

No. 674,968.

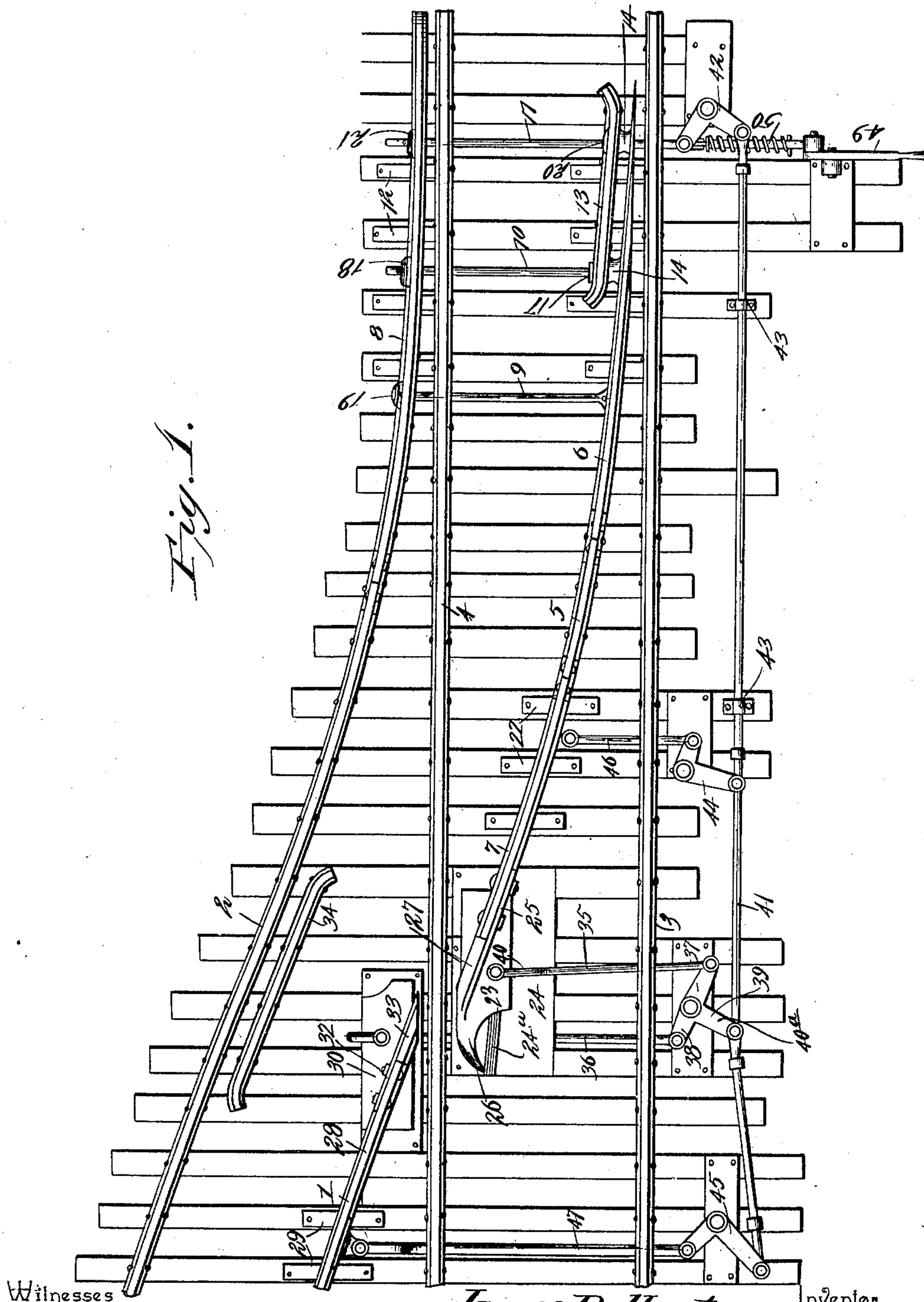
Patented May 28, 1901.

