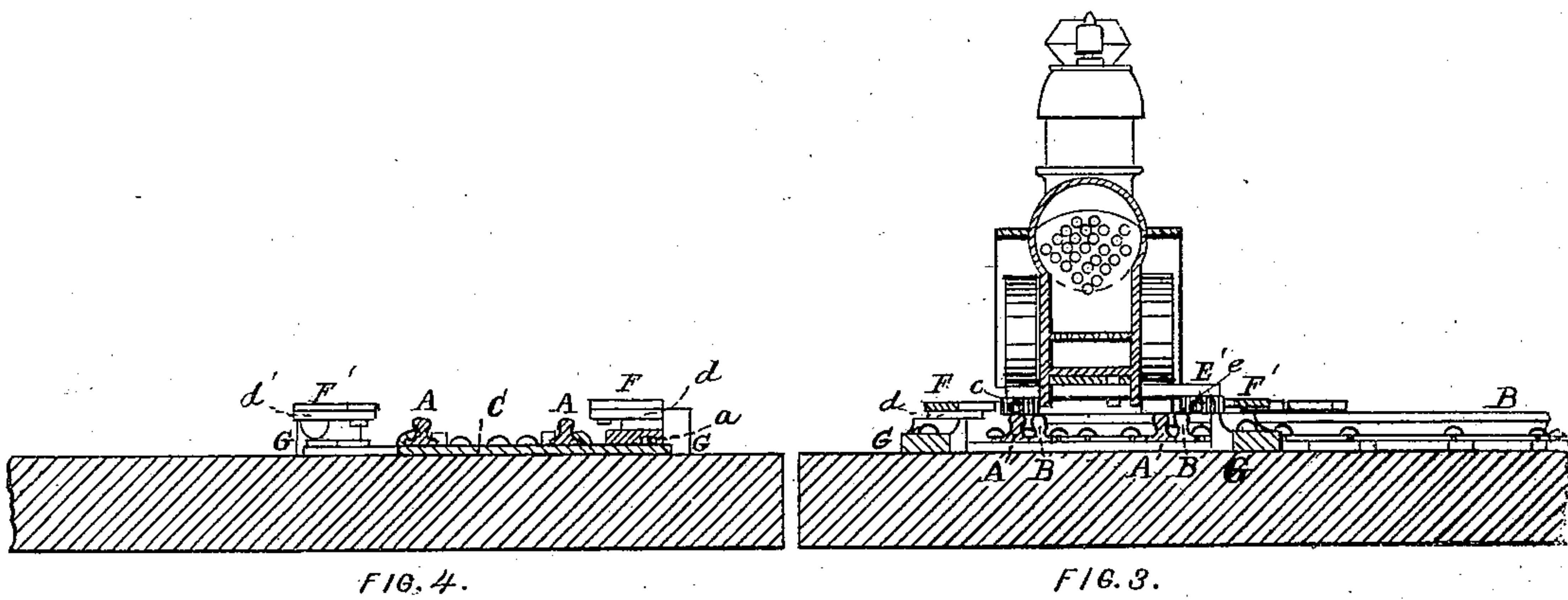
