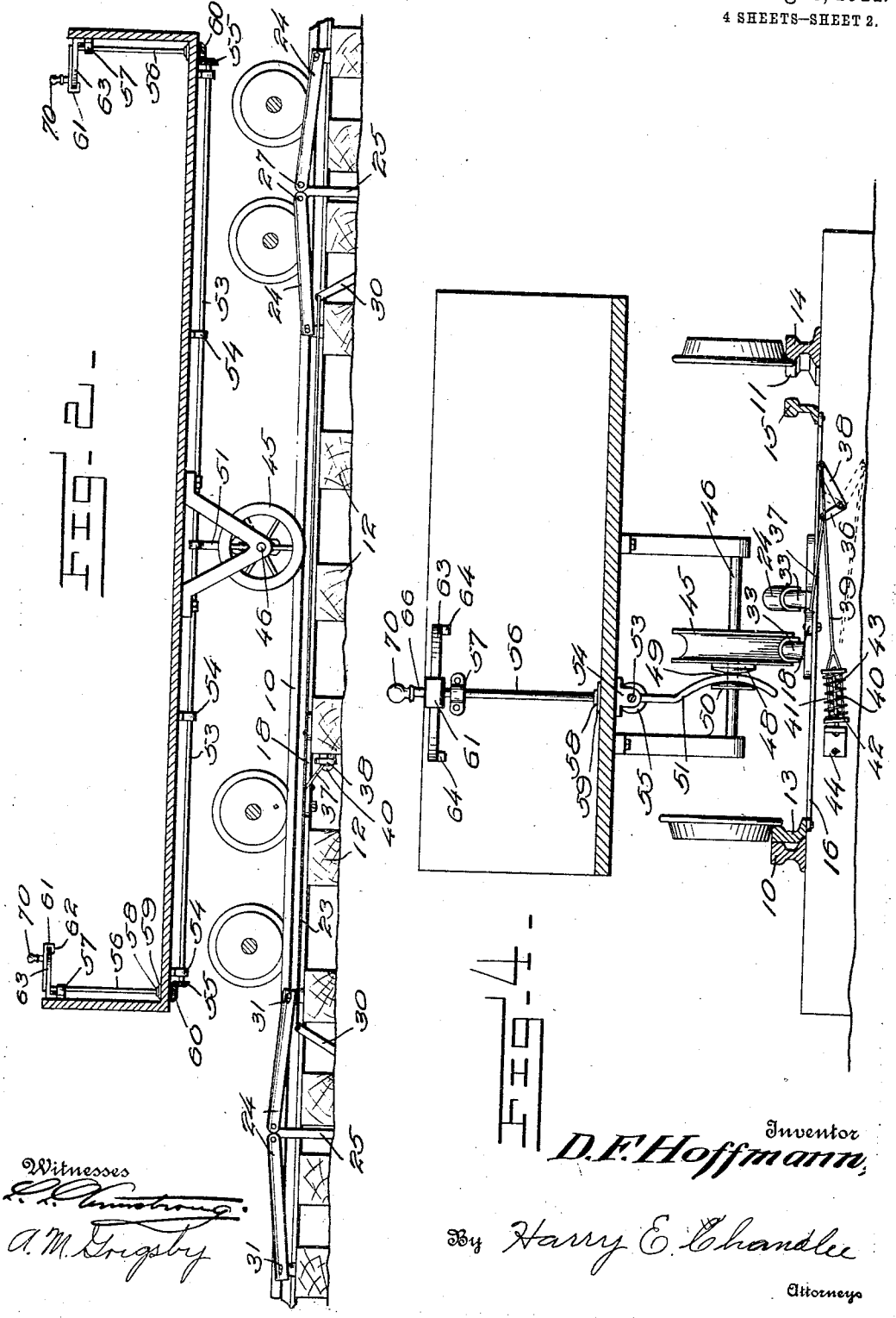
Inventor
D. F. Hoffmann,

Harry C. Chandler
 Attorneys

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Witnesses
[Signature]
 A. M. Briggsby

