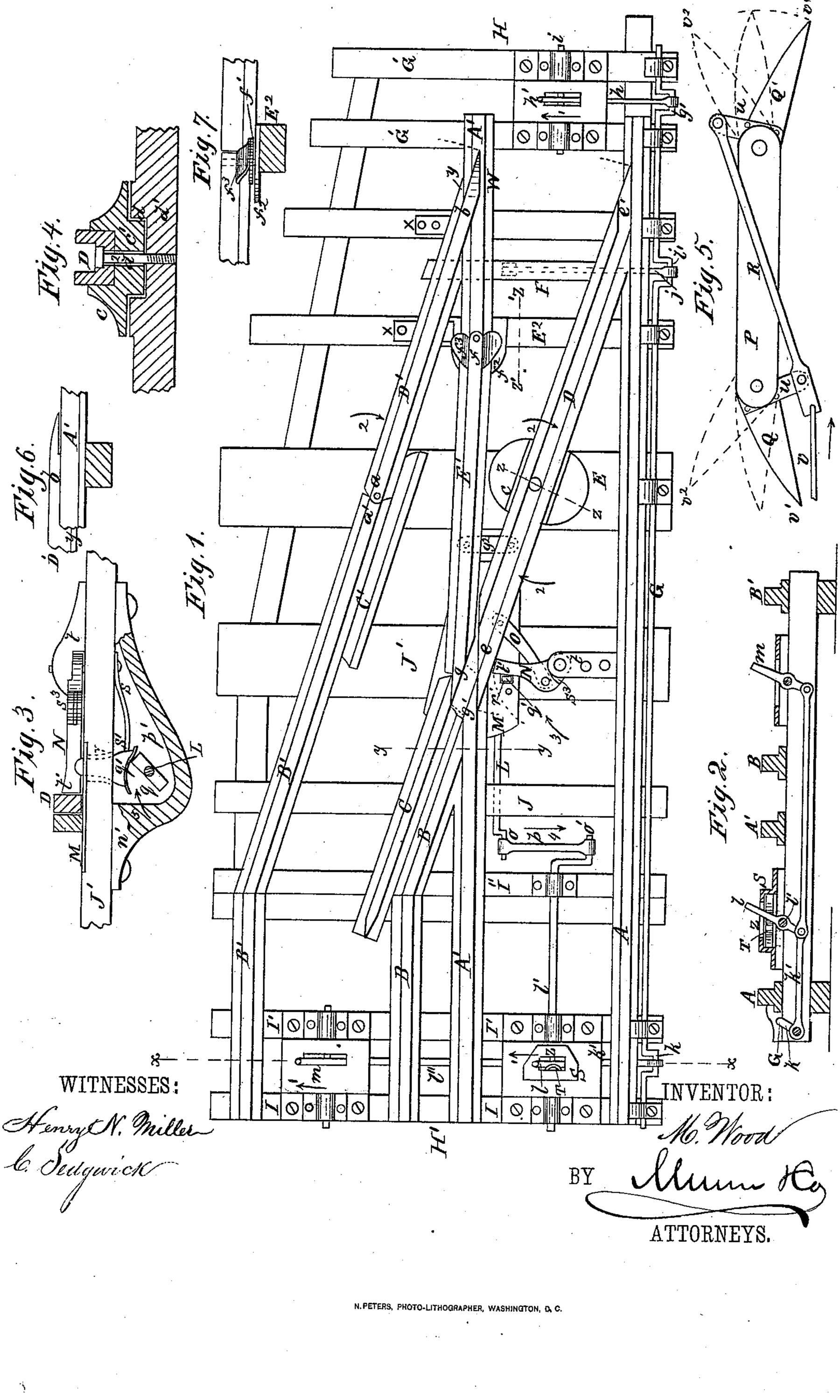
M. WOOD.

Railway Switch.

No. 230,095. Patented July 13, 1880.



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MARSHALL WOOD, OF ALDERSON, ASSIGNOR TO HIMSELF AND JOHN A. MONTGOMERY, OF LEWISBURG, WEST VIRGINIA.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 230,095, dated July 13, 1880.