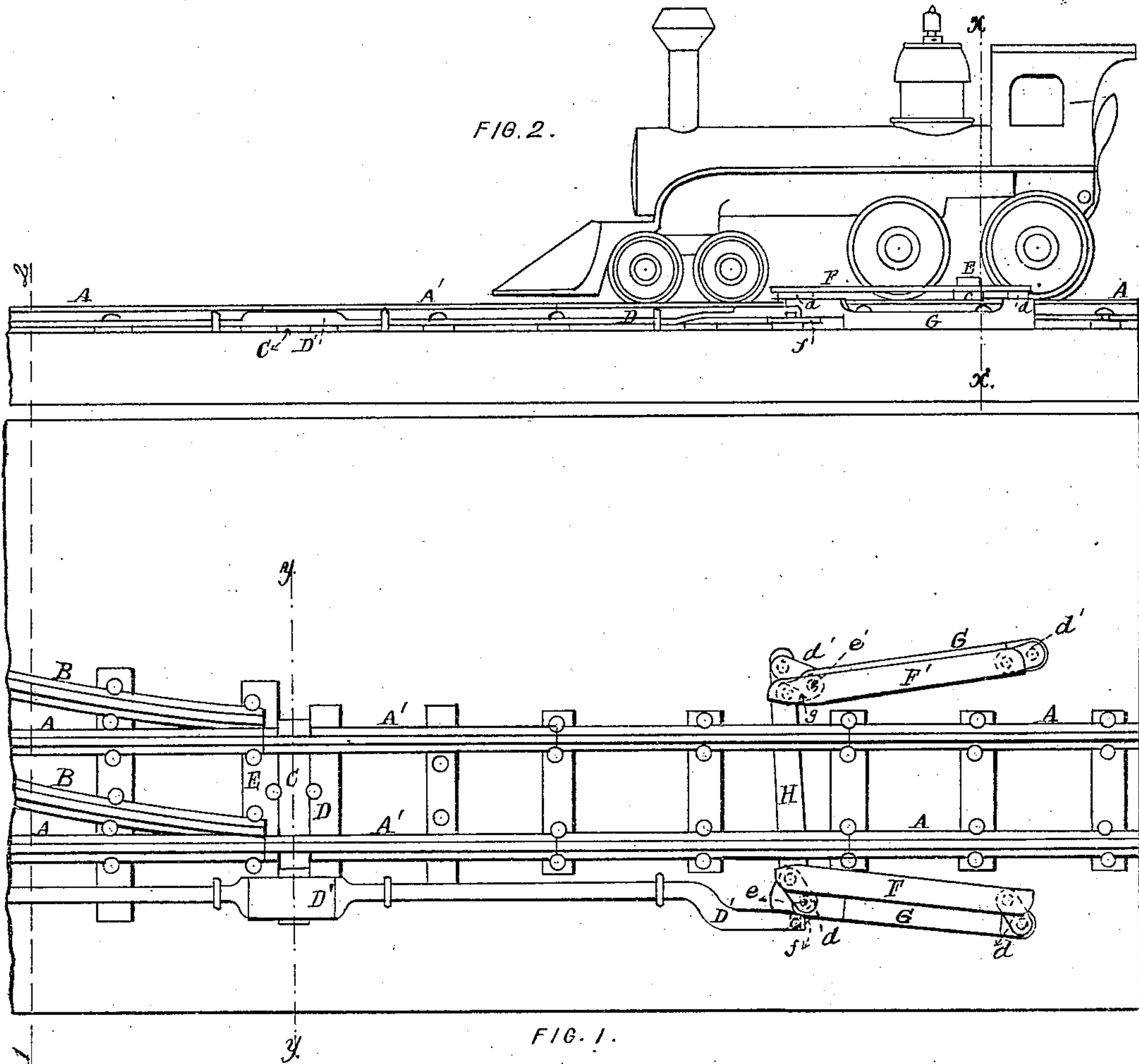


