(No Model.) 2 Sheets—Sheet 1.

C. DIETZ.

AUTOMATIC RAILWAY SWITCH.

No. 526,100. Patented Sept. 18, 1894.

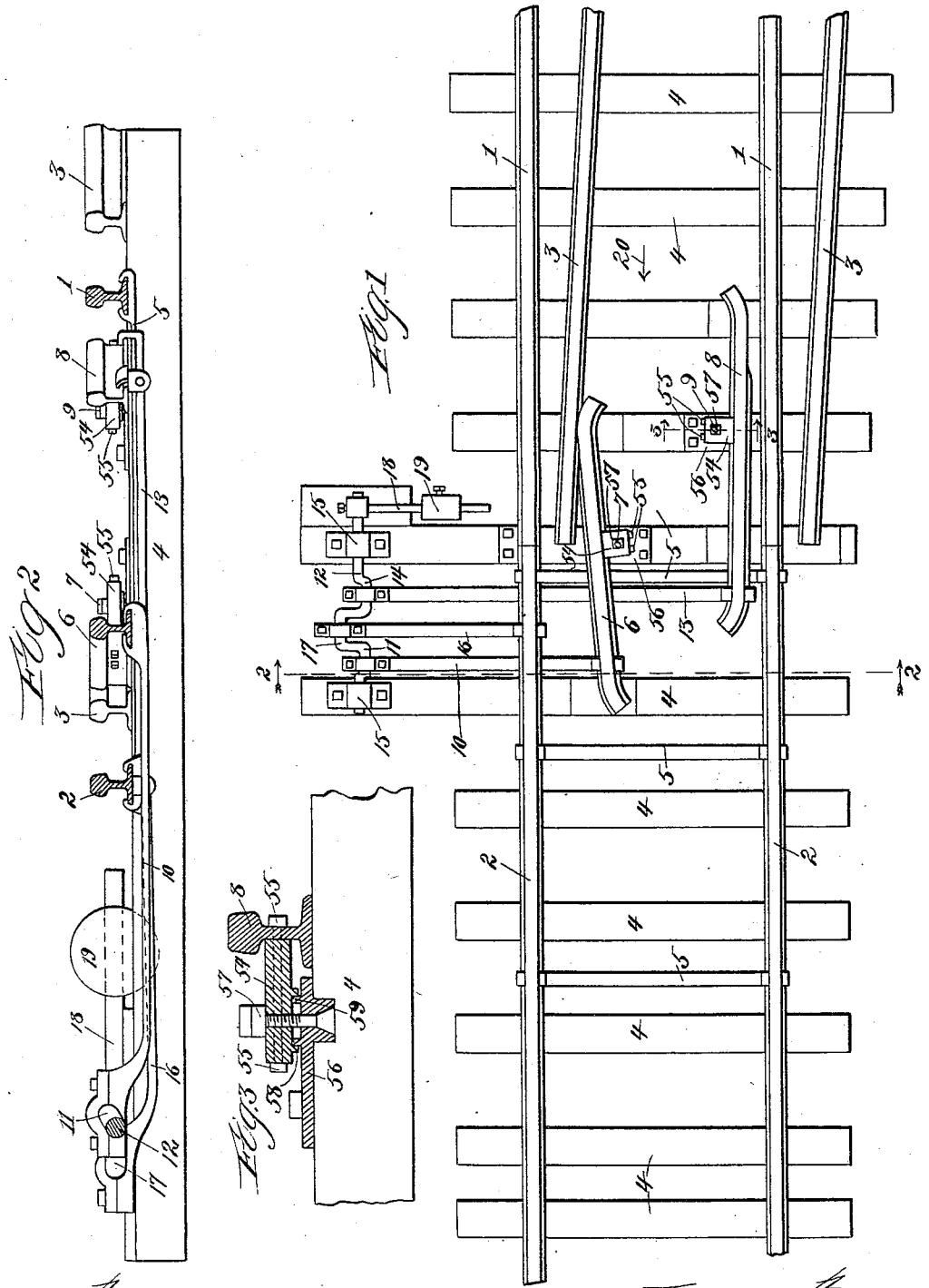

Fig. 1

Fig. 2

Fig. 3

Witnesses:
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Jno. L. Condron

Inventor:
Charles Dietz
By, Raymond & Quackenbos Attys

(No Model.) 2 Sheets—Sheet 2.