Inventor
D. F. Hoffmann

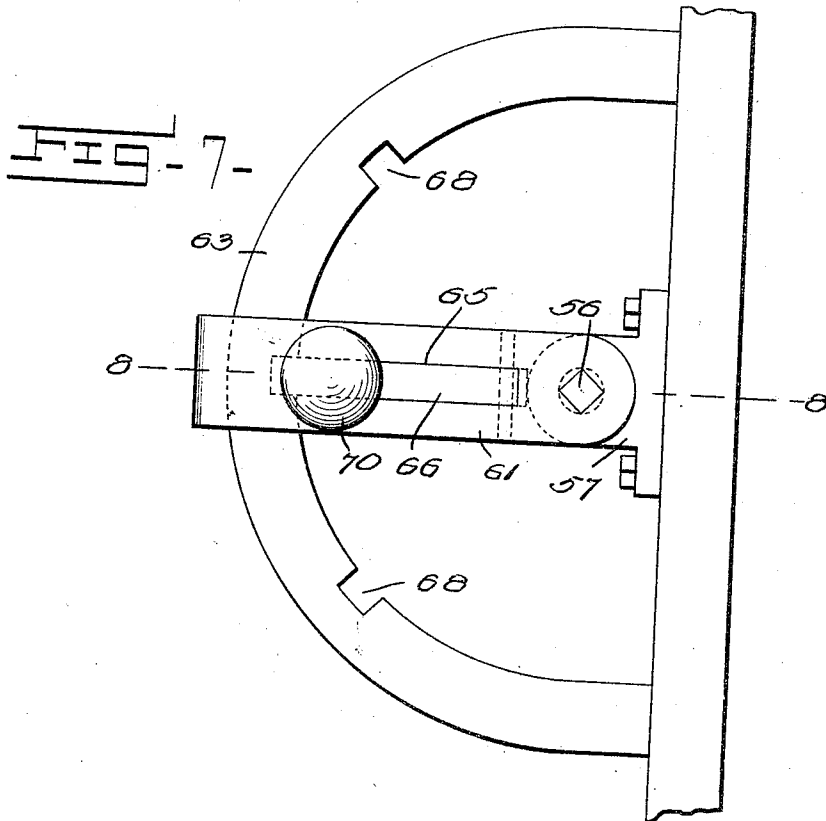
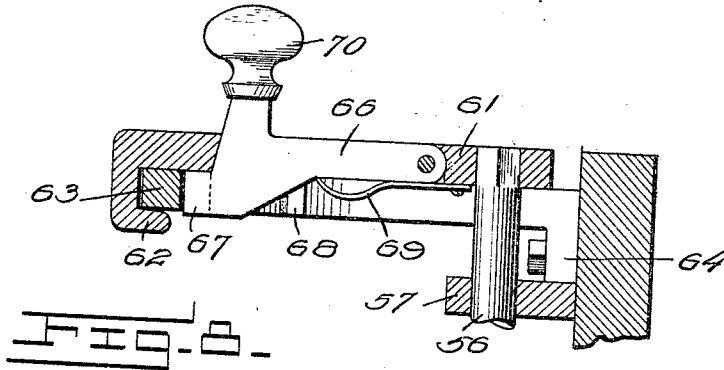
By *Harry E. Chandler*
 Attorneys

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4 SHEETS-SHEET 3.