Application filed November 29, 1879.

To all whom it may concern:

Be it known that I, MARSHALL WOOD, of Alderson, in the county of Monroe and State of West Virginia, have invented a new and Improved Railway-Switch, of which the following is a specification.

The object of my invention is to provide a railway-switch which is adapted to be opened and closed by the passing engine.

A second object of my invention is to dispense with the frog usually placed at the crossing of the rails of the switch and main track.

In the accompanying drawings, Figure 1 is a plan of my improved switch. Fig. 2 is a cross-section of the same, taken on line *x x* of Fig. 1. Figs. 3 and 4 are sectional details, taken respectively on lines *y y* and *z z* of Fig. 1. Fig. 5 represents the device for opening and closing the switch. Fig. 6 is a detail, in side elevation, of the movable end of switch-rail D′; and Fig. 7 is a side view of the chair for connecting the movable main-track rail with the main track.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A′ are the rails of the main track. B B′ are the rails of the side track. C C′ are the guard-rails, and D D′ are the movable switch-rails.

Switch-rail D′ has its end *a* pivoted at the end *a′* of rail B′, and its end *b* is adapted to be moved to and from main-track rail A′. Switch-rail D, between main-track rails A A′, is placed, about midway of its length, in a chair, *c*, which has on its under side a circular tenon, *c′*, which is placed in a circular mortise, *d*, in plate *d′*, which is fastened to tie E. A bolt, *d″*, is passed down through rail D, chair *c*, plate *d′*, and tie E. Said bolt *d″* serves as a pivot, on which the rail D can be turned laterally, so as to throw its ends *e e′* in or out of connection with the main rails A′ A, respectively. The tenon *c′*, combined with the pivot-bolt *d″*, fastens the rail D to tie E securely, and prevents the said rail from shifting in either direction; but at the same time said rail is allowed to turn freely.

E′ is the movable rail of the main track. It has its end *f*, next to the end of main-track rail A′, resting on and pivoted to a crescent-shaped chair, *f′*. Said crescent-shaped chair *f′* is fixed to a plate, f^2, placed on tie E^2 under the ends of rails A′ E′. A curved plate, f^3, is passed through the web of rail E′ at the pivoted end *f*, and the ends of said plate f^3 are bent down over the flanges of rail E′ and bear on the crescent-shaped chair *f′*. The purpose of plate f^3 is to support and steady rail E′ laterally at its pivoted end *f*, and to strengthen by its lateral support the pivotal connection of the end of said rail with chair *f′*. The turned-down edges of the plate f^3 are securely fastened to the edges of the chair *f′* in order to produce the bracing effect.

The diagonal end *g* of movable rail E′ is adapted to be moved laterally to join the diagonal end of rail A′, to open the main track for the passing of trains, and also to join the guard-rail C, as in Fig. 1, when the siding is to be opened for the passage of trains from the main track. These movements of rail E′ are produced by movable switch-rail D by the following arrangement: Rail E′ is connected with the adjacent flange of movable switch-rail D by a pivoted link, g^2, so that when end *e* of rail D is moved up to rail A′ to close the main track it pushes rail E′ sidewise away from rail A′, as shown in Fig. 1; but when rail D is moved away from rails A A′ to open the main-track rail E′ is drawn in line with rail A′, and its end *g* rests against the end of rail A′.

The ends *b e′* of movable switch-rails D D′ are connected underneath main-track rails A A′ by a bar, F, pivoted to the flanges of said rails D D′, so that the two movable rails D D′ can be moved simultaneously. The mechanism for operating the movable switch-rails D D′ consists of a shaft, G, boxed in the ties outside of main-track rail A and parallel to the main track. At the entrance end H of the switch shaft G is provided with a crank, *g′*. To said crank is pivoted one end of a connecting-rod, *h*. The opposite end of said connecting-rod is pivoted to a lever, *h′*, fulcrumed to a shaft, *i*, pivoted on ties G′ G′, midway between rails A A′. Opposite the ends *b e′* of switch-rail D D′ is a crank, *i′*, in shaft G, to which a connecting-rod, *j*, is pivoted. The opposite end of said rod *j* is pivoted to bar F.

