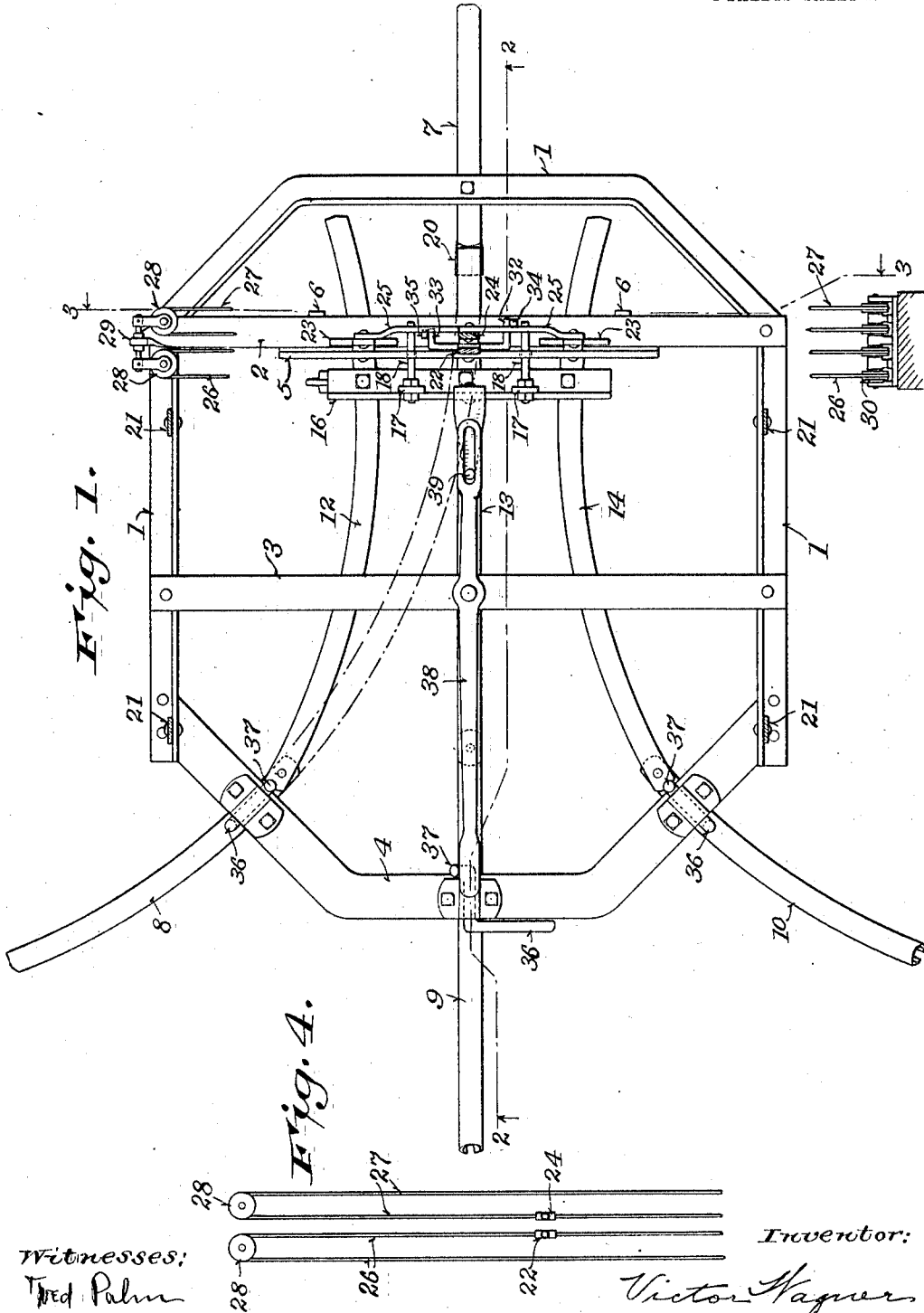


V. WAGNER.
 SWITCH FOR ELEVATED TROLLEY TRACKS.
 APPLICATION FILED AUG. 14, 1912.

1,059,412.

Patented Apr. 22, 1913.

2 SHEETS—SHEET 1.



Witnesses:
 Fred Palm
 Chas. L. Coas.