Witnesses
[Signature]
 a. m. Gingsby

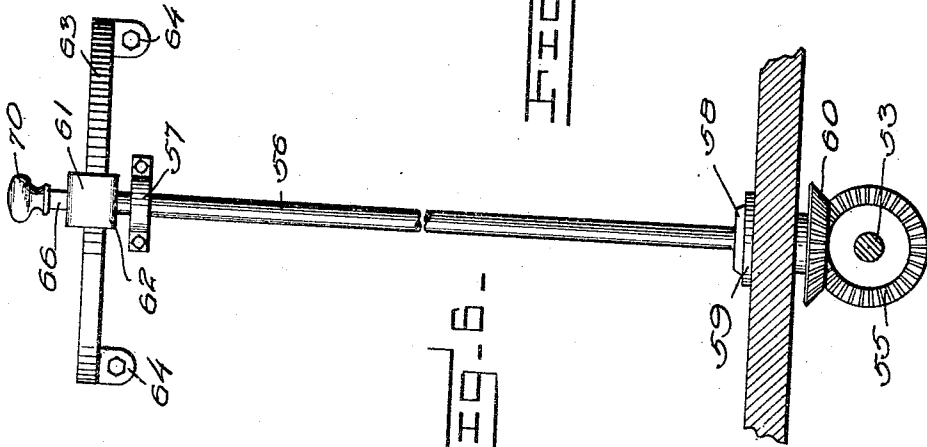
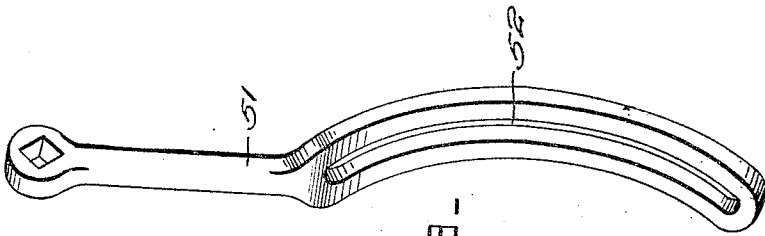
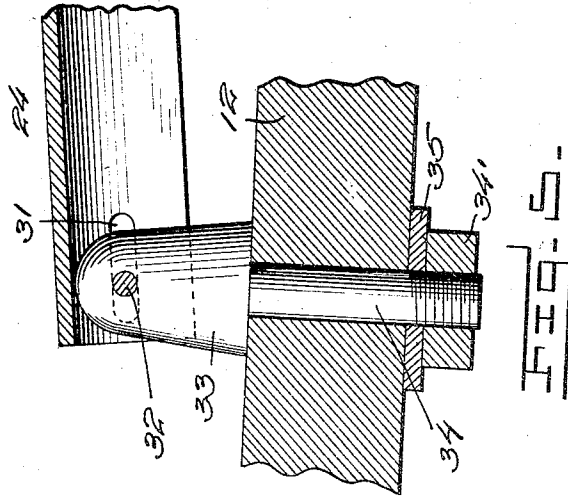
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4 SHEETS—SHEET 4.



Inventor
D. F. Hoffmann,

By *Harry E. Chandler*

Attorney

Witnesses

A. M. Gregory

A. M. Gregory

UNITED STATES PATENT OFFICE.

DANIEL F. HOFFMANN, OF SEGUIN, TEXAS.

AUTOMATIC RAILWAY-SWITCH-OPERATING MECHANISM.

999,999.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed November 8, 1910. Serial No. 591,290.

To all whom it may concern:

Be it known that I, DANIEL F. HOFFMANN, a citizen of the United States, residing at Seguin, in the county of Guadalupe and State of Texas, have invented certain new and useful Improvements in Automatic Railway-Switch-Operating Mechanism, of which the following is a specification.

This invention relates to an automatic railway switch operating mechanism and the primary object of the invention is to provide a novel arrangement of levers operatively connected to the switch points and novel means carried upon the car for operating the levers to throw the switches, so that the train or car may be guided into a siding or to continue upon the main line.

Another object of the invention is to so provide operative mechanism that the same may be operated when the cars are moving in either direction.

A further object is to provide novel means for retaining the switch points in positive engagement with the main line rails when said points are thrown by a car traveling past at a high speed.

Other objects and advantages will be apparent from the following description, and it will be understood that changes in the specific structure shown and described may be made within the scope of the claims without departing from the spirit of the invention.

