

O. PAGAN.
 Safety Automatic Railroad Switch.
 No. 229,745.
 Patented July 6, 1880.

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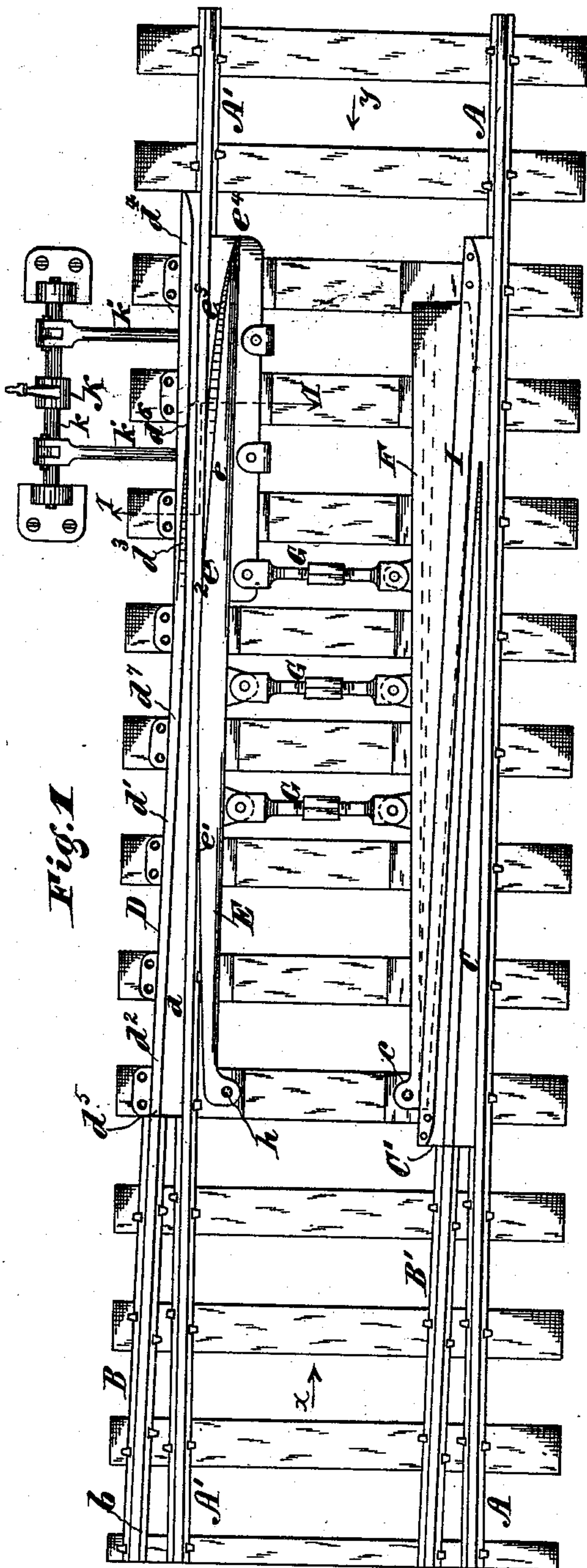