**A. B. EDMANDS.**  
**Railway Switches.**

No. 153,161.

Patented July 21, 1874.



WITNESSES.

*Wm. Lombard*  
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INVENTOR.

*Artemas B. Edmands*

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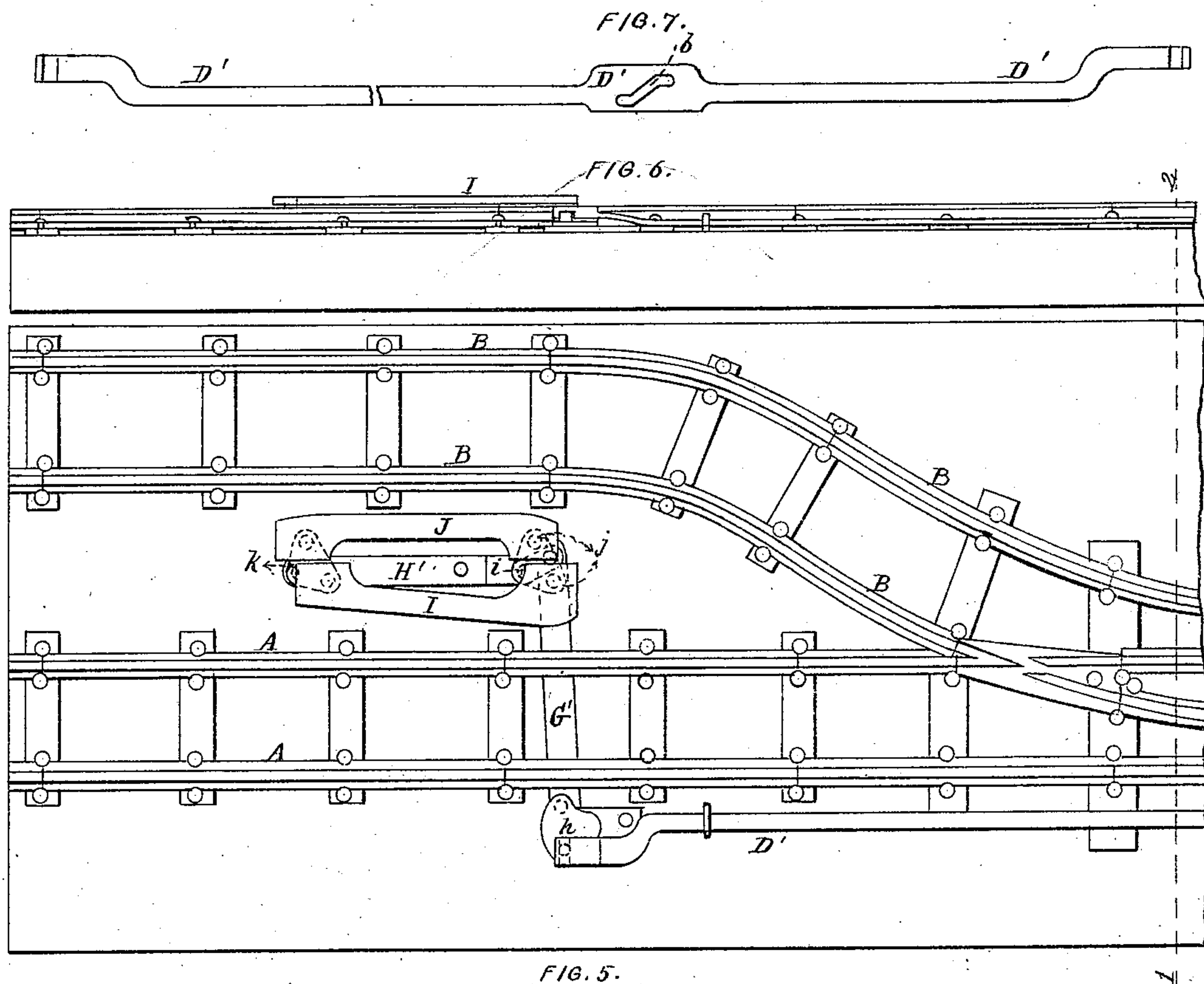


FIG. 5.