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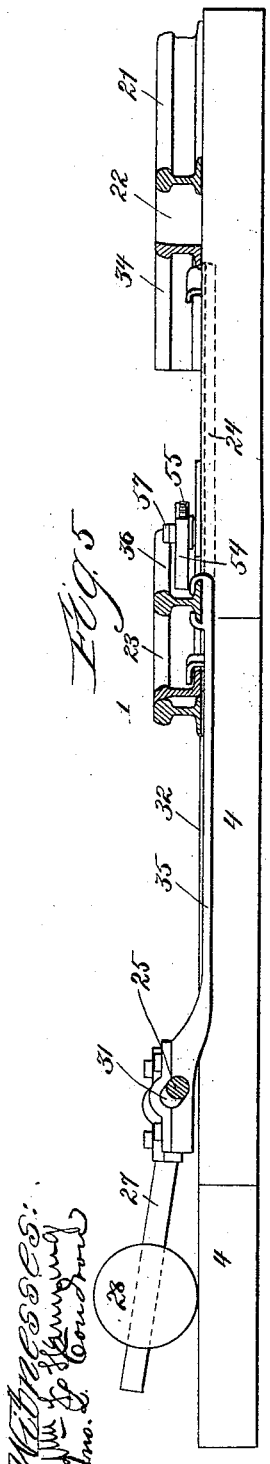