J. R. HARTMAN.
RAILWAY SWITCH.

(Application filed July 31, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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James R. Hartman, Inventor

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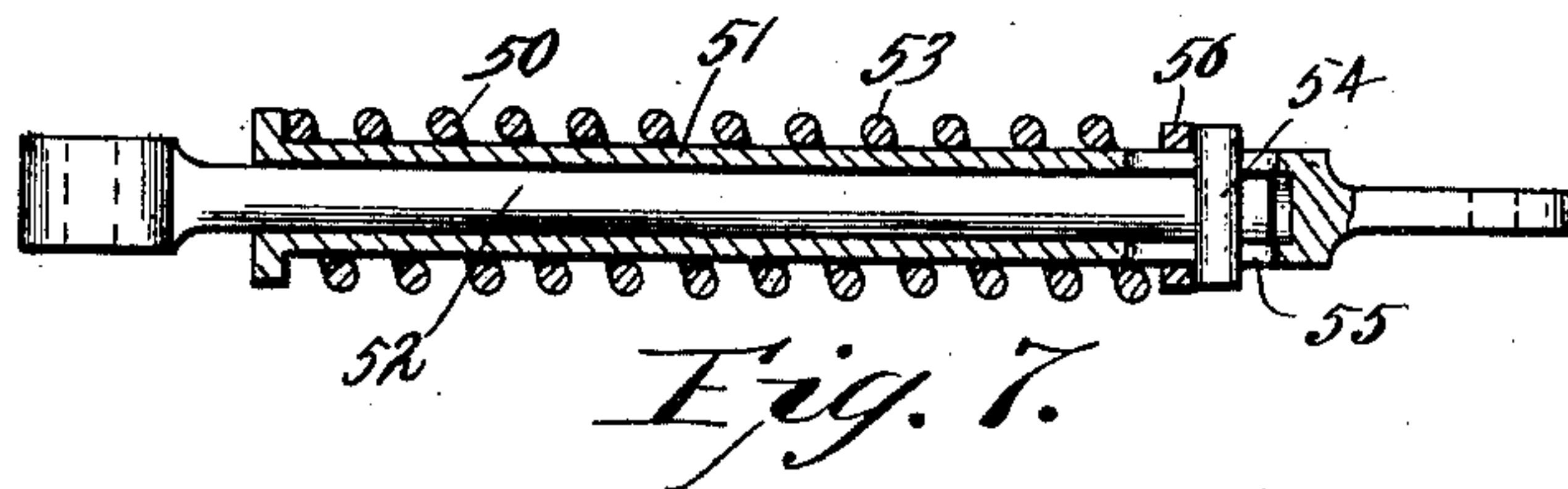
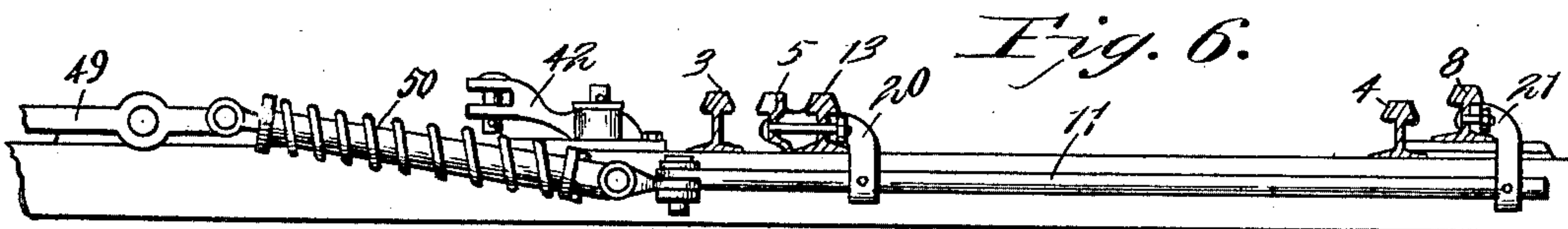