In the drawings: Figure 1 is a plan view of a section of a track showing the parts in a position when the points are open to direct a car into a siding and also showing the switch points and parts in dotted lines in the opposite position, Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1 and looking in the direction indicated by the arrows, a car provided with my improved switch operating mechanism being shown in section thereon, Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 1, Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1 and looking in the direction indicated by the arrows, a car being shown in section, Fig. 5 is a detail sectional view illustrating the manner of securing the tread bars at each end thereof, Fig. 6 is an enlarged elevation of the operating shaft and connected lever carried upon the car, Fig. 7 is a top plan view thereof, Fig. 8 is an enlarged sectional view partly in elevation on the line 8—8 of Fig. 7, Fig. 9 is an enlarged

detail of the operating arm for throwing the switch operating wheel.

Referring to the drawings in detail, I have illustrated my improved mechanism, in which the numerals 10 and 11 designate the main line track rails, which are mounted in the usual manner upon ties 12, the switches being indicated at 13 and 14, the former of which is movably adapted to be actuated as a switch point in connection with the movable switch point 15 forming a portion of the main line. The switch points 13 and 15 are connected by an adjustable coupling rod 16 which is pivotally connected centrally of its length as shown at 17 to the outer end of an arm 18 which is pivotally secured to an adjacent tie as shown at 19, said arm having oppositely extended cross arms 20 and 21 preferably formed integral therewith and having connecting rods 22 and 23 pivotally secured at their outer ends and extending in opposite directions along the length of the track as shown in Fig. 1 of the drawings, the arm 18 being formed with an elongated slot where it is secured to the coupling rod 16 so as to allow for movement of the coupling rod in throwing the switch points during the swinging movement of said arm.

In order to operate the arm 18 to throw the switch points, I dispose certain of the ties in closer relation adjacent the oppositely extended ends of the rods 22 and 23 and centrally between the rails 10 and 11 and longitudinally thereof, I provide the tread bars 24 which are preferably constructed of metal of U-shaped form and are inverted for attachment to a vertical arm 25 having oppositely extended ears 26 at its upper end which are perforated and pivotally connected to the inner ends of the bars by means of bolts 27, said bars having longitudinal ends so that when they are moved from an inclined position as shown in Fig. 3, they will properly move past each other. The lower end of the vertical arm 25 to which the bars 24 are secured is pivotally connected to a horizontal arm 28 of a bell crank lever which is pivotally mounted upon a hanger 29 bolted to two of the ties as shown and the other arm 30 of the lever extends upwardly and is connected at its upper end to one of the rods 23. The outer ends of each of the bars are slotted as shown at 31 and are engaged with bolts 32 for longitudinal sliding movement so as to allow for the downward movement

of the bars when depressed to operate the bell crank lever and these bolts are properly carried by the circular headed portions 33 of bolts 34 secured to the ties, so that the U-shaped bars may be fitted thereon to allow proper movement of the bars to the degree necessary. These bolts 32 have reduced ends upon which nuts 34' and washers 35 are secured. As is shown in Fig. 1, two of such operating mechanisms are employed centrally between the rails and connected by the rods 23 to the arm 21 for throwing the switch points, one of said treads being extended into the siding. Disposed upon one side of the said tread bars are similar tread bars which are connected to the rods 22 adapted to actuate the arm 20 in throwing the switches in the opposite direction and in order to retain the switch points in positive engagement with the main line rail to prevent said switch points from moving therefrom during the passage of a train over the main line at a high speed, I pivotally secure a bell crank lever to the face of the tie adjacent the coupling rod 16, said lever having its shorter arm 36 pivotally connected to said coupling rod by a link 37 and the longer arm 38 of the bell crank lever is extended above the arm 36 and connected by a rod 39 to a coil spring 40, this attachment is made by forming the rod 39 with bifurcated extensions 41 which are secured to a plate 42 at the opposite end of the spring and a similar plate is mounted upon the other end of the spring, the bifurcated extensions 41 being movable therethrough and a rod 43 is attached to this plate and extended through the opposite plate and pivotally secured to the tie as shown at 44. Thus when the coupling rod 16 is moved to throw the switch points and clear the main line, the link 37 will be moved to swing the bell crank lever in the position shown in dotted lines with the longer arm 38 in a downward position, pulling force of the spring being exerted above the pivot of the lever when the switch points are in the opposite position to clear the siding and the pulling force of the spring being below said pivot when in the position just mentioned, thus causing the points to be held tightly into engagement with the main line rails.