Fig. 5

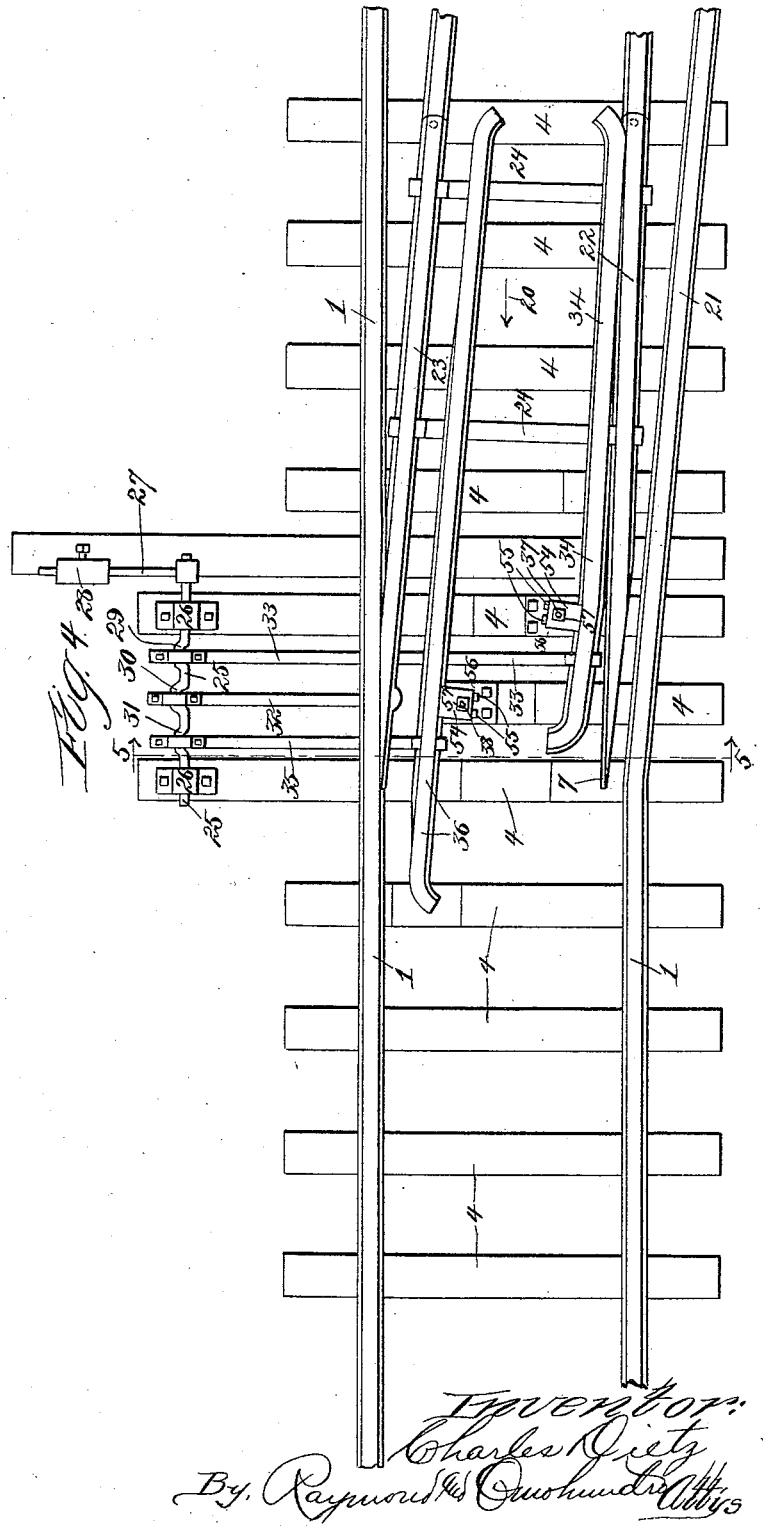

Fig. 4

Witnesses:
Wm. E. Hamund
Jno. E. Condon

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UNITED STATES PATENT OFFICE.

CHARLES DIETZ, OF CHICAGO, ILLINOIS.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 526,100, dated September 18, 1894.

Application filed September 13, 1893. Serial No. 485,383. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DIETZ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Railway-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to appliances for diverting moving railway trains or vehicles from one track to another, my invention being applicable to stub switches, split switches, and various other forms of switches used in railway yards, on sidings, and spurs, branch lines, and in various other situations.

Among the primary objects of my invention is included that of producing a switch which shall be automatically operated or thrown by the wheels of a railway vehicle, so as to avoid all possibility of derailment of such vehicles or trains, and which shall also be capable of being easily thrown by an attendant or switchman when desired; furthermore, to produce an automatic switch which shall be capable of use in a great variety of situations, and which shall be simple, strong and durable in its construction, positive and reliable in its operation, and not liable to breakage or other derangement of its parts.

The above-mentioned objects, and also such others as may appear from the ensuing description, are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a locking stub-switch embodying my invention. Fig. 2 is a transverse section, taken on the line 2—2 of Fig. 1; the direction of view being that indicated by the arrows applied to the section line. Fig. 3 is an enlarged vertical section, taken on the line 3—3 of Fig. 1; the direction of view being that indicated by the arrows adjacent to the section line. Fig. 4 is a plan view of a split switch embodying my invention. Fig. 5 is a transverse section taken on the line 5—5 of Fig. 4; the direction of view being that indicated by the arrows adjacent to the section line.

Referring first to the construction shown in Figs. 1, 2 and 3, 1 designates the main line rails; 2, the movable or switch rails of a stub switch, and 3 the rails of a siding, spur, branch, or other similarly situated track; the rails being mounted upon suitable ties or sleepers such for example as 4, and the movable or switch rails 2 being connected together by suitable tie-rods 5 so as to always move in unison. This is what I term a full throw or lay-down and self-locking switch, by which terms I imply the use of a throwing lever arranged to assume either of two opposite horizontal positions and either actuating the switch-rails or actuated by such rails, according as the switch is operated either by hand or by a railway vehicle, and, in either event, serving when in either of its horizontal positions to lock the switch.

Upon the tie or sleeper 4 which supports the ends of the main line and siding rails 1 and 3, and also the adjacent ends of the switch rails 2, is pivoted a guard rail 6; said guard rail being adjacent to the inner side of that siding rail 3 which is between the two main line rails 1, and the pivotal point 7 of said guard rail 6 being intermediate of the ends of said guard rail. Upon the tie or sleeper 4 which is the next to the sleeper upon which is pivoted the guard rail 6, and away from the switch rails 2, is pivoted a second guard rail 8; this guard rail being adjacent to the inner side of that main line rail 1 which is proximate to the outer siding rail 3, and the pivotal point 9 of the guard rail 8 being intermediate of the ends of said guard rail. There are certain peculiar structural features relating to the pivots 7 and 9 of the guard rails 6 and 8 which will be hereinafter described, but which, for the sake of clearness, are not specified just here.

Two of the corresponding ends of the guard rails 6 and 8 project betweeh the free end portions of the switch rails 2, and such projecting end portion of the guard rail 6 is connected by a coupling bar 10 to a crank section 11 of an oscillatory shaft 12, while such projecting end of the guard rail 8 is connected by a coupling bar 13 to a second crank section 14 of the said oscillatory shaft. The oscillatory shaft 12 is placed horizontally outside of and parallel with the main line and switch rails at the point of juncture of said

rails; the shaft 12 being preferably adjacent to that main line rail which is remote from the siding, and being shown as journaled at its end portions in bearings 15 secured upon the prolonged end portions of two of the ties or sleepers 4.

