(No Model.)

D. M. CHURCH.

RAILWAY SWITCH.

No. 522,951. Patented July 10, 1894.

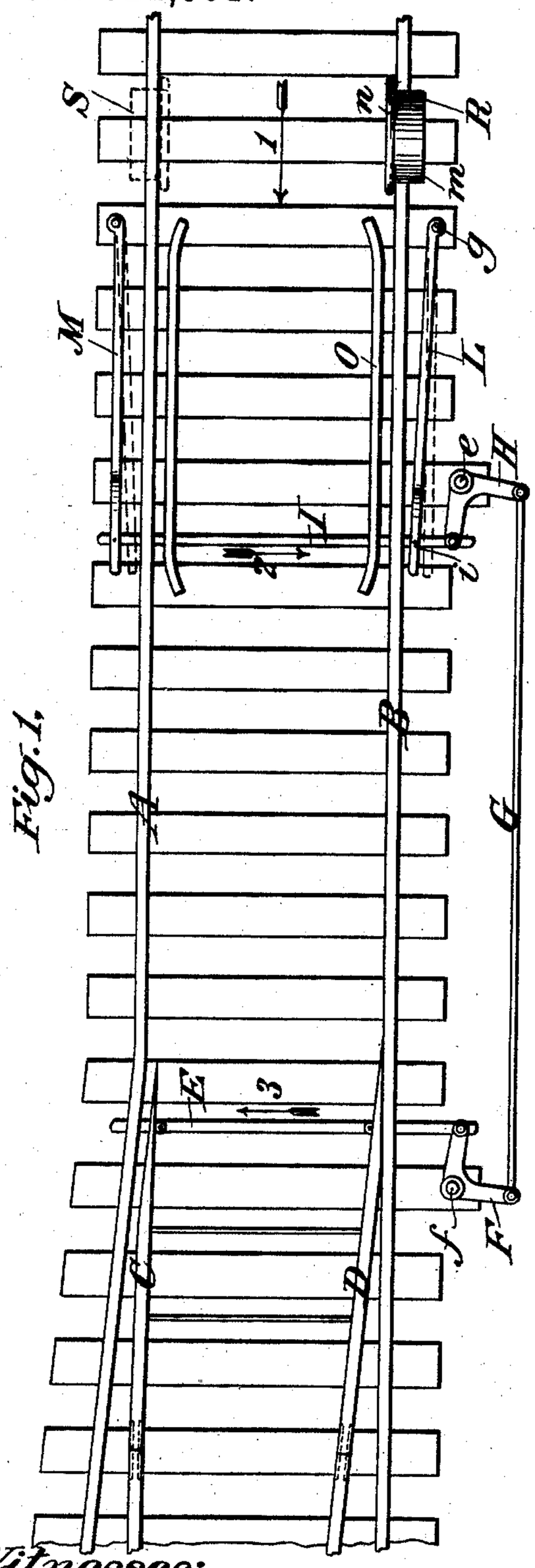

Fig. 1.