Fig. 1

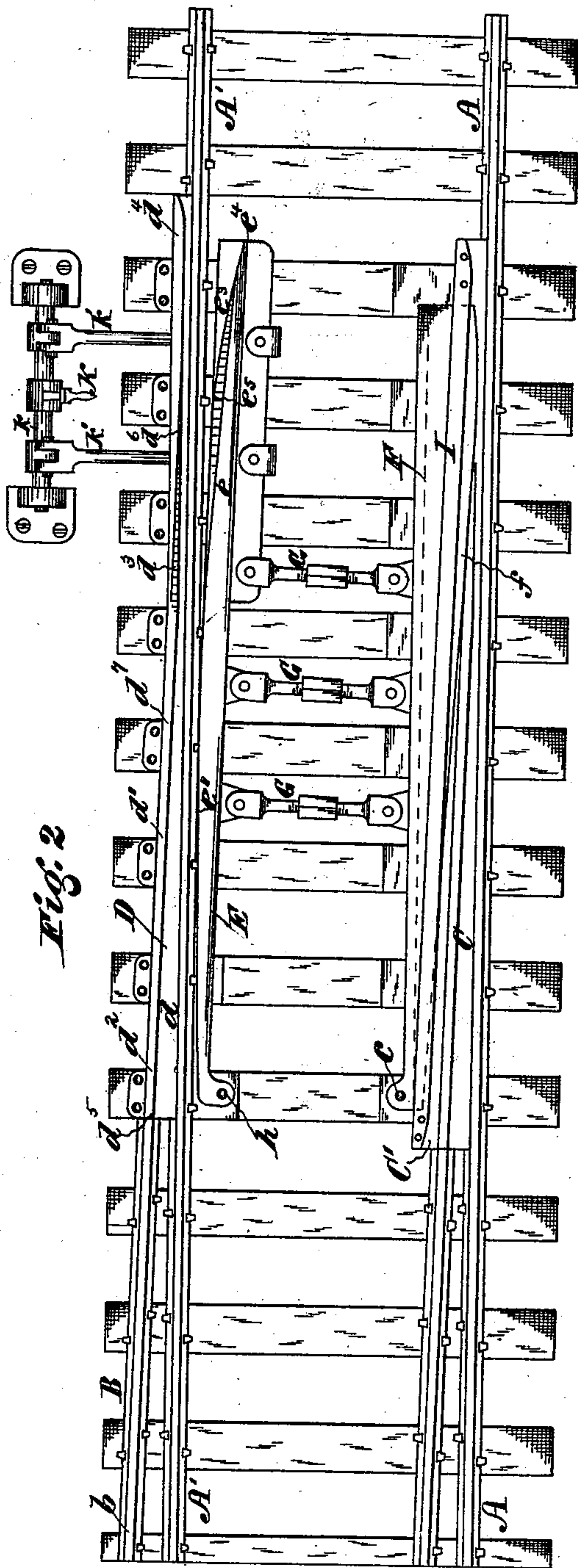


Fig. 2

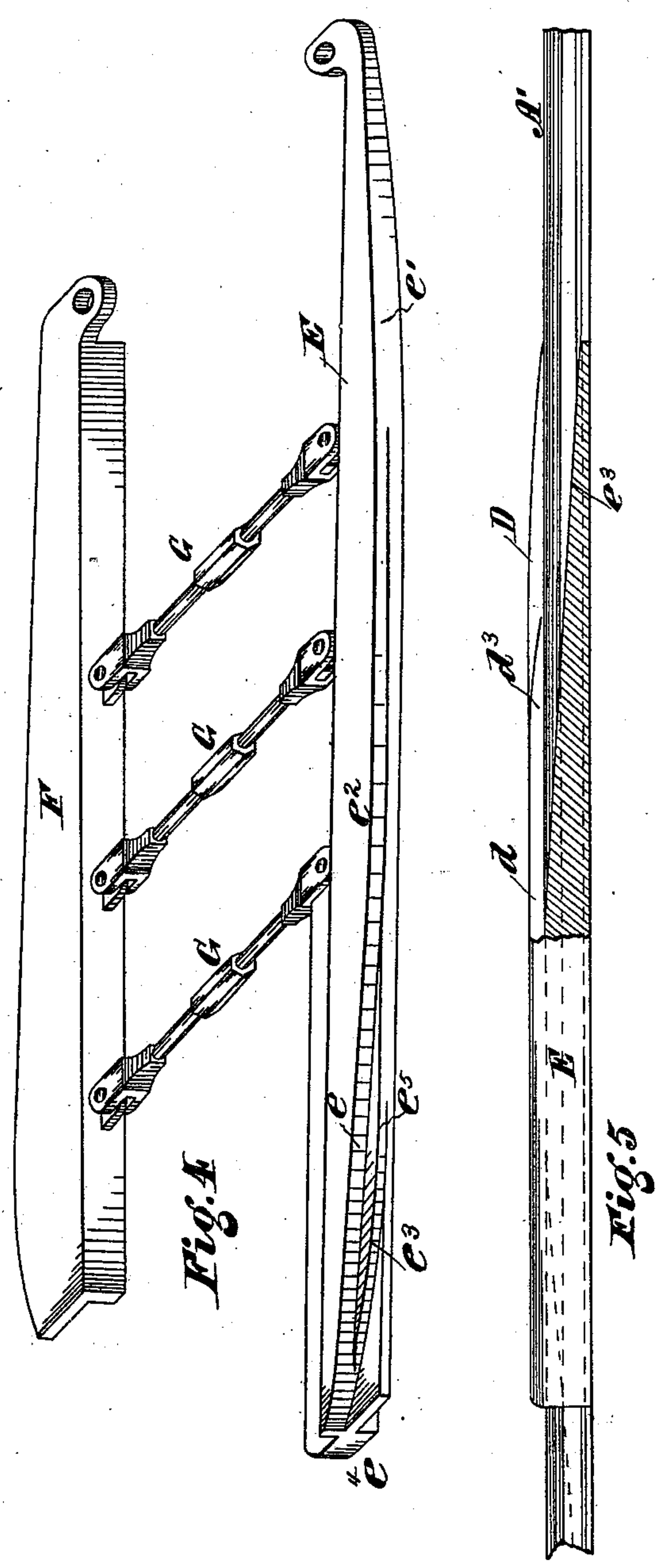