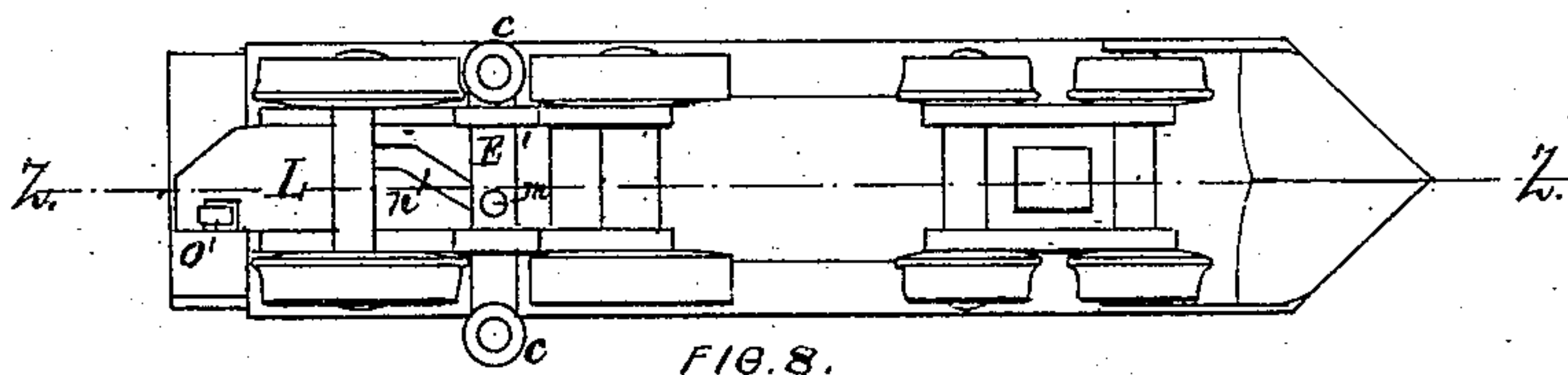


FIG. 8.

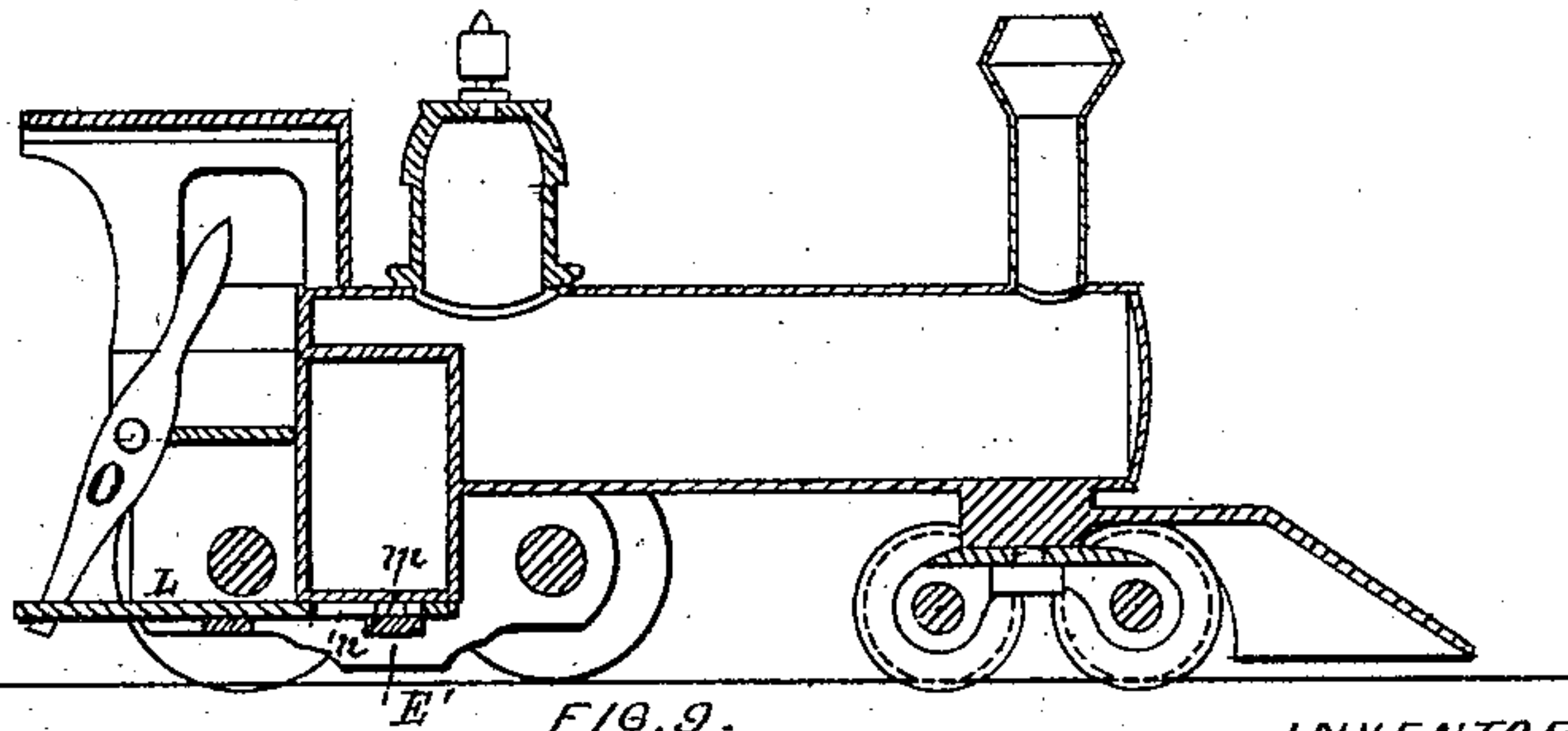


FIG. 9.