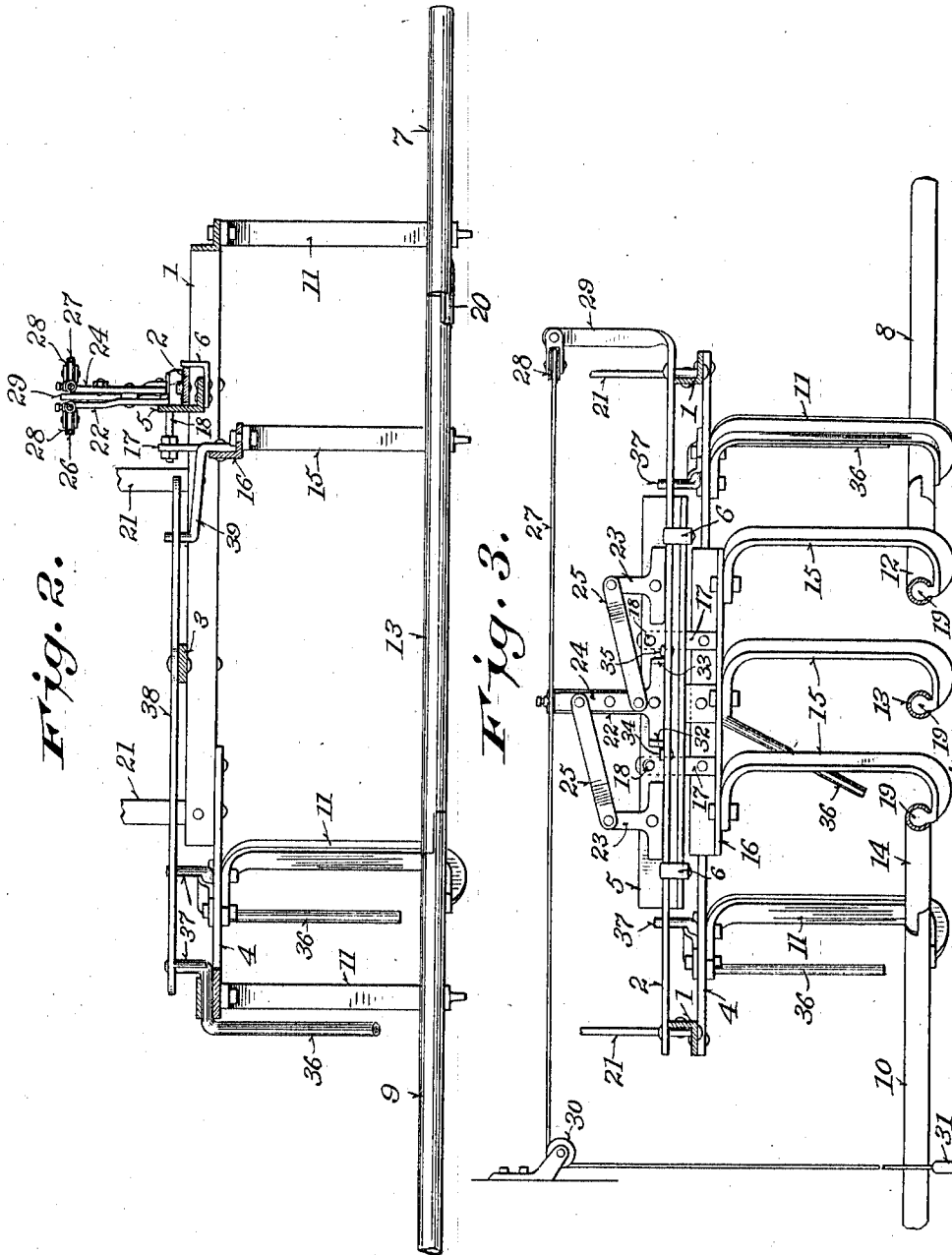
Inventor:
 Victor Wagner
 By Flanders, Botkin, Fawcett & Botkin
 Attorneys.

V. WAGNER.
SWITCH FOR ELEVATED TROLLEY TRACKS.
APPLICATION FILED AUG. 14, 1912.

1,059,412.

Patented Apr. 22, 1913.

