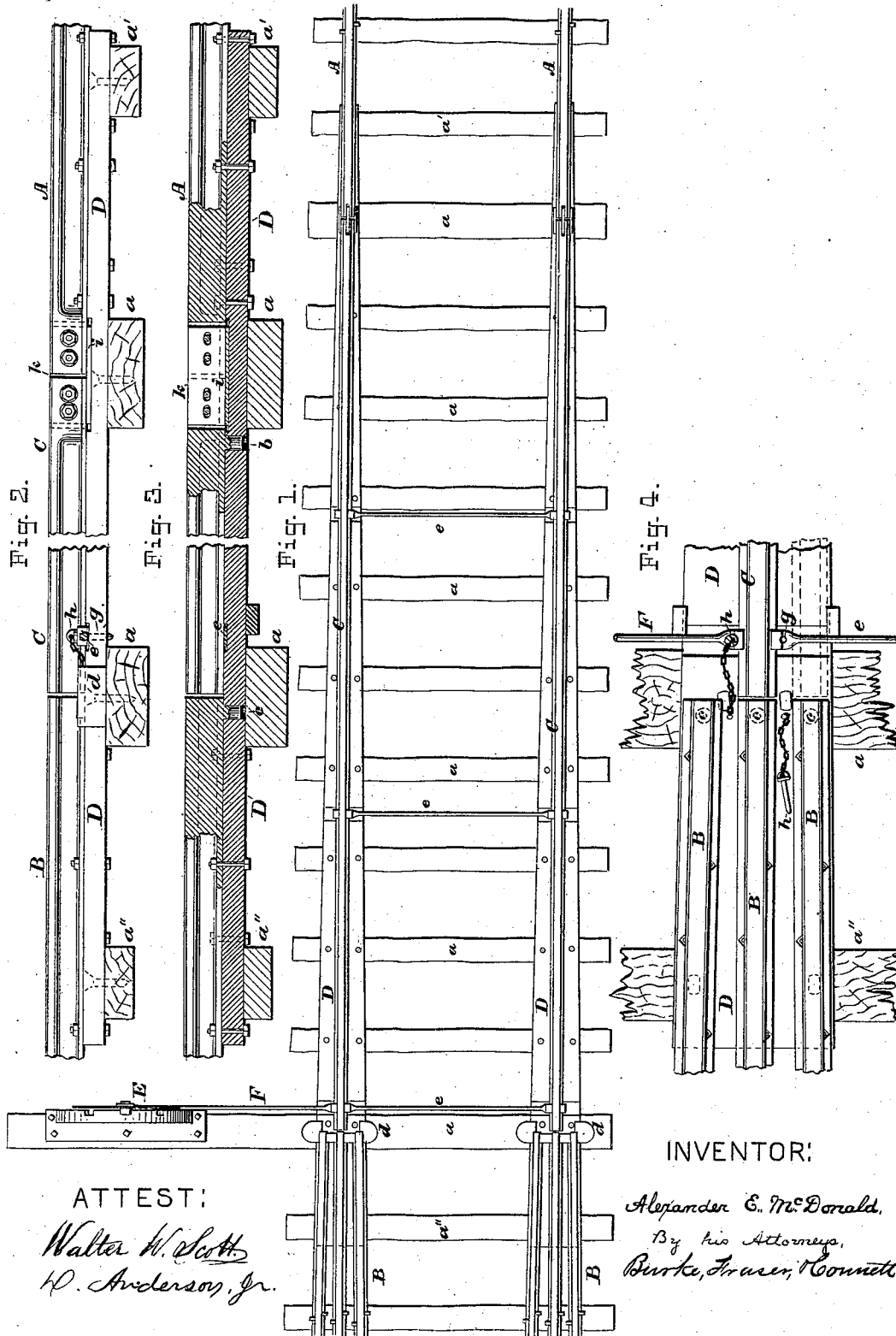


A. E. McDONALD.  
 Railway-Switch

No. 208,026.

Patented Sept. 17, 1878.



ATTEST:  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN RAILWAY-SWITCHES.

Specification forming part of Letters Patent No. **208,026**, dated September 17, 1878; application filed June 8, 1878.

*To all whom it may concern:*

Be it known that I, ALEXANDER E. McDONALD, of Hartford, in the county of Hartford and State of Connecticut, have invented certain Improvements in Railway-Switches and their appurtenances, of which the following is a specification:

To those acquainted with the workings of railways it is a familiar fact that the shrinkage and expansion of the rails, caused by variations of temperature, seriously affect the operation of switches. The switch-rails, not being connected with the ties, are moved endwise bodily by the fixed rails whenever expansion and contraction occur, thus making the play between the ends of the rails at the switch-joint greater than at any other joint. In consequence of this, and in view of the fact that the slipping of the so-called fixed rails on the ties and at the joints is extremely variable, it is difficult to settle upon just the proper movement to allow for at the switch-joint. The result is that the rails are apt to "jam" at the switch-joint, so that they cannot be readily moved unless considerable space is allowed, in which case, when the rails are contracted, they are apt to be drawn off the head-block, or at least to be crushed or splintered by the hammering of the wheels. Moreover, if the rails are loosely jointed, the traction of the engine-wheels tends to drive them endwise and jam, or cause a gap at the switch-joint, as the case may be. To remedy these defects, and to provide a switch that will operate freely at all temperatures with the minimum play at the joints is the object of my present invention, which I will now describe, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of a switch embodying my improvements. Fig. 2 is a side elevation of the same on a larger scale. Fig. 3 is a vertical sectional view. Fig. 4 is a plan of Fig. 3.

