

No. 785,255.

PATENTED MAR. 21, 1905.

A. FALKNER.
FROGLASS SWITCH.
APPLICATION FILED MAY 5, 1904.

2 SHEETS—SHEET 1.

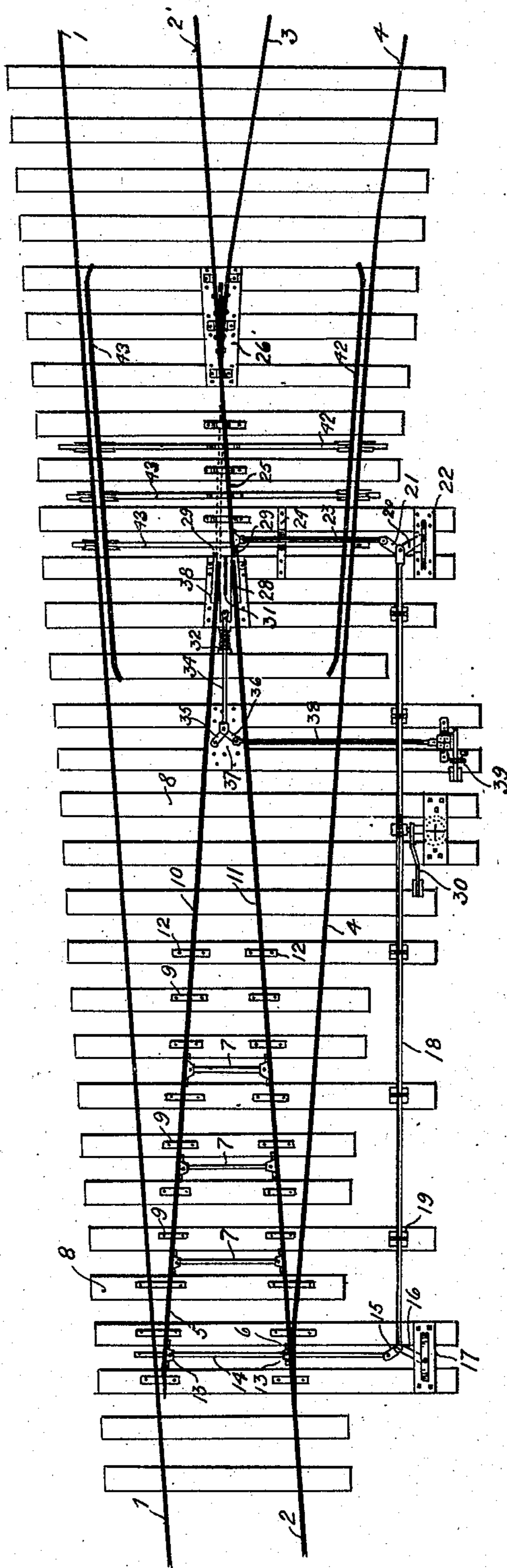


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 4.