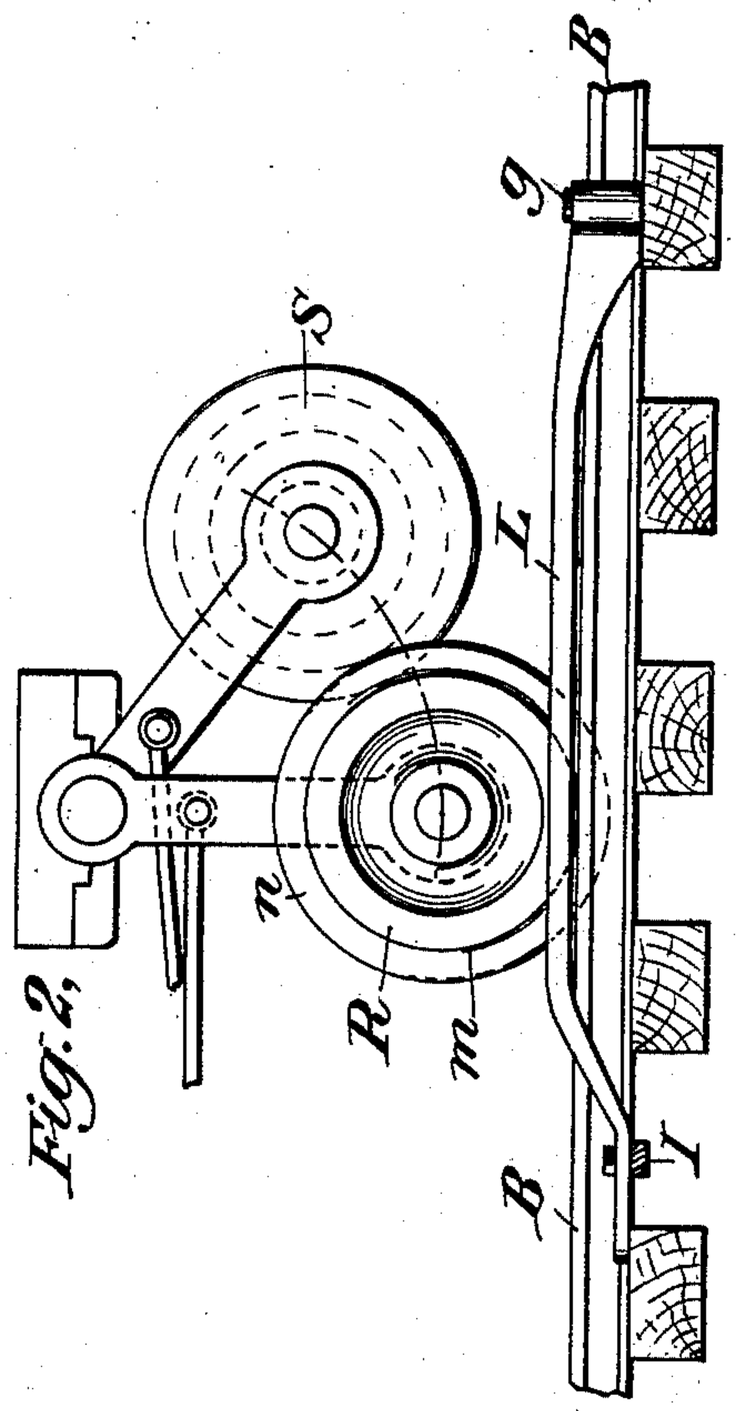

Fig. 2.

Witnesses:-

D. F. Hayhurst

H. E. Eastman

Inventor:-

D. M. Church

by atty

D. N. M. Sinclair

UNITED STATES PATENT OFFICE.

DWIGHT M. CHURCH, OF WILLIMANTIC, CONNECTICUT, ASSIGNOR OF TWO-THIRDS TO EDGAR B. FOSS, OF BAY CITY, MICHIGAN, AND ARTHUR C. ANDREW, OF WINDHAM, CONNECTICUT.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 522,951, dated July 10, 1894.

Application filed October 18, 1893. Serial No. 488,483. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT M. CHURCH, of Willimantic, in the county of Windham and State of Connecticut, have invented a certain new and useful Improvement in Railway-Switches; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that well-known type of railroad switch mechanism in which some sort of device on the engine, or locomotive, operates to actuate the switch and set it in the proper or desired position, before the engine shall have reached it.

Previous to my invention many switch mechanisms, of the type alluded to, have been devised and patented, some of which patents have been granted to myself, but I am not aware of any of these heretofore devised, automatic, contrivances, having gone into successful operation, on rail-roads, to any extent; and I understand that few of such previously known mechanisms are thoroughly practical and, hence, desirable in use.