k is a crank on shaft G, near the end opposite crank *g'*. To crank *k* is pivoted one end of a connecting-rod, *k'*. The opposite end of said connecting-rod is pivoted to the lower end of lever *l*. Said lever is placed midway between rails A A', and is fulcrumed to a shaft, *l'*, which is boxed on ties I I' I''. A connecting-rod, *l''*, extends from the lower end of lever *l* to the lower end of lever *m*, fulcrumed between switch-rails B B' on ties I I'.

L is a shaft journaled under ties J J' in hanging boxes. A crank, *o*, on shaft L is connected by a rod, *p*, with a crank, *o'*, on shaft *l'*. In recess *p'* of hanging box *n'* (under tie J', in which shaft L is boxed) a lever, *q*, is fixed to shaft L. Above the lever *q* is a latch, *q'*, which is passed up through a hole, *r*, in tie J', and through a hole, *r'*, in plate M, which is placed under the ends of rails A' B C D E'. A flat spring, *s*, fixed at one end to the under side of tie J' in recess *p'*, has its free end *s'* bearing on latch *q'*, and serves to keep said latch pressed down against lever *q*.

N is a pawl having one end, *s'''*, pivoted to the bar *t*, fixed to tie J', and the opposite end, *t'*, resting on plate M. The pawl N is connected with the end *e* of rail D by a link, O.

By means of either of the levers *h'*, *l*, and *m*, the shafts G and *l'* are oscillated through the connection of its cranks *g'* and *k* with said levers, as hereinbefore described. Shaft *l'* is oscillated directly by lever *l*, as said lever is fixed to said shaft. Shaft *l'* can also be oscillated by levers *m* and *h'*, lever *m'* being connected with lever *l* by connecting-rod *l''*, and lever *h'* is connected with *l''* through connecting-rod *h*, shaft G, and connecting-rod *k'*, joining crank *k* with lever *l*.

Thus, when either one of the levers *h'*, *l*, or *m* is moved in the direction of arrow 1 the movable switch-rails D D' are turned in the direction of arrows 2, throwing end *b* of rail D' against and upon main-track rail A', end *e'* of rail D against main-track rail A, and end *e* of rail D against main-track rail A', in the manner shown in Fig. 1. At the same time the end *g* of movable rail E' is moved over against guard-rail C. As the end *e* of rail D moves up to rail A' through link O said rail draws the pawl N in the direction of arrow 3 until its end *t'* bears against the side of rail D. By the same movement the shaft *l'* is oscillated and its crank *o'* turned in the direction of arrow 4 through connecting-rod *p* and crank *o*. This motion is communicated to shaft L, and shaft L turns lever *q* in the direction of arrow 5, and this motion of lever *q* throws the latch up through opening *r'* in plate M alongside of pawl N. The pawl, bearing against the side of rail D, prevents its end *e* from slipping back from its junction with rail A', and latch *q'* prevents the pawl N from slipping from its position against rail D. Now, by turning either of the levers *h' l m* in an opposite direction from that indicated by arrows 1, the latch *q'* is lowered so as to allow the pawl N to move back, the movable switch-rails D D' are turned away from their connection with main-track rails A A', and the end *g* of movable rail E' is moved back until it rests against end *g'* of rail A', furnishing thus a continuous bearing for the wheels on rail A'.

By these movements the switch is first opened for the passage of the trains from the main tracks A A' to the side tracks, B B', and by the second movement the movable switch-rails D D' are disconnected from the main-track rails A A', whereby the siding is closed and the main track opened.

These movements of opening and closing the switch and locking the movable rail D by means of pawl N are performed automatically by the device shown in Fig. 5. This device consists of a bar, P, which is placed under the forward truck of the engine, or under the truck of a car, lengthwise of the engine or car, and sufficiently low down to act against the levers *h' l m*, which project above the level of the tops of the track-rails.