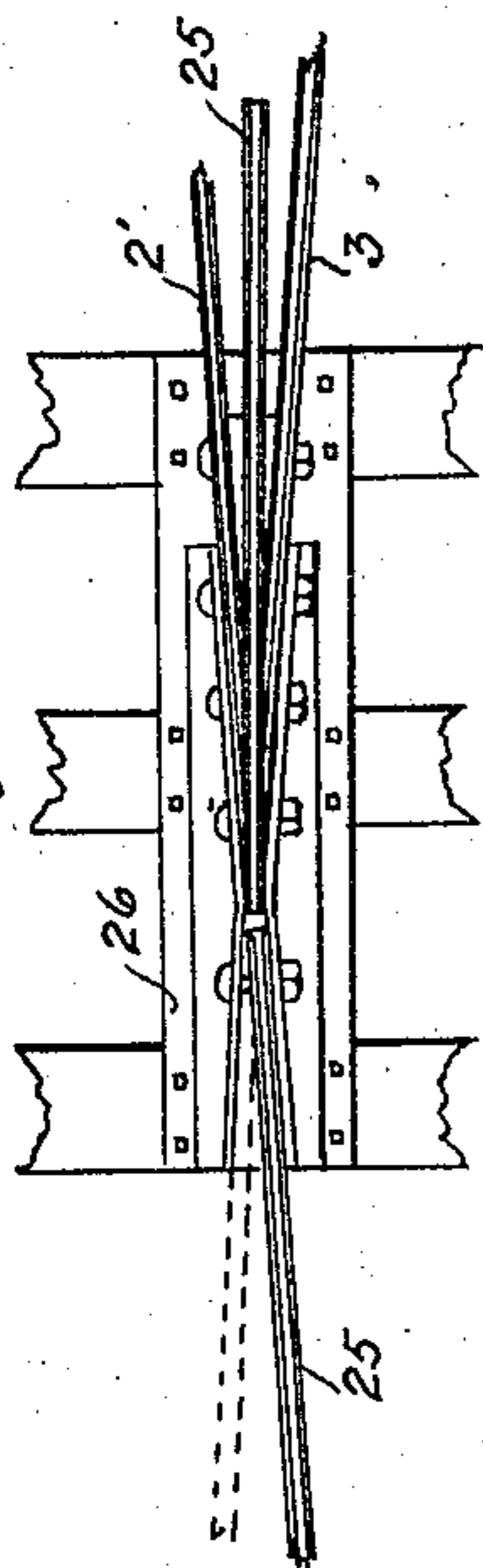


Fig. 3.