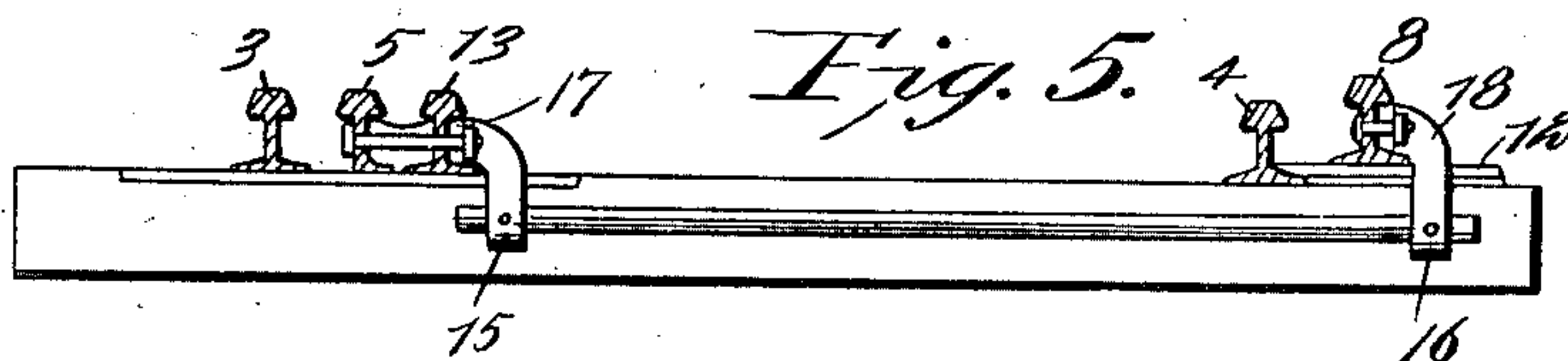
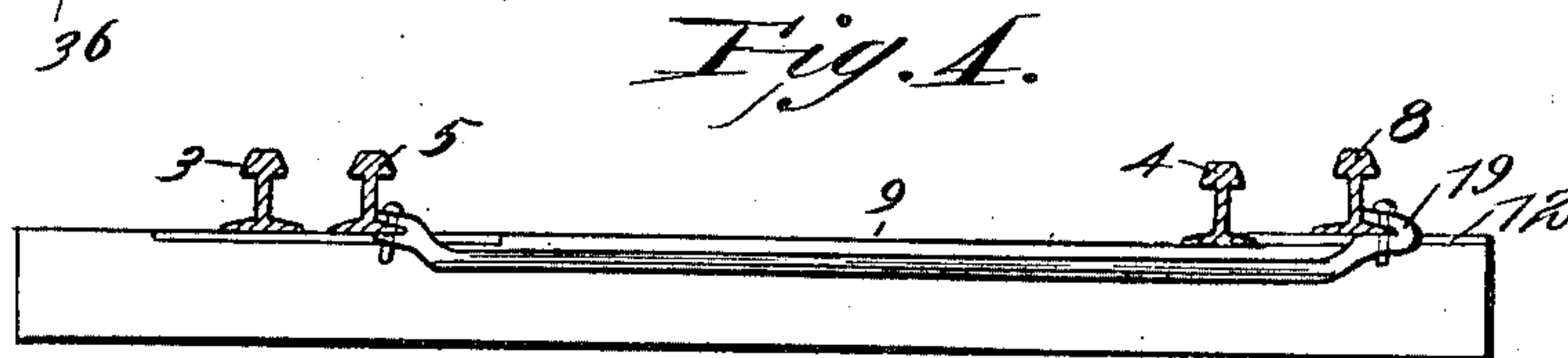
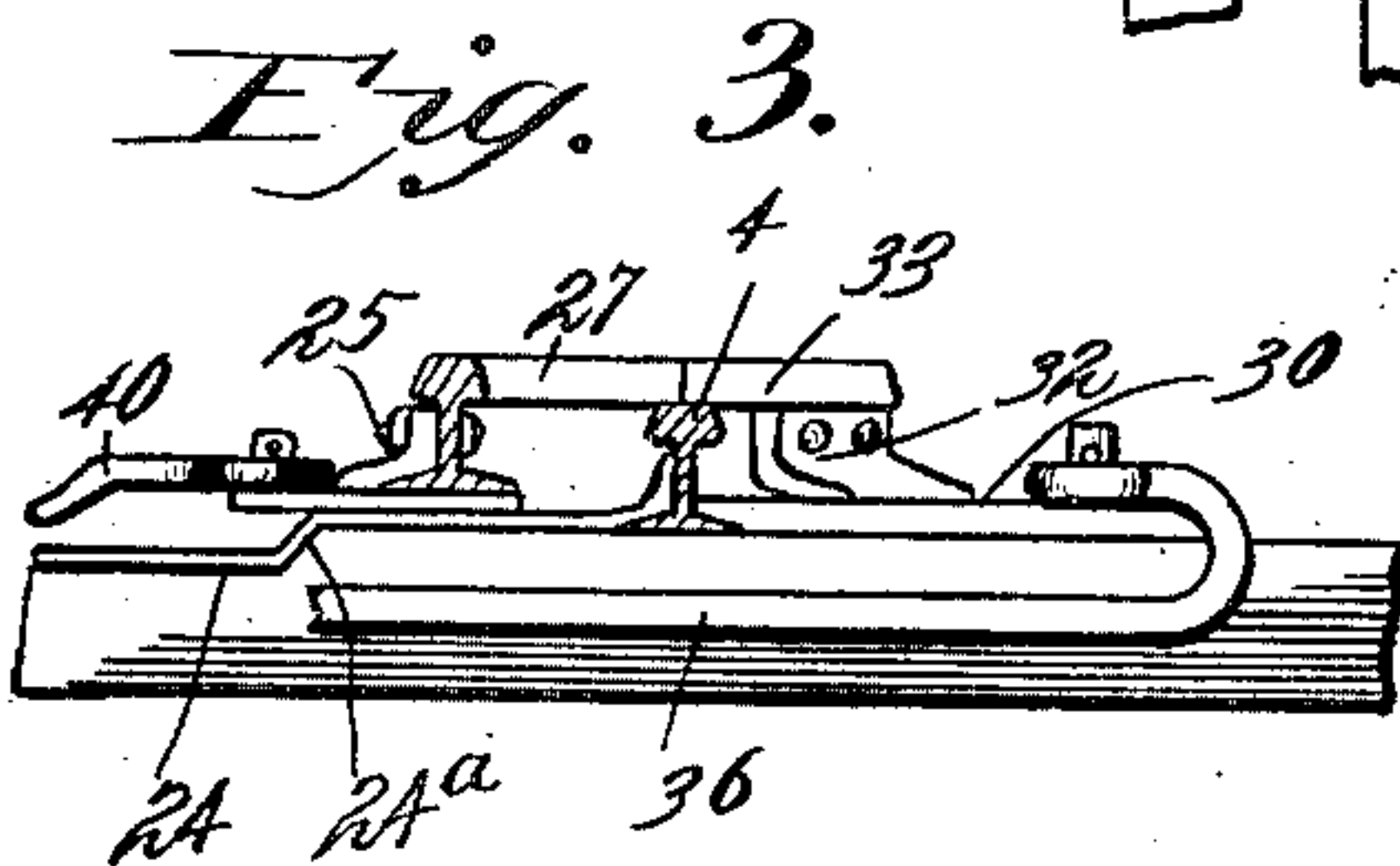
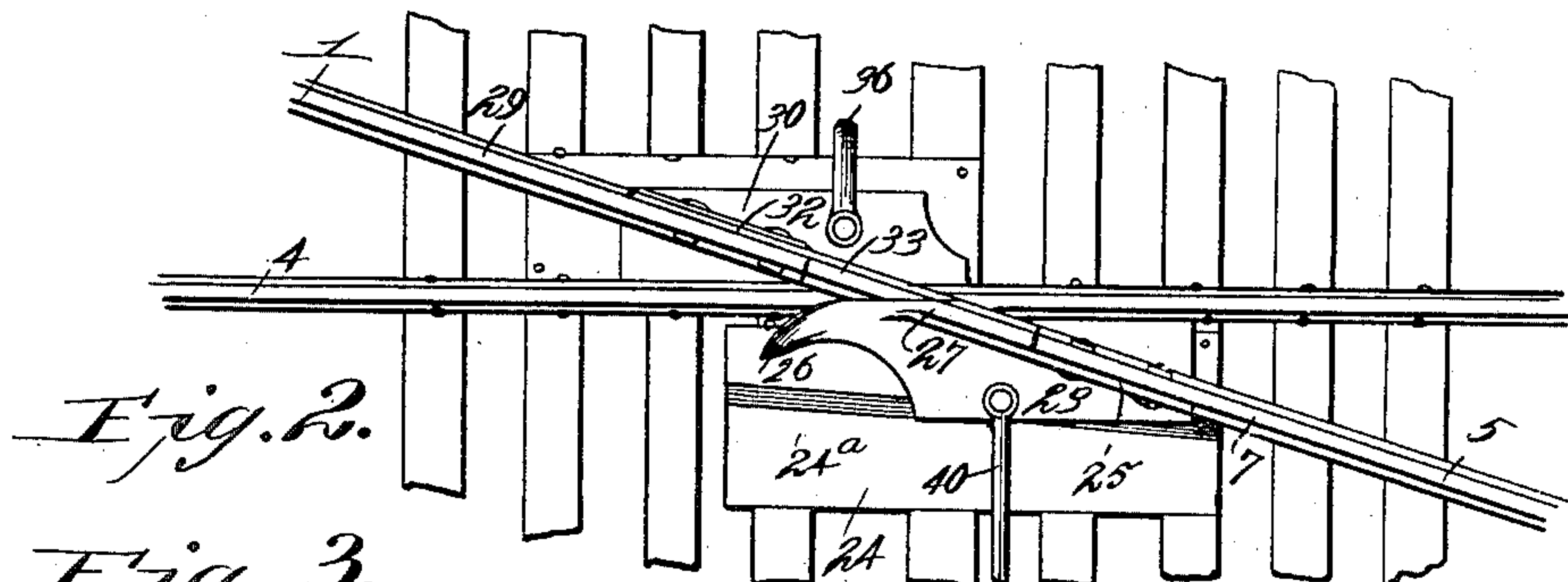
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JAMES R. HARTMAN, OF COLORADO SPRINGS, COLORADO.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 674,968, dated May 28, 1901.