In order to actuate the switch points by depressing the tread bars in the manner set forth, from the car passing over the track rails, I provide a wheel 45 which has a concaved peripheral surface adapted for engagement with the tread bars so that they will be positively depressed, said wheel being rotatably and slidably mounted upon an axle 46 which is properly held in the V-shaped hangers securely bolted to the platform of the car. The hub of the wheel 45 is provided with an extension 48 which is reduced in diameter as shown at 49, said re-

duced portion having a flange member 50 removably attached thereto and adapted to retain the slotted end of an arm 51 in position upon the reduced portion 49, and in order to have proper engagement therewith when the wheel is moved longitudinally upon the axle 46, the arm 51 is curved to fit the curvature of the inner face of the flange member 50 and the slot 52 in the arm 51 is of suitable length so that the reduced portion may have movement therein. The arm 51 is preferably formed of metal pipe and is rigidly connected to a shaft 53 of similar stock which is rotatably mounted in bearings 54 secured to the under side of the platform of the car and carrying beveled gear wheels 55 at each end thereof. A vertical operating standard 56 is rotatably mounted adjacent the vertical wall at each end of the car by means of a bearing 57 at its upper end, the lower end thereof having a bearing collar 58 secured thereto and adapted to limit the downward movement of the standard and to form a proper bearing therefor in connection with a plate 59 secured to the platform of the car and said standard extends through the platform and has a beveled gear wheel 60 upon the lower end thereof in mesh with the gear wheel 55 so that rotation of the standard will rotate the shaft 53 to swing the arm 51 and move the wheel from a central position upon the axle 46.

For operating either of the standards 56 the upper ends of each are squared and levers 61 are fitted thereon, said levers having their end portions bent in hooked form as shown at 62 so as to retain the same from upward movement when engaged around the peripheral edge of a segmental rack arch 63 which is properly bolted at each end of the vertical end walls of the platform by forming the rack arch with down turned portions 64 which are bolted to the vertical portions as shown. The levers 61 are adapted to be swung in a circular path upon the rack arches and in order to retain the same in a proper position according to the movement desired to be transmitted to the operating wheel 45, I provide each of the levers with a longitudinal slot 65 in which a latch bolt 66 is pivotally mounted at its inner end, said latch bolt having a projection 67 adapted to engage with the notches 68 formed in the inner edge of the rack arch and held in engagement therewith by means of a plate spring 69 which is secured to the under surface of the lever 61 and has a hooked end adapted for engagement with the latch bolt, said lever having a vertical extension upon which is secured a suitable hand grip 70 for the operator. Thus when it is desired to operate the arm 18, the pivotal latch is depressed to disengage the projection 67 from each of the notches 68, and the lever may be

readily moved to the right or left according to the direction in which it is desired to move the arm 51 and operating wheel, the standard 56 being adapted to rotate the shaft 53 by means of the intermeshing gears carried thereby.

In the operation of the device, the tread bars are normally raised at their central points to project a slight distance above the rails of the track when the said track is not clear and by way of example, we will consider that a car is traveling on the main line tracks toward the switch points as indicated by the arrow in Fig. 1, and if the operator desires to remain on the main track he will move the wheel 45 to a central position by swinging the lever 61 until the projection 67 is engaged with the central notch 68. The wheel will then engage with the tread bars 24 as the approaching end depresses the same, to swing the bell crank lever connected to the arm 25, causing a pull to be exerted upon the rod 23 to swing the arm 21 which is connected to the bell crank lever by said rod and thus throw the coupling member and connected switch points to the position indicated in dotted lines by means of the arm 18, the slot therein compensating for the slight degree in movement necessary in swinging the arm 18 upon its pivot point as a center. The main tracks are then cleared for the continuance of the car upon the main line and during this operation the other of the rods 23 has been moved to raise the other bars 24 by an opposite movement of the bell crank lever connected thereto and at the same time the arm 20 is swung in an opposite position to raise the bars connected thereto by the rod 22 at the entering end of the car and depressing the bars at the switch end and thereby placing the same in position for another operation. It is also apparent that the tread bars which are arranged off center may be operated by moving the wheel 45 to one side or the other through the medium of the operating lever, so that it will properly engage said bars. Thus it will be apparent that the switch mechanism will at all times be in position for operation and the provision of the spring 40 and parts connecting the same to the coupling rod 16, the switch points will be retained in position when the train or car is passing over the main line at a high speed, thereby preventing the car from entering the siding as oftentimes happens with a serious loss of life. My operating means upon the car will also be found efficient and practical for throwing switches.