I propose, by my present invention, to provide for use a switch mechanism of the type above alluded to which, while it shall be exceedingly simple, and hence, not liable to get out of perfect working order, shall be positive, or certain, in its designed operations, easy of control by the locomotive engineer; and, at the same time, durable, economic of construction, and not adapted to inflict any unnecessary wear and tear on the road to which it may be applied, or to the rolling stock thereof.

To these main ends and objects my invention may be said to consist in the novel construction of automatic switch mechanism which will be found hereinafter fully described, and which will be found most particularly pointed out and defined in the claim of this specification.

To enable those skilled in the art to readily understand and practice my invention, I will now proceed to more fully describe it, referring by letters to the accompanying drawings which form part of this specification, and in which I have shown my said improvement carried into effect in that precise form in which I have so far practiced it, though it may, of course, be practiced under various modifications of the detailed construction shown.

In the drawings, I have shown at Figure 1 a plan, or top, view of so much of a railroad track as is necessary to be exhibited, in order to illustrate my improved switch mechanism as applied thereto. Fig. 2, is a diagrammatical view showing some of the parts in side view, and illustrating the movements of the actuating devices attached to the locomotive.

In the drawings A, and B, are the rails of the main track and C, D, the switch rails, or switch-points of a siding, which, in the case shown, happens to branch off to the right from the main track. The switch-points, or the movable ends of the rails, C, D, of the siding, are, as usual, secured to a bar E which runs transversely of the track and is adapted to slide (in the direction of its length), beneath the rails A, B, and to which is connected some sort of mechanism for moving said slide E, for the purpose of setting the switch-rails to either open, or close, the switch to either the main track, or the siding; in a well known manner. In the case shown, the means connected with this usual slide E, to move it as may be necessary, consists of a bell-crank F, turning on a fixed fulcrum at *f*, and having one of its arms pivoted to slide E, and the other to one end of a connecting rod, as shown; a connecting rod, or draft-bar G; and another bell-crank H, having a fixed fulcrum at *e*, and having one arm pivoted to said connecting rod and the other to a bar I, which, like the one marked E, is arranged transversely of the main track and is adapted to slide beneath it; all as clearly illustrated in the drawings.

The sliding bar I is moved, in one, or the other, direction as occasion may require, by one, or the other, of two shifting-rails L, and M; each of which is located outside of, or at one side of, the main track and is arranged and actuated as I will now explain. As these shifting-rails and the parts directly connected with each, as well as the devices on the en-

gine, for moving said rails, are duplicates, an explanation of how one set of these devices is made and works will suffice for both.

The shifting rail, or bar L, is hung at one end on a stationary vertical pivot *g*, and is pivotally connected at *i*, to the slide I, and said bar L is made, or arranged, so that its top surface will lie in a plane somewhat higher than that in which lie the top surfaces of the track rails A, B; for a purpose to be presently described.

Inside of the main rail B, and arranged parallel therewith, as shown, is a guard-rail O; which, though made and arranged in a manner common to guard-rails, performs a rather unusual, or somewhat different, function; as will be presently explained.

R, is a wheel which is hung in the lower end of a swinging arm, or hanger, which is hinged to the lower portion of the engine frame, said wheel being thus adapted to be brought down on to the rail B, and lifted clear thereof, at the pleasure of the engineer, preferably, by means of a steam, or compressed air, motor under his control, but not herein shown. Both the tread *m* and the flange *n* of this wheel R, are made considerably wider, or thicker, than the corresponding parts of an engine, or car, wheel for these reasons, namely: that, in the first place, it is necessary to have the flange *n* of the wheel R, held up against the side of the head of rail B, as it travels along between said rail and the guard-rail O, and as, for reasons well known, all guard-rails must be set far enough from the main rail to allow a certain amount of play of the engine and car wheels, between these two rails, (the amount of play being usually, I believe, an inch, or more,) it follows that to have the flange *n* confined rather closely between these rails (so as to keep said flange well up against the rail B), said flange must be made thicker than the flange of a car wheel. In the second place the tread *m* has to be wider than that of a car wheel; because while the car and engine wheels must certainly pass along without any interference of the shifting rail L, when the latter may be set in that position in which it is nearest to the outer side of the head of rail B, the outer vertical portion, or side, of wheel R, must come into contact with the inner vertical face, or side of the shifting-rail, or bar, L whenever said bar is in the position seen in the drawings, so as to vibrate said bar on its pivotal point, or fulcrum *g*.