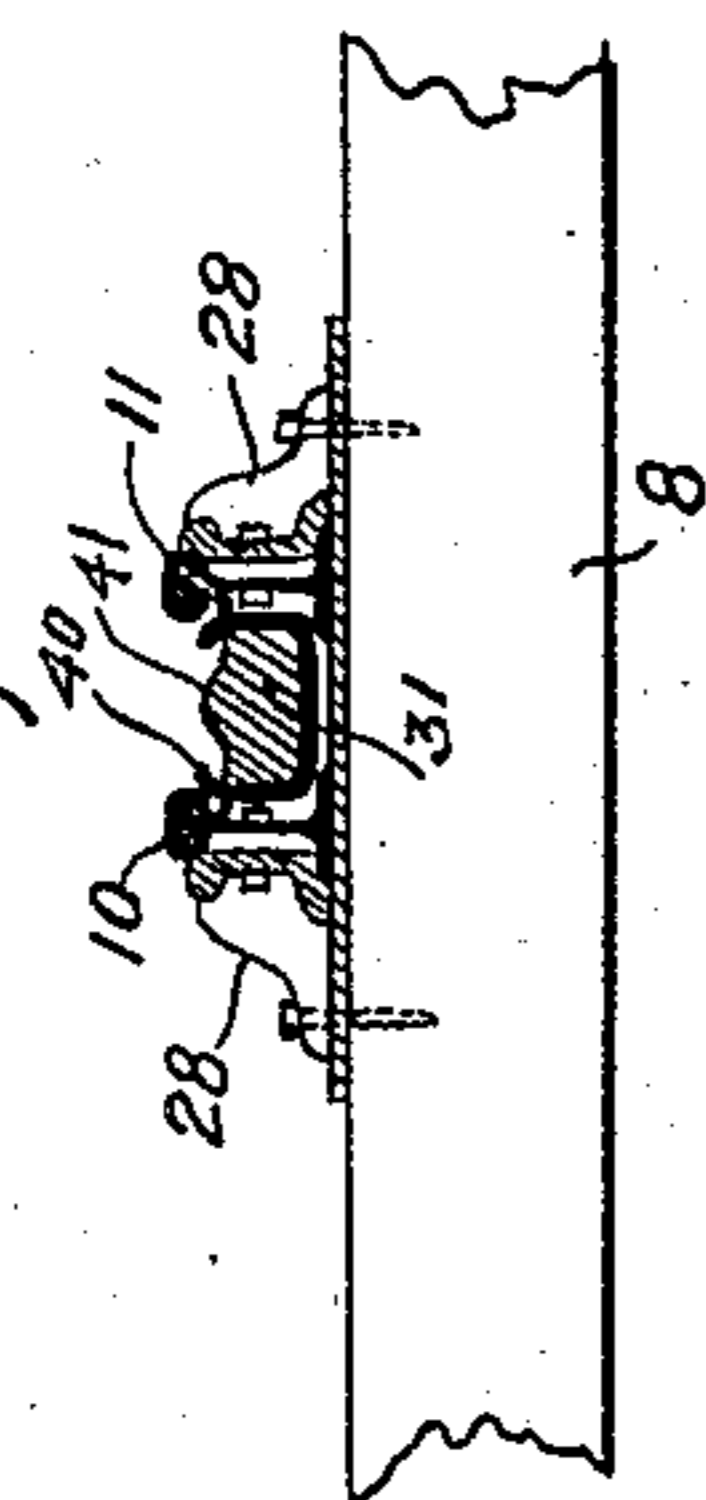
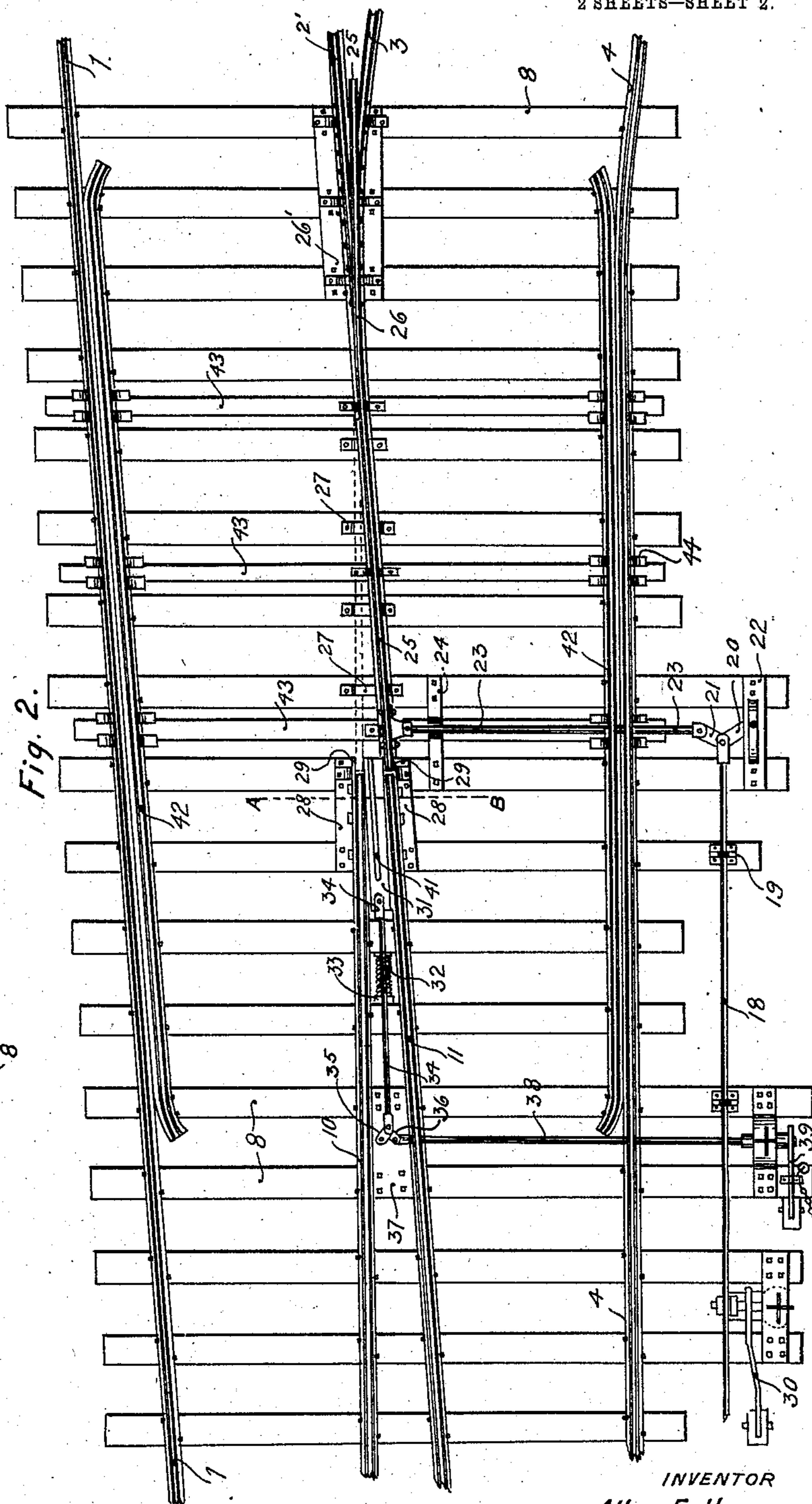


Fig. 2.