Let A A represent fixed rails of the main track, and B B the fixed rails of the track with which they connect through the medium of the switch. These rails may be spiked or otherwise fastened to ties *a a' a''*, in the usual manner.

C C are the radius or switch rails, which it has been customary heretofore to rest directly upon the ties. In my invention these rails rest upon plates D D throughout their entire length, the said plates being wide enough to allow the rails the necessary lateral movement. These plates may be connected by branches, or be in one piece, if desired. They are long enough to reach from the rails A to the rails B, both of which are securely bolted or attached to them; and I prefer to extend them from the tie *a'* to the tie *a''*, these being the next ties beyond the joints at each end of the switch-rails.

The plates D D being spiked or bolted firmly down to the ties or stringers, and the fixed rails A B lapped over upon and bolted, or otherwise firmly fixed to them, a firm bed is formed for the rails C C.

These may be jointed to the rails A A, or be provided with lugs *b b*, (see Fig. 3,) to drop into holes in the plates D D; or they may have the lugs in addition to the joint or attachment to the fixed rails. In case the rail C is jointed to the rail A, the latter, if it extends over upon the plate D, may be provided with a lug in lieu of the switch-rail. The lugs are designed to prevent the rails from moving endwise on the plates, and, as a substitute for other fastenings, might have their lower extremities threaded and provided with female screws or nuts. The fixed rails B B may also be provided with lugs *c c*, for the same purpose, in addition to the bolts used for attaching them to the plates. These rails may rest in head-blocks *d d*, as shown in Figs. 1 and 2, or these may be entirely omitted, as in Figs. 3 and 4. I do not think head-blocks are needed in my switch.

The radius-rails may be joined together by the usual tie-bars *e e*, and be provided with any kind of operative mechanism, E. To keep the switch-rail in place and in fixed coincidence with a given rail, B, I provide holes *g g* in the plates D D, at the proper points, and a pin, *h*, or pins, as the case may be, which passes through a hole in the switch-bar F, (or the tie-bar,) the latter hole being brought into coincidence with the holes in the plate

when the rails coincide. When the rails B B differ in number the holes *g g* must be arranged to correspond. The pins *h* may be attached to short chains, so as not to be readily lost or misplaced.

The plate or plates D D tie together the rails B B and the rails A A, between which are the switch-rails, so that the effects of expansion and contraction are neutralized, or nearly so, and the distance between the free ends of the switch-rails and the adjacent ends of the fixed rails remains substantially unchanged throughout the year.

As it is mainly important that the pivoted ends of the switch-rails should be connected with the fixed rails B B through both being connected with the plates D D, it is obvious that the rails A A may be rigidly secured to said plates, and the switch-rails be connected only with them, and not directly to the plates.

The plates D D may be of wrought-iron, perforated with spike-holes, and recessed to receive the chairs and lugs on the rails.

I am well aware that frogs with "tongues" and "split switches," so called, have been long used, wherein the movable tongues have rested upon plates and been attached thereto; but in such cases, there being no coincidence between the end of the switch-tongue and that of the fixed rail, the plate could exert no material corrective influence with respect to expansion and contraction, and its function as a bed-piece would not require that it be of metal, as is demanded in my switch.

I claim—

1. In a switch for railways in which the free end of the switch-rail is arranged to be brought into coincidence with the ends of two or more fixed rails adjacent thereto, the arrangement

beneath the entire length of the switch-rails of a metallic plate or plates, upon which the switch-rails and the fixed rails adjacent to the joint rest directly and to which they are attached, said plate or plates being wide enough to form a bed for the switch-rails to play upon, substantially as set forth.

2. The combination of the plate or plates D D, the switch-rails C C, resting upon said plates and connected therewith at their pivoted ends, their free ends being arranged to coincide with two or more fixed rails adjacent thereto, the rails A A, jointed to said switch-rails, and the rails B B secured to the plates D D, substantially as set forth.

3. The combination of the plate or plates D D, arranged to extend under the fixed rails at each end, the fixed rails A B, secured rigidly to the said plates, and the switch-rails C C, arranged to rest upon the plates D D, with their free ends adjacent to the ends of the rails B B, substantially as set forth.

4. The plate or plates D D, provided with holes *g g*, in combination with the perforated bar or tie, the pin or pins *h h*, and the rails B C, substantially as and for the purpose set forth.

5. The combination of the rails B C, provided with lugs *b c*, with the plates D D, provided with apertures or sockets to receive said lugs, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALEXANDER E. McDONALD.

Witnesses:

OLE H. HOLBERG,  
HENRY CONNETT.