Application filed July 31, 1900. Serial No. 25,449. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. HARTMAN, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and useful Railway-Switch, of which the following is a specification.

The invention relates to improvements in railway-switches.

One object of the present invention is to improve the construction of railway-switches and to provide a simple and comparatively inexpensive one adapted to enable continuous main rails to be employed, and thereby prevent the jar and vibration incident to the passage of a train over worn points and at the same time to render the safety of a train as great at a switch as at any other place.

Another object of the invention is to provide a switch of this character adapted to carry the flanges of the car-wheels over the main rails and capable when arranged for this purpose of permitting a train on the main track or line to open it automatically and pass it without injuring any of the connections.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a plan view of a switch constructed in accordance with this invention and shown open. Fig. 2 is a plan view of a portion of the switch, the latter being closed. Fig. 3 is a detail sectional view of the same. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 1. Fig. 5 is a similar view on the line 5 5 of Fig. 1. Fig. 6 is a transverse sectional view on line 6 6 of Fig. 1. Fig. 7 is an enlarged detail sectional view illustrating the construction of the yielding connection at the operating-lever to permit the switch when closed to be automatically opened by a train on the main line.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 and 2 designate inner and outer siding-

rails, located at one side of the main rails 3 and 4, and the inner siding-rail 1 is adapted, as illustrated in Fig. 2 of the accompanying drawings, to partially overlap the main rail 4 and form a continuation of a switch-rail 5, which is located between the main rails 3 and 4. The switch-rail 5 is provided with laterally-movable portions 6 and 7, located, respectively, adjacent to the main rails 3 and 4 and having their terminals beveled, as clearly shown in Fig. 1. The laterally-movable end portion 6 of the switch-rail 5 is connected with the movable portion 8 of the outer siding-rail 2 by transverse connecting-rods 9, 10, and 11, and it has a long gradual taper and is adapted when closed to lie along the inner face of the main rail 3. The movable portion 8 of the outer siding-rail 2 is provided with an inclined tread and is adapted to lift the wheels and carry the flanges thereof clear of the main rail 4, and the said movable portion 8 is slidingly mounted on blocks 12, having their upper faces arranged at different elevations to properly grade the movable portion 8. The blocks 12, which are provided with flat upper faces, are secured to the upper faces of the adjacent cross-ties. The movable end portion 6 of the switch-rail is provided at its outer side with a short guard-rail 13 to prevent the wheels from being thrown over too far by the switch-rail, and this guard-rail, which has slightly-curved ends, is connected adjacent to the same with the switch-rail by webs or blocks 14. The blocks 14, which are interposed between the guard-rail 13 and the switch-rail 6, are perforated for the reception of bolts or other suitable fastening devices, which pass through the rails 6 and 13 at the wedge thereof. The transverse connecting-rod 10, which is located beneath the rails, is secured at its ends to depending arms 15 and 16 of plates 17 and 18, which are secured, respectively, to the guard-rail 13 and to the movable portion 8 of the outer siding-rail 2, and the plate 17 is secured by the fastening devices of the adjacent block 14. The transverse rod 9, which is clearly illustrated in Fig. 4 of the accompanying drawings, has its inner end forked and secured to the switch-rail 5, and its outer end 19 is provided with a hook

for engaging the outer siding-rail 2. The transverse rod 11 is connected with the guard-rail and the movable portion of the outer siding-rail by plates 20 and 21, having depending arms similar to the plates 17 and 18. The transverse rod 11 is extended beyond the main rail 2 and is connected with the operating mechanism, hereinafter explained, and is adapted to cause the movable portions 6 and 8 of the rails 5 and 2 to open and close simultaneously.

The movable portion 7 of the switch-rail 5 is arranged upon blocks 22, secured to the cross-ties and having their upper faces arranged at different elevations to grade the switch-rail and enable the same to elevate the car-wheels and carry the flanges thereof over the main rail 4, and the movable portion 7 is also secured at its outer terminal to a shoe 23, arranged to slide on a plate 24. The plate 24, which is secured to the adjacent cross-ties, is preferably constructed of steel, and the shoe, which is provided with a supporting-flange 25, has a curved arm or extension 26, for a purpose hereinafter explained. The switch-rail 5 is secured to the supporting-flange 25 by bolts, and the shoe is preferably provided with an integral rail-section 27, which constitutes the end of the switch-rail and which is adapted to be carried over the main rail 4 by the shoe. The curved arm or extension 26 of the inner shoe is arranged at an angle to the main rail 4 and is adapted to be engaged by the wheels of a train when the switch is closed to permit a train on the main line to open the switch automatically when traveling in the direction of the arrow in Fig. 1. By this construction a train is permitted to pass the switch when the latter is closed and there is no liability of a train being derailed by the switch and trains are enabled to travel rapidly with perfect safety.