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FROGLESS SWITCH.

SPECIFICATION forming part of Letters Patent No. 785,255, dated March 21, 1905.

Application filed May 5, 1904. Serial No. 206,513.

To all whom it may concern:

Be it known that I, ALLEN FALKNER, a citizen of the United States, residing at Gate City, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Frogless Switches, of which the following is a specification.

My invention relates to an improvement in switches for railways, and has for its object to dispense with the frogs now in use and to provide as a substitute therefor a movable stub switch-rail which is independent of the expansion of abutting rails for the main and side lines and which moves to a position opposite one or the other of two stub-rails, whose other ends constitute the movable switch-points operating in the main line.

My invention further comprises a safety locking means for the switch and also the modifications in the construction and arrangement of parts hereinafter more fully described, and pointed out in the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a plan view of the complete switch mechanism. Fig. 2 is an enlarged detail plan view of the mechanism for shifting the flexible stub-rail and for shifting the switch-lock. Fig. 3 is a sectional view through the line *xx*, Fig. 2; and Fig. 4 is a modified form showing a pivoted instead of a flexed switch-rail.

Similar reference-numerals refer to the same parts throughout the drawings.

In the drawings rails 1 and 2 form part of the main line, and rails 3 and 4 lead to the siding. I provide the usual switch-points 5 and 6, which are connected together rigidly by cross-rods 7 and are supported on the cross-ties 8 in suitable guide-plates 9. These switch-points 5 and 6 are connected to the stub-rails 10 and 11, respectively, by fish-plates 12, which permit the points to have the necessary movement to open the main line or the siding. The stub-rails 10 and 11 are rigidly bolted to the ties by spikes passing through suitable holes in their base-flanges, which will prevent them crawling or being moved in any manner either by expansion of the main-line rails or pounding of the

wheels. If desired, any other more positive connection between these rails and the ties may be provided. The two switch-points 5 and 6 are bolted to clips 13, rigidly connected to a throw-rod 14, which leads under rail 1 and under the rail 2 at a point where it is bent to form a part of the rail 4 for the siding. At its outer end this rod is connected by a toggle link 15 to a pivoted link 16, connected to a plate 17, which is securely bolted to extended cross-ties. An operating-rod 18, disposed parallel with the track and mounted in suitable guides 19 on the ties, is connected at one end to the two toggle-links 15 and 16 and at its other end to a reversely-disposed pair of toggle-links 20 and 21, which connect, respectively, to a plate 22 and to the outer end of a throw-rod 23, which leads under rail 4, being suitably supported on a bent-metal strap 24, provided with flanges which rest upon two adjacent ties and are securely bolted thereto. This rod 23 is rigidly connected to the inner end of the stub switch-rail 25, which at its outer end is bent slightly at 26 and for a portion of its length is rigidly bolted to the ties to prevent any possibility of it crawling or moving, due to expansion or wear. This connection is preferably the same as that described for the rails 10 and 11 only in view of the fact that it must stand more wear and tear the connections should be even stronger. It will be noted that the inner end of this rail is free to be flexed by the throw-rod 23, for which purpose it is freely supported on the ties, which have stops or guide-plates 27 suitably connected thereto and adapted to hold the rail in one of its two operating positions. The rail 2' is provided with an end cut diagonally and adapted to abut against rail 25 at the point 26 without, however, being directly connected thereto. The rail 2' thus forms a permanent and substantial joint with the switch-rail and constitutes a continuation of the main-line rails. It will, however, be noted that I do not directly connect the rail 2' to the rail 25, as this would make the latter sensitive to the expansion movement of the main-line rails, which objectionable feature it is my intention to particularly avoid, as it might prevent the switch-rail acting freely.