To the ends of the bar P are pivoted conical arms Q Q'. Both of said arms have a lateral movement on their pivots, as indicated by the dotted lines. On opposite sides of arms Q Q' are levers *u u*.

R is a connecting-rod, having its ends pivoted to levers *u u*. A rod, *v*, extends from connecting-rod R to a lever or other suitable device in the cab of the engine, so that by pushing the rod *v* in the direction of the arrow the arms Q Q' are drawn into the position they occupy in Fig. 5; but when the rod *v* is drawn in the opposite direction to that indicated by the arrow, arms Q Q' are moved into the position indicated by the dotted lines. When arms Q Q' are in the first position, *v'*, they will throw the levers *h' l m* in the direction indicated by arrows 1; when in the second position, v^2, they will throw said lever in a direction opposite to arrows 1; but when the arms Q Q' are between these two positions—that is, in lines parallel to bar P—the said arms will pass said levers without acting on them at all.

From this it can be readily seen that when the engine is coming along the main track toward the siding, if it is desired to pass into said siding and the switch is closed, the arms Q Q' are placed in the position *v'*, which they occupy in Fig. 5. Thus placed the forward arm, Q, will strike lever *h'* and throw it in the direction of arrow 1, and, as before mentioned, the several movements will take place whereby the switch-rails D D' will be moved into the position they occupy in Fig. 1.

If the train is to pass along the main track and the switch is set for the siding, as in Fig. 1, the arms Q Q' are turned to the position indicated by the dotted lines v^2, when the point of forward arm, Q, will bear against lever *h'* and throw it over in the opposite direction, and thereby move the switch-rails away from their connection with main-track rails A A', and thus open the main track.

If the engine runs out of the switch from end H', or runs in the main track, the arms Q Q'

will act on the levers *m* and *l* in the same manner as on lever *h'*.

By having two arms, Q Q', the engine can run either backward or forward and operate the switch-levers both ways.

As before mentioned, the arrangement first described for operating the switch can be applied to a car-truck as well as to the engine.

Instead of cutting a slot in main-track rail A' at *w* for the passage of the wheels onto the switch-rail D', I place the rail D' on plates *x x*, fixed to the ties, so as to raise said rail above rail A'. Then the flange *y* of rail D' is cut away so as to permit the end *b* to project over the top of rail A' when said rail D' is moved up to rail A', as in Fig. 1. The top of end *b* is chamfered down, so that it will give a gradual rise from the rail A', whereby, when the train enters the switch, the wheels on rail A' will pass up on rail D' and the flanges of the wheels will pass over rail A', instead of through a slot. The purpose of this is to avoid weakening rail A' by cutting a slot in it, and also to give a continuous tread for the wheels on rail A'.

In the box S, inclosing lever *l*, is placed the switch-lock, which consists of a V-shaped spring, T, which projects part way across the slot *z*, so that when the lever is moved sidewise it forces the spring back until it passes by said spring, which then springs out and retains the lever in the position to which it was moved, as shown in Fig. 1.

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

1. The combination, with the main, side-track, and guard rails, of the two switch-rails D D', the one being pivoted near the middle and the other at one end, adjacent to that of the side-track rail B', to operate as shown and described.

2. The curved plate f^3, in combination with the rail E', chain *f'*, and pivot d^2, as and for the purpose specified.

3. The movable switch-rails D D', constructed as described, in combination with shaft G, connecting-rods *h j k' l''*, and levers *h'*, *l*, and *m*, arranged and operating in the manner substantially as described.

4. The switch-rail D and the movable part E' of the main rail, connected by pivoted link g^2, as and for the purpose set forth.

5. The combination, with the shaft *l'*, forming a part of the switch mechanism, of the shaft L, connected therewith by rod *p* and cranks *o o'*, the hanging box *n'*, the lever *q*, the spring-latch *q'*, the tie J', having hole *r*, the plate *m*, having hole *r'*, and the bar *t*, provided with pivoted pawl N, connected with the end of rail D, as and for the purpose specified.

MARSHALL WOOD.

Witnesses:
BAYLUS CADE,
G. A. SMITH.