WITNESSES.

*N. B. Lombard*  
*Wm. P. Edwards*

INVENTOR.

*Artemas B. Edmands*



# UNITED STATES PATENT OFFICE.

ARTEMAS B. EDMANDS, OF SAUGUS, MASSACHUSETTS.

## IMPROVEMENT IN RAILWAY-SWITCHES.

Specification forming part of Letters Patent No. **153,161**, dated July 21, 1874; application filed September 30, 1873.

*To all whom it may concern:*

Be it known that I, ARTEMAS B. EDMANDS, of Saugus, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Railroad-Switches, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to the arrangement of the switch and the mechanism for operating and controlling the same through the medium of the moving train; and it consists, first, in combination with a railroad-switch, of a supplementary rail or bar placed outside of the track, and arranged obliquely thereto, mounted upon and pivoted to the movable ends of two or more radius-arms, which in their turn are pivoted to a fixed bar, or its equivalent, firmly secured to the sleepers or the road-bed, one of said radius-arms being secured to the upper end of a short vertical rocker-shaft, which has its bearings in said fixed bar, and serving as a pivot for said radius-arm, and having secured to its lower end an elbow-lever, the movable end of one arm of which is connected to a sliding cam-bar lying by the side of and parallel to the straight track, and arranged in suitable bearings in such a manner that it may have an endwise motion imparted to it in either direction, while the movable end of the other arm is connected by a link or rod to a similar lever, rocker-shaft, and radius-arms, to be operated by a corresponding supplementary rail or bar arranged in like manner upon the other side of the track. These supplementary rails are both placed just outside of the track-rail, upon either side of the track, and obliquely thereto, so that the ends thereof that are next to or toward the switch are nearer to the track-rails than the opposite ends, and said supplementary rails are, as a matter of convenience, a few inches above the level of the track-rails, and so arranged in relation to each other that when one of said supplementary or movable and oblique rails is in its nearest position to the track-rail, and its radius-arms are nearly at right angles to said track, the movable rail upon the opposite side of the track is at its greatest distance from said track, and its radius-arms are nearly parallel to said track, said mova-

ble rails or bars having a lateral and a slightly forward motion imparted to them by the moving train by means of a bar attached to the under side of the locomotive, or a car, or both, so arranged that it may be adjusted so as to project beyond the track upon either side of the engine or car, at the pleasure of the operator, in order to act upon either of the movable supplementary rails, as may be necessary to connect the switch with the track upon which the train is to be run. My invention further consists in a special arrangement of similar movable supplementary rails or bars, for controlling the switch when the engine or train is moving on either line of a double track toward a single track, as will be more fully described. My invention further consists in the use, in combination with the pivoted rails which constitute the switch, and the above-described supplementary rails, one or more, placed at the side of the track in an oblique position, and arranged to be moved bodily in a lateral direction to or from the track, of a sliding bar, pivoted to the under side of said switch-rails near their movable ends, and at right angles to the straight track, fitted to move endwise between guides and held firmly in place thereby, one end of said bar projecting a short distance outside of the track, and provided with a pin projecting upward therefrom, and fitting into a cam-shaped groove formed in a bar lying by the side of the track, and arranged in suitable bearings in such a manner that it may have an endwise motion imparted to it in either direction by the movement of said oblique supplementary rails, to which it is connected, and, by virtue of the peculiar shape of the cam-slot formed therein, cause the sliding bar and switch-rails to be moved in a direction at right angles to the track, and to hold them firmly locked at either extreme of said sidewise motion, or in connection with either track. My invention further consists in the use of a sliding cam, operated by means of a lever from the foot-board of an engine, or the platform of a car, so connected to the adjustable switch-controlling bar upon the engine or car that an endwise movement thereof in the direction of the length of the engine or car will cause said controlling-bar to be moved to one side or the



other of the engine or car in a direction at right angles to the motion of the cam-plate, and firmly secure said bar in position at either extreme of its motion.