The free end portion of that switch-rail 2 which is proximate to the shaft 12 is connected by a suitable coupling bar such as 16 with a third crank section 17 of the shaft 12, said crank 17 being intermediate of the cranks 11 and 14. At one of its ends, the shaft 12 is provided with a rock-arm 18 carrying a counterweight 19 and extending at right angles from the shaft; said rock-arm being adapted to lie horizontally so as to extend either toward or away from the rails according respectively as the switch is to be set for the main line or for the siding. The intermediate crank section 17 extends oppositely from the rock-arm 18 but in the same plane therewith, relatively to the axial center of the shaft 12, so that in either horizontal position of the rock-arm 18 the crank section 17 extends horizontally precisely opposite the axial center of the shaft 12 and consequently the switch rails 2 are locked by the "centering" of said crank section.

When the rock arm 18 is at its innermost horizontal position, the crank section 17 extends horizontally from the rails and the switch is open for the siding and closed for the main-line; the crank section 11 extending obliquely upward and inward toward the rails and the crank section 14 extending obliquely downward and inward toward said rails. When the rock-arm 18 is at its outermost horizontal position the crank section 17 extends horizontally inward toward the rails and the switch is closed for the siding and open for the main line; the crank section 11 extending obliquely downward and outward away from the rails and the crank section 14 extending obliquely upward and outward away from said rails. It will thus be seen that when the switch rails 2 are closed for the main line, the guard rail 6 extends obliquely toward that siding rail 3 which is proximate to the shaft 12, the guard rail 8 extending about parallel with the opposite siding rail 3, while, when the switch is closed for the siding, the guard rail 8 extends obliquely toward that siding rail 3 which is remote from the shaft 12 and the guard rail 6 extends about parallel with that siding rail 3 which is proximate to said shaft.

The guard rails 6 and 8 are never directly locked, and with the switch closed for the main line, as shown in Fig. 1 and with a train or railway vehicle moving upon the siding and approaching the switch (in the direction indicated by the arrows 20) the flanges of the wheels which are proximate to the shaft 12 will strike the end of the guard rail 6 and will automatically throw said rail end away from the siding rail 3 which is proximate to the shaft 12. This movement of the guard rail 6 will oscillate the shaft 12 so as to move the rock arm 18 upward and outward away from the rails; causing the guard rail 8 to move in unison with and also in similar direction as the guard rail 6, and also causing the shaft 12 to move the free ends of the switch rails 2 out of alignment with the main line rails 1 and into to alignment with the ends of the siding rails 3. Thus the train or vehicle will pass safely from the siding and upon the main line. If now a train or railway vehicle move upon the main line rails 1 toward the switch (in the direction indicated by the arrow 20), the flanges of the wheels upon that rail 1 which is remote from the shaft 12 will strike the end of the guard rail 8, automatically moving said rail-end toward the opposite rail 1, oscillating the shaft 12 so as to throw the rock arm 18 inward toward the rails, and also moving the free ends of the switch rails from alignment with the siding rails and into alignment with the main line rails. Thus the train or railway vehicle will pass safely along the main line, and trains or railway vehicles are free to pass the switch in either direction upon the main line without any possibility of running into the siding or spur, or branch tracks.

In Figs. 4 and 5 I have shown a split switch provided with full throw lever connections. In this instance 1 designates the stationary main line rails; 21, the stationary siding rail; 22, the movable switch rail for the main line, and 23 the movable switch rails for the siding; these rails being supported upon suitable ties or sleepers, such as 4, and the movable switch rails 22 and 23 being connected together by suitable tie bars, such as 24, so as to always move in unison. An oscillatory shaft 25 is placed horizontally at one side of the track, preferably proximate to the siding-switch rail 23 so as to extend parallel with the main line rails 1; said shaft being shown as journaled in suitable bearings 26 secured upon the prolonged ends of two of the ties or sleepers 4 at the junction. At one end, the oscillatory shaft 25 is provided with a rock-arm 27 extending at right angles from the shaft 25 and carrying a counterweight 28 and intermediately of its ends said shaft is provided with three crank sections, 29, 30 and 31; the crank section 30 being placed between the crank sections 29 and 31. The crank section 30 is connected by a suitable coupling bar, such as 32, to the free end of the branch line or siding switch rail 23 and as this switch rail 23 is connected to the main line switch rail 22 by the tie bars 24 as above stated, any movements of the switch rail 23 are transmitted to the switch rail 22. The crank section 29 is connected by a suitable coupling rod, such as 33, to one end portion of a guard rail 34 while the crank section 31 is connected by a suitable coupling rod, such as 35, with one end portion of a second guard rail 36. The guard rail 34 is pivoted intermediately of its ends as at 37,