The rail 3 for the siding abuts in the same manner against the other side of the rail 25 and at a point slightly in advance of rail 2' and likewise forms a loose connection, by means of which the rail 3 as it expands will move along rail 25 without tending to shift the latter or affect the joint.

I provide suitable guides or stops 26', which cause the edges of the ends of rails 2' and 3 to hug rail 25 closely and at the same time permitting them to move the necessary distance to compensate expansion and contraction.

By thus making my switch-rail independent of the expansion in its movements I greatly increase its reliability without incurring any interference with its operation. The stub ends of the rails 10 and 11 are suitably mounted in bearing-plates 28, which have flanges 29 extended beyond the ends of the rails 10 and 11 to serve as stops for the stub end of the rail 25 to limit its throw and stop it in alinement with either of said rails. It will be noted that the rail 25 in its normal or unflexed position is disposed opposite to the rail 11, in which condition the main line will be open. If it is desired to throw the switch to open the siding, this will be effected by throwing the lever 30, which operates the rod 18 and moves the switch-points 5 and 6 into alinement with the rails leading to the siding and at the same time flexes the rail 25, so that the train will run freely onto the siding.

To provide against possible movement of the rail 25 and to lock it firmly in one or the other of its operating positions, I provide a spring-pressed tongue 31, disposed between the stub ends of the rails 10 and 11 and adapted to slide between the ends of said rails for a distance of several inches. A coiled spring 32, disposed between the outer end of this tongue and a stop 33, mounted on a cross-tie, tends to force the tongue into the position shown in Fig. 2, where it will be noted that the end of the switch-rail will be securely locked against movement between tongue 31 and one of the flanges 29. In this position the switch is set for the passage of trains along the main line, and if it is desired to open the siding it will be necessary to first draw the end of the tongue 31 inwardly beyond the ends of the rails 10 and 11 and then to throw the rod 18 to flex the rail 25 and shift the switch-points 5 and 6 into their positions, when the train will pass into the siding. If then the tongue 31 be again moved inwardly, the rail 25 will be locked in the position shown in dotted lines, Fig. 2, and the switch set for the siding. My preferred mechanism for operating this locking-tongue comprises a rod 34, connected to toggle-links 35 and 36, mounted on a plate 37, secured to the cross-ties. An end of the link 36 is connected to a throw-rod 38, leading under the

rails 11 and 4 and operated by a lever 39. I consider it preferable to lock the lever 39 instead of the lever 30, and it is my intention to dispose these two levers at adjacent points, where they can be readily operated at the same time. The coil-spring 32 surrounds rod 34, for which the stop 33 serves as a guide.

I provide suitable guides 40 for the tongue 31, which are bolted to the rails 10 and 11, and this tongue may have a central flange or lug 41 to guide the wheels onto the switch-rail 25.

If desired, I may substitute for an integral switch-rail one having the movable stub end connected thereto by a fish-plate, as illustrated in Fig. 4.

Suitable guard-rails 42 are disposed on each side opposite to the switch near rails 1 and 4. To prevent any tendency of rail 25 to spring upwardly when the engine strikes its other end, I provide cross-bars 43, rigidly connected to the bottom flange of rail 25 and adapted to slide in guides 44, secured to rails 1 and 4 and disposed between ties.

The operating mechanism for the switch points and rail may be varied at will and even combined, so that they may be operated from one lever. Also the spring for the tongue may be dispensed with and the other features varied without departing from my invention, which comprises as its gist the use of a movable stub switch-rail which is independent of both main and side line rails and which is securely locked in alinement with one of the two stub-rails connected to the switch-points.

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

1. In a frogless switch, the combination of main and siding rails and intermediate fixed rails, of a movable switch-point to connect with one or the other of said fixed rails and complete the main or siding rails, a spring-pressed locking device to hold said movable switch-point in one or the other of its operating positions, and means to shift said locking device.

2. In a frogless switch, the combination of main and siding rails and two cross-switch rails, of a flexible switch-rail having a movable portion adapted to complete the main or siding rails when disposed opposite one or the other of said cross-rails, a locking-tongue disposed between said cross-rails and adapted to lock said single switch-rail in alinement with one of said cross-rails, and independent means to actuate said tongue and lock it so as to set the switch.