The operation of the mechanism shown and so far described is as follows: With the switch set, as shown, for a train running on the main track in the direction indicated by arrow 1, so as to pass on to the siding, to avoid this, or to force the train to keep on the main track, the engineer will lower and bring into action the actuating wheel R, by forcing said wheel down on to rail B, as shown, before reaching the locality of the shifting-rail L; then, as said wheel travels along with its flange *n*, confined between the inner side of rail B, and the guard-rail O, the vertical, outer, surface of the wheel will come into contact with the upper portion of the inner vertical side of bar L, and pressing it outwardly, or away from the rail B (into about the position indicated by the dotted lines in Fig. 1), will cause said bar L, to actuate the slide I, in the direction indicated by arrow 2, and, thereby, through the media of the connections between said slide and slide E, effectuate a movement of the latter in the direction indicated by arrow 3; to the proper extent to shift the switch-points C, D, and close the switch to the siding, thus permitting the train to continue on the main track. Should the engineer observe, from the usual switch signal, (not shown) that the switch is already closed to the siding, he need not bring the wheel R, into action; but should he do so no effect will be produced thereby and the train will, of course, keep to the main track. Therefore, whenever it is desired to keep on the main track it will be desirable, as a precaution to avoid accident, on account of misunderstanding, or not seeing, the switch signal aright, to throw the wheel R down always, when approaching the switch. If, however, in approaching the switch it be desired to take the siding then wheel R must not be thrown down; but in such case, if the signal indicate that the switch to the siding is closed, then he must throw down the wheel S onto the rail A; in order to actuate the bar M (which would then be in the position shown in dotted lines in the drawings), and set the switch as seen at Fig. 1.

Of course, if deemed expedient a similar set of shifting rails, and their co-operating devices, may be arranged on the road, to set the switch-rails when the engine may be running from a siding toward, and on to a main track; and, so far as the sizes, proportions and details, of the parts comprising the means of connection between the shifting-rails L, M, and the switch-points C, D, are concerned variations may be made according to surrounding circumstances and in the judgment of the skilled engineer. And if found expedient, flanged shoes may be substituted for the revoluble devices, or wheels, R and S.

The sliding bars I, and E, might be directly connected, by a single lever, having its ends flexibly connected, respectively, to said slides and turning on a vertical point, at its middle; arranged either between the rails, or at one side of the track (as common in some other forms of switch mechanism); but as it is considered desirable, for the sake of safety, to have the slide I, located some distance (say a hundred feet or so) from the slide E, the style of slide connecting device shown is deemed about the best; and as there is always a possibility of accidental interference with any switch-operating mechanism that is placed between the rails, by the depending and dragging portion of some broken part of the car appliances, as, for instance, a broken brake-beam, it is

always best to locate the connecting devices outside of the track as shown.

Having now so fully explained my improved automatic switch mechanism that those ordinarily skilled in the art can make and use the same in either the form shown, or under some modification thereof, what I claim as new, and desire to secure by Letters Patent, is—

In an automatic rail road switch mechanism, the combination, with the main rails; the switch-rails; a shifting-rail, or bar, having a working face higher than the tops of the main rails; and suitable connections between said shifting-rail and the switch-rails, of a guard-rail; and an actuating wheel, or its equivalent, adapted to be lowered on to and raised above the main rail and having a flange which moves along easily between the said main and guard rails, and a tread portion sufficiently wide to bring the side of the wheel into action against the working face of the shifting-rail; all substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand this 22d day of September, 1893.

DWIGHT M. CHURCH.

In presence of—
M. E. FOXTEN,
WM. H. MYER.