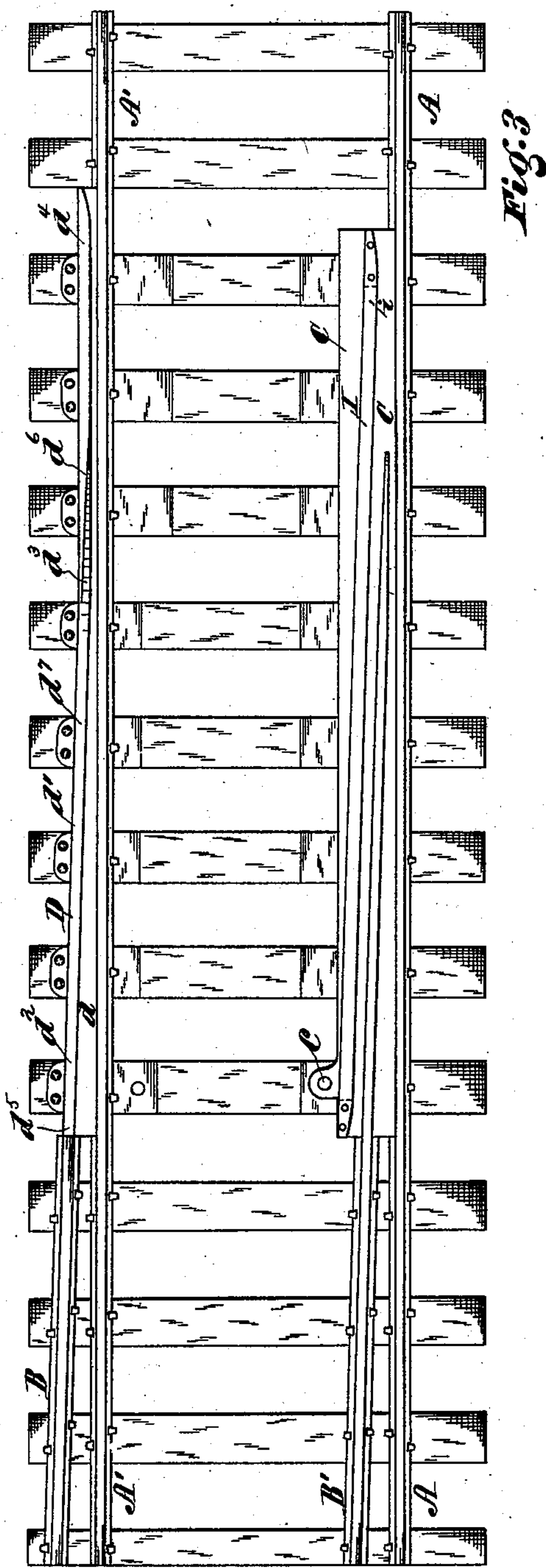
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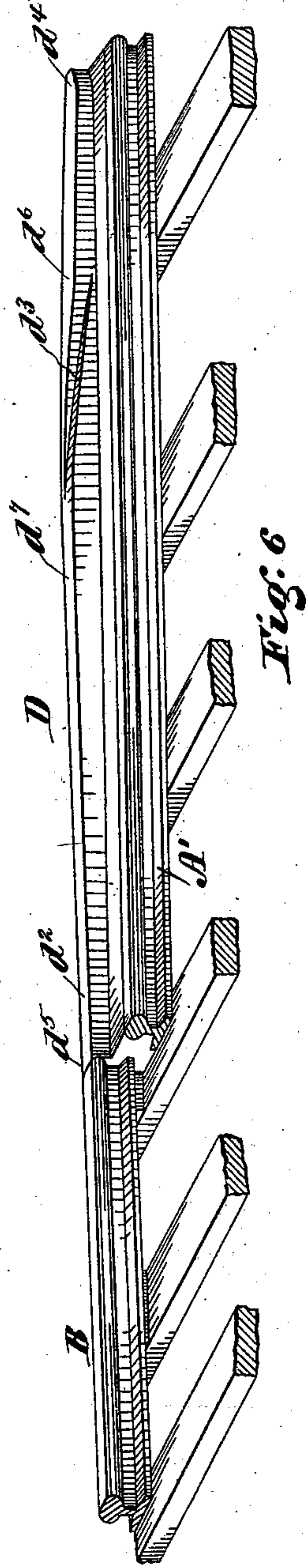