The upper face or tread of the curved arm or extension 26 is inclined and extends downward to the outer end or point of the said arm or extension. In order to prevent the shoe 23 from extending above the plane of the treads or upper faces of the main rails when the main line is open, the plate 24, on which the shoe 23 slides, is provided with an inclined portion 24^a, and the shoe is adapted to slide up and down the same. That portion of the plate 24 adjacent to the main rail 4 is higher than the portion at the opposite edge of the plate, and when the shoe is moved laterally it is carried up and down the incline and is automatically raised and lowered. When it is supported on the lower portion of the plate 24, it lies below the plane of the treads or upper faces of the main rails and offers no obstruction to the passage of a train. The movable portions of the rails may be connected with the adjacent fixed portions by hinge-joints or any suitable connection which will permit the necessary play of the movable portions, and the number of the grading-blocks may be varied.

The curved extension or arm of the inner shoe tapers in width and in height, and it is adapted when the switch is closed to be engaged by the wheels of a train to open the switch automatically, and this double taper of the curved arm or extension enables such contact to be effected without producing any material jarring or jolting of the train, and there is no liability of a car being accidentally derailed should its wheels come in contact with the curved arm or extension when a train is traveling at a high rate of speed.

The inner siding-rail 1 is provided with a movable portion 28, arranged upon blocks 29 and connected with an outer shoe 30, which is mounted on the plate 31, similar to the plate 24, heretofore described. The shoe 30, which is located outside of the main rails, is provided with a supporting-flange 32 and has an integral end section 33, constituting the end of the movable portion of the rail 1 and adapted to overlap the main rail 4, as clearly illustrated in Fig. 2 of the accompanying drawings, to form a continuation of the switch-rail. The switch-rail elevates the car-wheels and carries the flanges thereof over the main rail 4, and the blocks 29, which grade the movable portion 28 of the inner siding-rail 1, gradually decrease in height from the main rail 4. A short guard-rail 34 is secured to the cross-ties at a point opposite the movable section 28 of the siding-rail 1 to hold the wheels on the outer siding-rail and to relieve the movable section or portion 28 of lateral strain.

The inner and outer shoes are connected by rods 35 and 36 with the arms 37 and 38 of a double bell-crank lever 39, whereby when the latter is oscillated by the means hereinafter described the inner and outer shoes will be moved in opposite directions to open and close the rails 1 and 5 simultaneously. The rods 35 and 36 extend beneath the rails, and the inner end 40 of the rod 35 is bent upward and is secured to the upper face of the inner shoe, as clearly illustrated in Fig. 3 of the accompanying drawings. The inner end of the other rod 36 is hook-shaped and extends upward over the outer portion of the outer shoe and is secured to the same. The other arm 40^a of the double bell-crank lever is connected with a reciprocating rod 41, arranged longitudinally of the main rail at the outside of the rail 3 and pivoted to one arm of a bell-crank lever 42. The reciprocating rod 41, which is preferably constructed of tubular metal, such as gas-pipe, is mounted in guides 43, and the cross-ties are extended at intervals to support the guides. The movable portions 7 and 28 of the rails 5 and 1 are also connected with the reciprocating rod 41 by bell-crank levers 44 and 45 and transverse connecting-rods 46 and 47, arranged as illustrated in Fig. 1 of the accompanying drawings and adapted to insure a positive and easy movement of the rails. The bell-crank lever 44 is fulcrumed on a suitable plate, and the transverse con-

necting-rod 46 extends from one of the arms of the bell-crank lever 44 beneath the main rail 3 to the movable section 7 of the switch-rail 5, and the other arm of the bell-crank lever 44 is connected with the reciprocating rod 41. The bell-crank lever 44 is arranged at one side of the double bell-crank lever, and the bell-crank lever 45 is located at the opposite side of the same and is connected with the arm 40^a thereof by a rod or section 48, forming a continuation of the reciprocating rod 41. The connecting-rod 47 extends beneath the main rail and is pivoted at one end to the movable portion 28 of the siding-rail 1, and its other end is arranged at the outer side of the main rail 3 and is connected with the said bell-crank lever 45. The movable portions 7 and 28 are provided with plates having ears for the reception of the pivots of the connecting-rods 46 and 47.