2 SHEETS-SHEET 2.



Witnesses:

Fred Palm

Chas. R. Goss.

Inventor:

Victor Wagner.

By *Flaender Bothum Fawcett Bothum*
Attorneys.

UNITED STATES PATENT OFFICE.

VICTOR WAGNER, OF WATERLOO, WISCONSIN, ASSIGNOR TO DREW CARRIER COMPANY, OF WATERLOO, WISCONSIN, A CORPORATION OF WISCONSIN.

SWITCH FOR ELEVATED TROLLEY-TRACKS.

1,059,412.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed August 14, 1912. Serial No. 714,954.

To all whom it may concern:

Be it known that I, VICTOR WAGNER, a citizen of the United States, residing at Waterloo, in the county of Jefferson and State of Wisconsin, have invented certain new and useful Improvements in Switches for Elevated Trolley-Tracks, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

The main objects of this invention are to avoid angles or turns in the track lines, to provide for the use of straight stretches of flexible wire or cable track with inflexible curved sections and switches, and generally to improve the construction and operation of devices of this class.

It consists in the construction, arrangement and combination of parts as herein-after particularly described and pointed out in the claims.

In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is a plan view of a three-way switch embodying the invention; Fig. 2 is a vertical longitudinal section of the same on the line 2—2, Fig. 1; Fig. 3 is a vertical cross section on the line 3—3, Fig. 1; and Fig. 4 is a plan view of a part of the cords and pulleys for operating the switch gates.

The switch in its preferred and most complete design, comprises a supporting frame which may be conveniently constructed as shown, of a metal angle bar 1, bent into U-form, and of flat metal cross bars 2, 3 and 4, the bars 2 and 3 being bolted to the upper side and the cross bar 4 to the under side of the angle bar 1. The cross bar 2 serves as a guide rail for a slide 5, consisting of a metal angle bar loosely confined on said rail by angular keepers 6, permitting of a limited vertical movement as well as a lengthwise movement of the slide relative to the guide rail. A main track section 7 and branch track sections 8, 9 and 10 are suspended from said supporting frame by offset metal hangers 11. The main track section is suspended and supported from the center of the cross piece of the angle bar 1 at one end of the frame, and the branch track sections 8, 9 and 10 are suspended from the cross bar 4 at the opposite end of said frame.

Horizontally swinging switch gates 12, 13 and 14 are pivoted at one end to the prox-

imate ends of the branch track sections 8, 9 and 10 respectively, adjacent to their supporting hangers 11, and are movable at their free ends into line one at a time, with the main track section 7. The several switch gates are suspended and supported adjacent to their free ends by hangers 15, like or similar to the hangers 11, from a transverse connecting and shifting bar 16. The bar 16, which is preferably made of metal and of angular section, is connected with the slide 5 by upwardly projecting arms 17 and rods 18, secured in the upper ends of said arms and transversely thereto, the rods 18 passing loosely through and being movable lengthwise in the vertical limb of the angle bar slide, so as to permit of lateral and angular movement of the bar 16 relative to the slide.

The main and branch track sections and the switch gates, and particularly the stationary track sections, are preferably made of tubular or hollow form and longitudinally slotted in the under side, and are practically rigid or inflexible, but they may be made of solid form and of any suitable section. The hangers 11 and 15 are formed at their lower offset ends with upwardly projecting cylindrical bosses or enlarged lugs 19, which fit into the hollow track sections and gates and confine them in place thereon.

The inner end of the main track section 7 with which the movable ends of the switch gates are brought into alinement, is provided with a step bearing 20, concaved or recessed on the upper side to receive and hold the end of the gate which is turned into register or alinement with the main track section, the gates being loosely pivoted to the branch sections 8, 9 and 10 and capable of a slight vertical movement in order to shift them into and out of engagement with said step bearing. The tubular slotted construction of the main and branch track sections affords convenient means for connecting in alinement with their outer ends, rigid or inflexible tubular track sections of like construction, or flexible wire or cable track which is used in connection with automatic dumping and return carriers.