In the drawings I have shown levers 61 upon each end of the car, but it will be, of course, understood that one lever may be employed, and the same may be conveniently removed from the vertical standard 56 upon

one platform by the motorman, and placed upon the standard mounted upon the opposite end of the car, as the occasion may require. This may be accomplished, when the projection 67 of the lever 61 rests in one of the notches 68 of the arch 63.

Having thus described my invention, what I claim is:

1. In an automatic railway switch operating mechanism, the combination with track rails and switch rails cooperating therewith, said rails having movable ends; of a coupling bar connecting said ends, a lever having three arms, one of which is connected to the coupling bar centrally of its length, pairs of tread members mounted between the rails, each of said tread members comprising a pair of bars pivotally mounted at each end, a vertical arm connecting the inner ends of the bars, a bell crank lever having one arm connected to the other end of the vertical arm and rods connecting the other arms to the bell crank levers with the other pair of arms of the first mentioned lever, means connected to the coupling rod for retaining the switch points in positive engagement with the main line tracks, and means for depressing said tread members to throw the switch points.

2. In a switch operating mechanism, the combination with main line tracks, siding tracks and supporting ties therefor, each of said tracks having a movable point; of a coupling member for said points, tread members disposed in pairs upon opposite sides of the switch points and disposed longitudinally of the tracks, operative connections between the tread members and the coupling member for moving the same to throw the switch points in opposite positions, a bell crank lever mounted upon one of the ties adjacent the coupling member, one arm of the lever being pivotally connected with the coupling member, a spring pivotally mounted upon the tie, a rod connecting said spring to the other arm of the lever, said spring being adapted to retain the switch points in one position and means for depressing the tread bars to move the coupling member and throw the switch points as desired.

3. In a switch operating mechanism, the combination with main line tracks and siding tracks, each of which is provided with a movable section connected together and operative mechanism connected thereto; of means carried by a car for operating said mechanism, said means comprising a depressible engaging member slidably mounted beneath the car, a shaft rotatably secured to the platform of the car, an arm carried by the shaft and slidably secured to the engaging member, operating standards connected to rotate said shaft, means for rotating the standards and means for holding the same in an adjusted position.

4. In an operating mechanism for throwing switches, the combination with movable switches of a track section and depressing members adapted for actuating the same; 5 of means carried by the car for depressing the members to throw the switches, said means comprising an axle journaled beneath the platform of the car, a wheel having a concaved peripheral surface, said wheel being slidably mounted upon the axle. 10 an extension on the wheel having a reduced portion, a shoulder removably secured thereto, a shaft removably secured to the under side of the platform, an arm carried thereby and having a slot fitted over the reduced 15 portion, gear wheels secured to the ends of

the shaft, vertical standards, gear wheels carried at the lower ends of the standards in mesh with said gear wheels and the shaft, a lever secured to each standard for rotating the same, said standards being journaled to the end walls of the car, a segmental rack arch and a latch carried by each lever for engagement with said latch plate to hold the lever in an adjusted position according to the position desired to be given the wheel. 20 25

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

DANIEL F. HOFFMANN.

Witnesses:

HENRY JULIUS BLUMBERG,
HELMAR HERMAN WEINER.