The bell-crank lever 42 has one of its arms connected with the reciprocating rod 41, and its other arm is connected with the adjacent end of the transverse connecting-rod 11. The extended end of the transverse connecting-rod 11 is connected with an operating or switch lever 49 by a resilient connection 50, which is adapted to yield to permit the switch when closed to be opened automatically by a train on the main line traveling in the direction of the arrow of Fig. 1. The switch-operating lever 49, which is of the ordinary construction, is fulcrumed between its ends on a suitable switch stand or support, and the resilient yielding connection 50 comprises a tube 51, a rod 52, telescoping into the tube, and a coiled spring 53, disposed on the exterior of the tube and connected with the same and with the rod. The opposite ends of the tube and the rod are provided with eyes located at the terminals of the connections and adapted to receive the pivots or fastening devices for securing them to the adjacent parts. The inner end of the tubular section of the connection is provided with a flange to engage the adjacent end of the coiled spring, and the inner end of the rod is provided with a pin or key 54, extending through longitudinal slots 55 of the tube 51 and adapted to be engaged by the other end of the coiled spring; but a ring 56 is preferably interposed between the coiled spring and the ends of the pin or key. The coiled spring is adapted to be compressed between the pin or key 54 and the flange 57 of the tubular section or member. The coiled spring, which is normally distended, is more or less compressed when the switch-lever 49 is oscillated, and it relieves the operator of strain, besides operating to permit the switch to be opened by a train on the main line without breaking, straining, or otherwise injuring the various connections between the rails.

It will be seen that the switch is adapted to permit the use of continuous unbroken main rails and that all the danger of derailments, jars, and vibrations resulting from the con-

tact of the wheels of a train with worn points of frogs is prevented and that a train is as safe while passing over switches as it is when traveling over any other portion of a track. Furthermore, it will be clear that by the construction herein shown and described there is no danger of the sharp flanges of wheels coming in contact with the points of frogs and that there is no wear on the parts of the switch except when the same is in actual use and that when the switch is in use the wear on the parts is no greater than the wear on ordinary rails. Also it will be clear that as the switch is adapted to be opened automatically by the wheels of a train on the main line trains may with perfect safety travel with greater rapidity and that the pounding of the wheels over frogs is obviated and the cost of travel and the annoyance incident to such pounding action of the wheels are lessened and that the switch may be put in at any point on the main track without cutting the rails or otherwise disturbing them.

What I claim is—

1. In a switch, the combination of the main rail, the switch-rail having the movable section 7, the inner sliding shoe provided with an integral rail-section and having the longitudinal supporting-flange extending from the inner end of the rail-section and secured to the adjacent end of the movable section 7 of the switch-rail, said inner shoe being provided with a curved arm tapering toward its outer end and presenting an inclined upper face, and means for operating the inner shoe, substantially as described.

2. In a switch, the combination of the main rails, 3 and 4, the switch-rail 5 having the movable portions 6 and 7, the inner shoe provided with an integral rail-section and having the longitudinal supporting-flange extending from the inner end of the rail-section and secured to the movable portion 7, said inner shoe being provided with a curved arm tapering toward its outer end and presenting an inclined upper face, the inner and outer siding-rails provided with movable portions, the inner siding-rail being provided with a shoe having a rail-section, plates supporting the inner and outer shoes, the plate supporting the inner shoe being provided with an inclined portion, and means for operating the rails, substantially as described.

3. In a switch, the combination of the main rails 3 and 4, the switch-rail 5 having the movable portions 6 and 7, the inner shoe provided with the longitudinal supporting-flange and having the tapering arm presenting an inclined upper face and curved from the main rail 4, the inner and outer siding-rails having movable portions, a sliding shoe connected with the movable portion of the inner siding-rail, and means for operating the movable portions of the rails, said means being provided with a yielding connection comprising the tubular member provided at one end with

a stop and having a slot at its other end, the rod arranged within the tubular member and provided with a key extending through the slot, and a coiled spring arranged on the exterior of the tubular member and interposed between the stop and the key, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES R. HARTMAN.

Witnesses:

W. O. ANTHONY,
W. J. McALLISTER.