The switch is suspended bodily from a ceiling, overhead frame work or other support, by metal straps 21, riveted or bolted at their lower ends to the vertical limb of the angle bar 1. The switch may be made with

two or more gates, as required. In a three-way switch like that shown in the drawing, the middle gate 13 is preferably and ordinarily straight, while the two outer gates 12 and 14 are preferably and generally curved, as shown in Fig. 1. In a two-way switch both of the gates may be curved, or one of them may be straight and the other curved, according to the relation of the branch tracks to the main track.

When the switch is accessible from the floor or ground the gates may be shifted by hand or with a pitchfork or other similar implement, but when it is located too high to be accessible for direct manual operation, it is provided with connections leading to an accessible point for shifting the gates.

In a three-way switch as shown by the drawing, three inverted T-shaped levers 22 and 23 are pivoted or fulcrumed at the junction of their arms to the vertical limb of the slide 5 with their cross arms normally resting upon the upper side of the guide rail 2 and their middle arms extending upwardly therefrom, as shown in Fig. 3. A lever 24 is pivoted or fulcrumed between its ends to the middle arm of the lever 22 above its fulcrum or pivot connection with the slide 5, and is connected on opposite sides of and equidistant from its pivot or fulcrum connection with said lever 22 by links 25, with the upper ends of the levers 23.

Operating cords 26 and 27 passing horizontally around pulleys 28, mounted on an upwardly projecting arm 29 of the switch supporting frame, have their inner spans fastened to the upper ends of the levers 22 and 24 respectively and pass over guiding pulleys 30, located on the opposite side of the switch from the pulleys 28 to some accessible and convenient point where their ends are provided with handles 31, as shown in Fig. 3.

The cross arm of the lever 22 is formed with lateral projections 32 and 33 of different lengths, to cooperate with lugs or stops 34 and 35 on the upper side of the guide rail 2. The longer projection 32 cooperates with the stop lug 34 when the switch is shifted to the left, as shown in Fig. 3, and is cut away to clear the stop lug 35 when the switch is shifted to the right, while the shorter projection 33 cooperates with the stop lug 35 when the switch is shifted to the right, and clears the stop lug 34 when the switch is shifted to the left, the stop lugs 34 and 35 being arranged out of alinement with each other in the direction of the length of the guide rail 2.

To block the branch tracks and prevent the carrier or trolley from running off when the corresponding switch gates are open, laterally swinging stop rods 36 are pivoted at their upper ends to the cross bar 4 above the several branch track sections 8, 9 and 10,

and normally stand in a vertical position, obstructing the path of the carrier or trolley toward and adjacent to the corresponding switch gates 12, 13 and 14. The pivot pins at the upper ends of the stop rods 36 are formed or provided with crank arms 37, projecting normally upward into the path of one arm of a horizontal lever 38, which is fulcrumed between its ends on the cross bar 3. The other arm of the lever 38 is longitudinally slotted and engages with a crank arm 39 on the connecting and shifting bar 16.

In the operation of a three-way switch as herein shown and described, the middle gate 13 being in alinement with the main track section 7 and connecting it with the middle branch track section 9 which is cleared by the stop rod 36, while the other branch track sections 8 and 10 are blocked by the corresponding stop rods 36, if it is desired to connect the branch track section 8 with the main track section 7, the switch gates are shifted to the left, as shown in Fig. 3, so as to carry the gate 13 out of alinement and the gate 12 into alinement with the main track section 7, as indicated by dotted lines on Fig. 1. This is accomplished by the operator pulling the inner span of the cord 27 toward the pulleys 30, or to the left, as shown in Fig. 3. The effect of this is first to turn the lever 24, as shown in Fig. 3, to the left, into a position oblique to the middle arm of the lever 22, thereby through the links 25 tilting the levers 23 one to the left and the other to the right, and lifting the slide 5 together with the lever 22, the shifting bar 16, hangers 15 and gates 12, 13 and 14, bodily. The middle gate 13 is thus moved upwardly out of engagement with the step bearing 20, whereupon the slide 5 with the several parts suspended therefrom, including the several switch gates, is shifted to the left, as shown in Fig. 3, until the advance end of the slide 5 engages the adjacent side of the angle bar 1 and thereby arrests the lateral movement of the gate 12 directly over the step bearing 20. The cord 27 being now released by the operator, the slide 5 and the switch gates suspended therefrom, descend by gravity, the free end of the gate 12 dropping into engagement with the step bearing 20 and into alinement with the main track section 7, and the levers 23 and 24 resuming their normal positions. If now it is desired to shift the switch back to its former position with the middle gate 13 in alinement with the main track section 7, the inner span of the cord 26 attached to the lever 22 is drawn toward the pulleys 28, or to the right, as shown in Fig. 3, thereby first tilting the lever 22 on its pivot or fulcrum connection with the slide 5 to the right, as shown in Fig. 3, and lifting its longer projection 32 out of contact with the guide