upon one of the sleepers 4, and lies adjacent to the inner side of the main line switch rail 22. The guard rail 36 is pivoted intermediately of its ends, as at 38, upon a tie or sleeper 4 at the junction, and lies adjacent to the inner side of the siding switch rail 23. Certain peculiarities of construction appertain to the pivot connections 37 and 38, but for the sake of clearness, they will be described later on.

When the rock arm 27 of the shaft 25 is at its outermost horizontal position the switch is closed from the siding to the main line, so as to allow the train or railway vehicle to pass from the former to the latter in the direction indicated by the arrow 20 in Fig. 4. In this position of the switch, the guard rail 34 extends obliquely toward the inner side of the main line switch rail 22, while the guard rail 36 extends about parallel with that main line rail 1 which is remote from the said main line switch rail. With the switch in this position and with a railway train or vehicle moving upon the main line toward the switch (in the direction indicated by the arrow 20 in Fig. 4) the flanges of these wheels which are proximate to the main line switch rail 22 will strike the end of the guard-rail 34 so as to throw said rail-end toward the siding switch rail 23. The main line switch rail 22 will of course be compelled, by the tie-bars 24, to move with the siding switch rail, and the shaft 25 will be so oscillated as to throw the rock arm 27 to its innermost horizontal position, and the guard rail 36 will be so moved as to extend obliquely toward the siding switch rail 23, while the guard rail 34 will be so moved as to extend about parallel with the main line switch rail 22. The switch will thus be closed to the siding and open to the main line, and with a railway train or vehicle moving upon the siding and toward the switch (in the direction indicated by the arrow 20 in Fig. 4) the flanges of those wheels which are upon the siding switch rail 23 will first gradually crowd said switch rail toward the shaft 25 and will then strike the end of the guard rail 36 so as to throw said rail end toward the main line switch rail 22. This movement of the guard rail 36, acting through the coupling bar 35 and crank section 31 oscillates the shaft 25 so as to throw the rock arm 27 to its outermost horizontal position and so also as to move the guard rail 34 obliquely toward the main line switch rail 22, and the guard rail 36 will extend about parallel with the siding switch rail 23.

I have described the switch rails shown in the several figures of the drawings as main line and siding switch rails, but I desire again to state that wherever the term "siding" is used, a spur, branch or other analogous part of railway roadway is to be understood.

I will now describe certain peculiar details of construction relating to the pivots 7, 9, 37, 38, 49, and 51, and also to the fillers 52 and 53 above referred to. Referring first to Figs. 1, 2 and 3 the pivot bolts 7 and 9 extend each vertically upward through a filling block 54 which extends horizontally outward from the web of the corresponding guard rail 6 or 8, and which is secured to the web by horizontal bolts 55 extending through the filling block and through the guard rail web. The lower headed end of each pivot bolt 7 or 9 is inserted into the under side of a wear plate 56 which is bolted upon the adjacent sleeper 4, and said bolt 7 or 9 extends upward through said wear plate and has retaining nuts 57 screwed upon its upper end. Lateral play of the pivots is prevented by circular ribs 58, on the under side of the filling blocks, engaging similar ribs 59 on the upper sides of the wear plates 56. The attachments for the pivots 37 and 38 of the guard rails 34 and 36 in Figs. 4 and 5 are precisely similar to those just described and are designated by like numerals of reference.

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

In an automatic railway switch, the combination with the main, siding and switch rails, of the guard rails arranged between the innermost rails and at the junction of the switch main and side rails, said guard rails being pivoted intermediate their ends, an oscillatory shaft journaled at one side of the track and having a series of crank arm sections, said sections extending alternately in opposite directions, the rod connecting the movable switch rail to one of said sections, the rods connecting each guard rail with the other sections, said guard rail sections extending in the same direction but opposite to the switch rail crank section, a rock arm mounted upon the end of the shaft and extending in the same direction as the guard rail crank sections, said arm carrying a counter-weight, substantially as set forth and described.

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