Figure 1 of the drawing is a plan of a portion of the track, including the switch and the mechanism for operating and controlling the same when the engine or train is moving from the single track toward the double track. Fig. 2 is a side elevation of the same portion with the locomotive in position thereon. Fig. 3 is a transverse section on line *xx* on Fig. 2. Fig. 4 is a transverse section on line *yy* on Figs. 1 and 2. Fig. 5 is a plan of another portion of the track contiguous to the portion shown in Fig. 1, the line 1 2 on Fig. 5 corresponding to the line 1 2 on Fig. 1. Fig. 6 is a side elevation of the same. Fig. 7 is a plan of the under side of the cam-rod for moving the switch. Fig. 8 is a plan of the under side of the locomotive, showing the pressure-bar and trucks for operating the switch, and the means of adjusting the same; and Fig. 9 is a vertical longitudinal section of the same on line *zz* on Fig. 8.

A A are the rails of the main or direct track; B B, the rails of the side track; and A' A' are the switch-rails, pivoted at one end and so arranged that the opposite end thereof may be moved laterally to bring them into conjunction with either the rails A A of the main track or the rails B B of the side track, all in a well-known manner. The movable ends of the switch-rails A' A' are secured to the bar C, fitted to slide between the ties D and E, in a well-known manner. The bar C extends beyond the outside rail of the main or direct track, and has set in its upper side, near the end, the pin or stud *a*, which fits into the cam-shaped groove *b* in the under side of the bar or rod D', resting in suitable bearings alongside of and parallel to the outer rail of the main track, in such a manner that an endwise motion may be imparted thereto, and through the medium of the cam-groove *b* and the pin *a* an endwise motion may also be imparted to the bar C, carrying with it the movable ends of the switch-rails A' A'. The rod or bar D' is moved endwise in either direction, when the engine or car is approaching the double track, by means of one end of the bar E' on the engine or car, or one of the trucks *c c* mounted thereon, coming in contact with the side of the rail or bar F, or a corresponding rail or bar, F', on the opposite side of the track, according to the position of the switch. The rails or bars F and F' are placed just outside of the track-rails, one upon either side, and at such an angle thereto that the ends of said bars toward the switch shall each be some four to six inches, more or less, nearer to the track-rail than the opposite ends, said bars being pivoted at each end, and at other points, if desired, to the movable ends of radius-arms *d d' d'*. The radius-arms, *d* and *d'*, nearest to the switch are secured to the upper end of short rocker-shafts *e e'*, having bearings in the beams G, which are firmly secured to the sleepers or to

the road-bed in a fixed position. The shaft *e* has secured to its lower end the elbow-lever *f*, one arm of which is pivoted to the end of the cam-rod D', and the other arm of which is connected to the link H, the opposite end of which is connected to the short lever *g*, secured to the lower end of the rocker-shaft *e'*. The rails or bars F and F' are so arranged with relation to each other, and are so connected together and to the switch, that when the switch-rails A A are in line with the main or direct track, the rail or bar F will be in its nearest position to the track-rail, and the radius-arms *d*, to which it is pivoted, will be nearly at right angles to said track-rails, and the rail F' will be at its greatest distance from the track, and its radius-arms *d' d'* will be nearly parallel to the track-rail.

The rails F and F' are placed a few inches above the level of the track, in order that they may be readily acted upon by the bar E, secured to the under side of the engine or car, or by the anti-friction truck *c* mounted thereon, and, by virtue of the oblique position of the bar or rail F or F', cause said rail to be moved away from the track-rail, swinging its radius-arms upon their axes, and causing the cam rod or bar D to be moved endwise, and impart a lateral motion to the movable ends of the switch-rails.

It will be noticed that the oblique rails F and F', when they are moved, move bodily—that is, both ends thereof move an equal distance; and by this arrangement the movement of the switch may be made much more gradual than if the oblique rails were pivoted at one end and swung upon said pivot as the free end was moved, as has been the practice heretofore.