rail 2, and then shifting said slide to the right, as shown in Fig. 3, till the shorter projection 33 is brought into engagement with the stop 35 and arrests the free end of the middle gate 13 directly over the step bearing 20. The cord 26 being released by the operator, the gate 13 drops by gravity into engagement with said step bearing and into alinement with the main track section 7, and the lever 22 resumes its normal position.

If when either of the outer gates 12 and 14, for instance, the gate 12, is in register with the main track section 7, it is desired to shift the switch to its other extreme position so as to carry the gate 14 into engagement with the step bearing 20 and into alinement with the main track section 7, the inner span of the cord 27 is drawn by the operator toward the pulleys 28, or to the right, as shown in Fig. 3, thereby first tilting the lever 24 to the right, as shown in Fig. 3, into a position oblique to the middle arm of the lever 22 and through the links 25 tilting the levers 23 so as to lift the slide 5 and the parts suspended therefrom; as hereinbefore explained. The lever 22 being thus lifted with the slide 5, so that both of its projections 32 and 33 will clear the stop lugs 34 and 35, the slide 5 is drawn by a continued pull on the cord 27, to the right, as shown in Fig. 3, till the advance end of the slide engages with the adjacent side of the angle bar 1 and thereby arrests the lateral movement of the switch gates when the gate 14 is directly over the step bearing 20. The cord 27 being now released, the gate 14 drops into engagement with said step bearing and into alinement with the main track section 7 and the levers 23 and 24 resume their normal positions.

In shifting the switch gates as above explained, the lever 38 is correspondingly shifted by its connection with the bar 16 and by engagement with the crank arm 37 of the stop rod 36 of whichever branch track section is connected by its gate with the main track section 7, turns and holds such stop rod out of operative position, the other stop rods being held by gravity in their normal positions and blocking the other branch tracks whose switch gates are open.

From the foregoing explanation it will be understood that by like or similar manipulations of the operating cords 26 and 27, any of the several gates 12, 13 and 14 may be shifted from any position of the switch into engagement with the step bearing 20 and into alinement with the main track section 7, the branch track whose gate is closed, being at the same time cleared, while the other branch tracks whose gates are open, being blocked by the stop rods 36.

In some installations of the switch, the

operating cords may be connected directly with the shifting bar 16, and the slide 5 with the levers mounted thereon may be omitted; and when the gates are accessible for operation by hand or with a pitchfork or other implement, both the cords and pulleys and the slide 5 with its attachments, and even the metal supporting frame, may be omitted.

Various changes in the details of construction and arrangement of parts other than those specifically mentioned may be made without departing from the principle and scope of the invention as defined in the following claims.

I claim:

1. In a switch for elevated trolley tracks, the combination of stationary track sections, horizontally movable and connected switch gates, one of which is curved, each pivoted at one end respectively to the proximate ends of said stationary sections, and another stationary track section into end register with which said gates are adapted to be turned, one at a time.

2. In a switch for elevated trolley tracks, the combination of stationary track sections, switch gates each pivoted at one end respectively to the proximate ends of said sections and adapted to swing horizontally thereon, a longitudinally movable operating bar located above and transversely to the movable ends of the gates and connected therewith by hangers, and another stationary track section into end register with which said gates are adapted to be turned one at a time.

3. In a switch for elevated trolley tracks, the combination of stationary track sections, switch gates each pivoted at one end respectively to the proximate ends of said sections and adapted to be swung horizontally thereon, a longitudinally movable connecting and operating bar located above and transversely to the movable ends of the gates and connected therewith by hangers, another stationary track section into end register with which said gates are movable one at a time, pulleys and operating cords guided on said pulleys and connected with said bar for shifting the same in opposite directions.