3. In a frogless switch, the combination of main and siding rails, of intermediate switch-rails one of which is movable relative to the other two, means to lock said movable rail in alinement with one of said other

switch-rails, a spring to normally hold said means in its operating position, and actuating means to move said locking means.

4. In a switch, the combination with rails for the main line and siding, of switch-points terminating in two adjacent stub-rails, a flexible stub switch-rail, and a sliding tongue disposed between said stub-rails to hold said switch-rail in alinement with one of said stub-rails.

5. In a switch, the combination with rails for the main line and siding, of switch-points terminating in two adjacent stub-rails, a movable stub switch-rail, guides disposed between said stub-rails, a longitudinally-shouldered plate movable in said guides and adapted, in its normal operating position to engage said movable rail to hold it in alinement with one of said stub-rails, said plate being adapted to serve as a guard-rail for the switch-joint.

6. In a switch, the combination with rails for the main line and siding, of double switch-points engaging one or the other of said main-line rails and terminating in fixed stub-rails between the outer rails of main and siding lines, a stub switch-rail, a sliding joint between the inner rails of the main and siding lines and said switch-rail, and means to shift said latter rail opposite one or the other of said fixed stub-rails according to the position of said switch-points.

7. In a switch, the combination with main and side line rails, of two movable switch-points, two fixed stub-rails connected to or forming a continuation of said points, and a movable stub-rail adapted to assume positions in alinement with one of said fixed stub-rails and to be free of a positive connection to rails of either the main or side line which abut against it.

8. In a switch, two switch-points, two stub-rails forming continuations of said points and terminating adjacent to each other between the outer rails of main and side lines, a flexible stub switch-rail rigidly mounted on the rail-supports at its outer end, means to bend the free end of said switch-rail into alinement with one of said stub-rails, stops disposed in advance of and adjacent to outside ends of said two stub-rails and adapted to limit the throw of said flexible rail, a movable locking device disposed between said two stub-rails and adapted in its locking position to extend in advance of them to lock said flexible switch-rail in alinement with one or the other of said stub-rails, and inner rails of the main and side lines which engage said switch-rail.

9. In a switch, main and side line rails, switch-points, intermediate rails and a switch-rail connecting said main and side line rails,

an expansion-joint between said latter rails and said switch-rail, and means to shift said switch-rail and switch-points together.

10. In a switch, main and side line rails, switch-points, intermediate rails and a switch-rail connecting said main and side line rails, an expansion-joint between said latter rails and said switch-rail, means to shift said switch-rail and switch-points together, and a movable tongue to lock said switch-rail in its operating positions.

11. In a switch, main and side line rails, switch-points, intermediate rails and a flexible switch-rail connecting said main and side line rails, said switch-rail being connected to the proper main and side line rails by an expansion-joint which makes it insensible to the movement of said rails.

12. In a switch, main and side line rails, switch-points, intermediate rails and a flexible switch-rail connecting said main and side line rails, said switch-rail being connected to the proper main and side line rails by an expansion-joint which makes it insensible to the movement of said rails, means to secure one end of said flexible rail rigidly to the rail-supports to prevent its crawling, and guide-plates for its flexing end.

13. In a frogless switch, the combination with main and siding rails, intermediate switch-rails, one of which is movable relative to the other two, of means to lock said movable rail in alinement with one of said other switch-rails, said locking means comprising a movable element adapted to serve as a guard-rail for the joint between the intermediate switch-rails.

14. In a frogless switch, the combination with main and side line rails, of two movable switch-points, two fixed stub-rails connected to or forming a continuation of said points, a movable stub-rail adapted to assume positions in alinement with one or the other of said fixed stub-rails, means to simultaneously shift said switch-points and movable stub-rail to set the switch for the main line or the siding, a sliding tongue to lock said movable stub-rail in one of its switching positions, spring means tending to move said tongue to its locking position, and means to operate and lock said tongue independently of said switch-operating means.

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

ALLEN FALKNER.

Witnesses:

R. D. JOHNSTON,
R. H. KERR