The oblique rails F and F' are so connected together that when F is moved away from the track, F' will be moved toward it, and vice versa. The cam rod or bar D' extends beyond the bar C in opposite directions. One end is connected to one arm of the elbow-lever *h*, arranged to vibrate about an axis set in a suitable bearing therefor, the other arm of said lever *h* being pivoted to one end of the connecting-rod G', the opposite end of which is connected to the movable end of a short radius arm or lever secured to the lower end of the rocker-shaft *i*, having its bearing in the fixed bar H', and having secured to its upper end the elbow-lever *j*. To the opposite end of the bar H is pivoted the elbow-lever *k*, precisely like *j*, and arranged with its arms parallel to the arms of *j*, as seen in Fig. 5. I is a rail or bar, pivoted to the movable ends of the arms of the elbow-levers *j* and *k*, that project toward the straight track, and so shaped that its edge toward the straight track is oblique thereto, as shown; and J is a similar bar, pivoted to the arms of the elbow-levers *j* and *k*, that project toward the side track, I being used for controlling the switch when the train is approaching the switch from that direction on the straight track, and J being used to con-



trol the switch when the train is approaching the switch from the side track.

One great objection to self-acting switches, as heretofore constructed, has been the suddenness with which they act, and the consequent shock to the parts, occasioning breakage, and often worse evils.

It will be evident to the careful observer that this invention effectually overcomes that objection by the peculiar arrangement and operation of the oblique bars F, F', I, and J. Said bars may be of any desired length, from ten to one hundred feet, or even more, and the switch is moving during the whole time that the engine is traveling the length of the oblique bar. I propose to make said bars about thirty feet long, which I think will be ample time to move the switch about six inches, the angle of the inner edge of said bars being about one to sixty; but the length of said oblique rails may be increased almost indefinitely, if desired, a greater number of radius-arms being used as the length is increased. The oblique rails or bars F, F', I, and J may be connected to and operate the switch through the medium of other and different mechanism from that shown without affecting the principle of action of said rails.

The bar E is mounted in any suitable and convenient position on the under side of the locomotive, or of a car, in suitable bearings, said bar being arranged crosswise of the engine or car, in such a manner that it may be moved endwise, so as to project from either side of the engine or car over and beyond the rail of the track, in such a position that its projecting end, or the trucks c mounted thereon, will strike the oblique rail, F, F', I, or J, at the end farthest from the track; and as the engine or car advances, said bar or truck, continuing to press against said rail, will cause it to be moved away from the track bodily, as heretofore described. L is a plate of metal arranged in suitable bearings just above the bar E, and in which it may be moved endwise in the direction of the length of the engine or car, and provided with a cam-slot, n, the middle portion of which is inclined, while the two end portions are parallel to the line of motion of said plate, said slot acting upon the

pin m set in the upper side of the bar E. O is a lever by which the plate L is operated from the foot-board of the engine or platform of a car.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. As a means of operating and controlling the position of a railway-switch by the moving engine or car, the oblique bars F, F', I, and J, one or more connected to the switch-rails A' A' by any suitable mechanism, to impart motion to said switch by a parallel movement of said oblique bars, substantially as described.

2. The combination of the bars F, F', I and J, one or more arranged and operating as set forth, and connected by any suitable mechanism to the switch-rails A' A', with an adjustable bar, E, mounted in a suitable position on the locomotive or railway-car, substantially as described.

3. In combination with the bars F, F', I, and J; either one or all arranged to operate the switch by a bodily movement thereof in a lateral direction to or from the track, the cam rod or bar D', provided with the cam slot or groove b, and the bar C, provided with the pin a fixed therein, all arranged and operating substantially as set forth, to impart a lateral motion to the switch-rails, and lock them in connection with either track, as described.

4. The combination of the switch-rails A' A', the bar C, the cam-rod D', and one or more oblique rails, F, F', I, or J, arranged, connected, and operating as set forth, with an adjustable pressure-bar, E', mounted in a suitable position upon the locomotive or a railway-car, substantially as described.

5. The combination of the bar E', with or without the trucks c c mounted thereon, and provided with a pin, m, with the plate L, provided with the cam-shaped slot n, arranged and operating as described, for the purpose specified.

Executed at Boston this 25th day of September, 1873.

ARTEMAS B. EDMANDS.

Witnesses:

N. C. LOMBARD,  
WM. P. EDWARDS.