4. In a switch for elevated trolley tracks, the combination of branch track sections, switch gates each pivotally connected at one end respectively with the proximate ends of said sections and adapted to be swung horizontally thereon, a main track section with which the movable ends of the gates are adapted to be swung into engagement one at a time, a guide rail located above and transversely to the movable ends of the gates, a slide mounted on and movable lengthwise of said rail and connected with said gates, T-levers fulcrumed on said slide with their cross arms normally parallel and in contact

with said guide rail and their middle arms extending upwardly therefrom, a lever fulcrumed on the middle arm of the middle T-lever and connected by links equidistant from its fulcrum above and below the same with the middle arms of the other T-levers, stops on said guide rail, lateral projections on the cross arm of the middle T-lever adapted to cooperate with said stops to limit the movement of the middle switch gate in either direction in position to engage with the main track section, and operating cords connected with the upper arms of the middle T-lever and of the lever mounted thereon.

5. In a switch for elevated trolley tracks, the combination of branch track sections, horizontally swinging switch gates each pivoted at one end respectively to the proximate ends of said sections and capable of vertical movement at their free ends, a main track section having a recessed step at one end into engagement with which the movable ends of the gates are adapted to be swung horizontally and vertically one at a time, a guide rail located above and transversely to the movable ends of the gates and provided with stops, a slide mounted on and movable lengthwise of said rail, a cross bar connected with the movable ends of the gates and having transverse slip connections with said slide, T-levers fulcrumed on said slide with their cross arms normally parallel and in contact with said rail and their middle arms extending upwardly therefrom, a lever fulcrumed on the middle arm of the middle T-lever and connected by links with the middle arms of the other T-levers, the cross arm of the middle T-lever having lateral projections adapted to cooperate with said stops to arrest the movement of the middle switch gate in either direction in position to engage with the main track section, and operating cords connected with the upper arms of the middle T-lever and of the lever mounted thereon.

6. In a switch for elevated trolley tracks, the combination of branch track sections, horizontally swinging gates each pivoted at one end respectively to the proximate ends of said sections, the outer gates being curved horizontally in opposite directions, a main track section into end register with which said gates are adapted to be swung one at a time, and a longitudinally movable operating bar located above and connected with the movable ends of the gates.

7. In a switch for elevated trolley tracks, the combination of a number of tubular branch track sections and a tubular main track section, all longitudinally slotted in the under side, offset hangers for suspending said track sections from an overhead support and having upwardly projecting

bosses fitting the bore of said tubular sections and confining them in place thereon, the outer ends of the tubular sections being open for the connection in alignment therewith of other track sections, and laterally swinging gates each pivoted at one end respectively to the proximate ends of the branch track sections and movable into end register with the main track section.

8. In a switch for elevated trolley tracks, the combination of a number of branch track sections, a main track section and horizontally swinging switch gates each pivoted at one end respectively to the proximate ends of the branch track sections and movable at their free ends into end register with the proximate end of the main track sections, all of said track sections and gates being of tubular form and longitudinally slotted, a connecting and shifting bar located above and transversely to said gates, and offset hangers for suspending the track sections from an overhead support and the movable ends of the gates from said connecting and shifting bar, and having upwardly projecting bosses on their lower ends inserted and confined in the bore of said track sections and gates.

9. In a switch for elevated trolley tracks, the combination of a number of branch track sections, a main track section, gates each pivoted at one end respectively to the proximate ends of the branch track sections and movable at the other end one at a time into line with the main track section, means for shifting said gates, movable stops normally blocking the branch track sections, and means operated by said gate shifting means for moving and holding said stops out of operative position and clearing the branch track whose switch is in line with the main track.

10. In a switch for elevated trolley tracks, the combination of a number of branch track sections, a main track section, horizontally swinging gates each pivoted at one end respectively to the proximate ends of the branch track sections and movable at the other end one at a time into line with the main track section, a transverse shifting bar connected with said gates, movable stops normally blocking said branch track sections, and a lever connected with said shifting bar and adapted to move and hold out of operative position, the stop of that branch track section whose gate is in line with the main track section.

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

VICTOR WAGNER.

Witnesses:

L. F. O'BRIEN,
EDW. A. PETERS.