Fig. 6

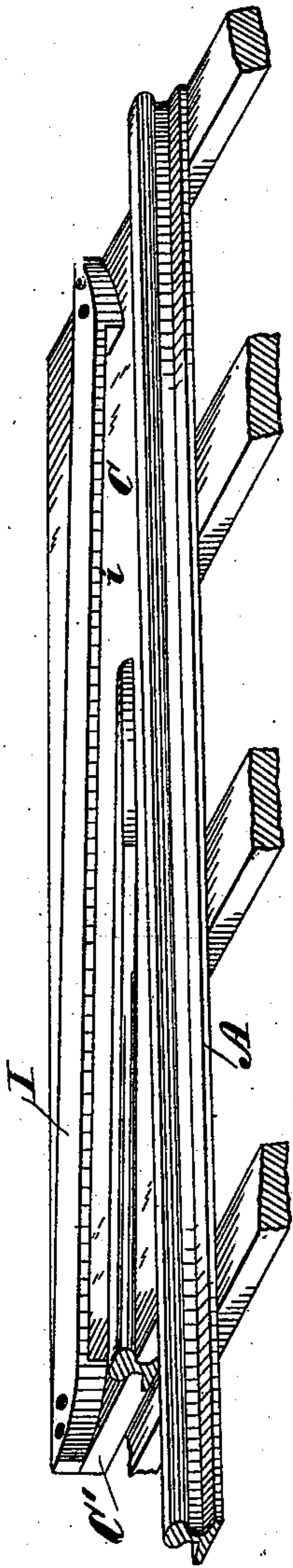


Fig. 7

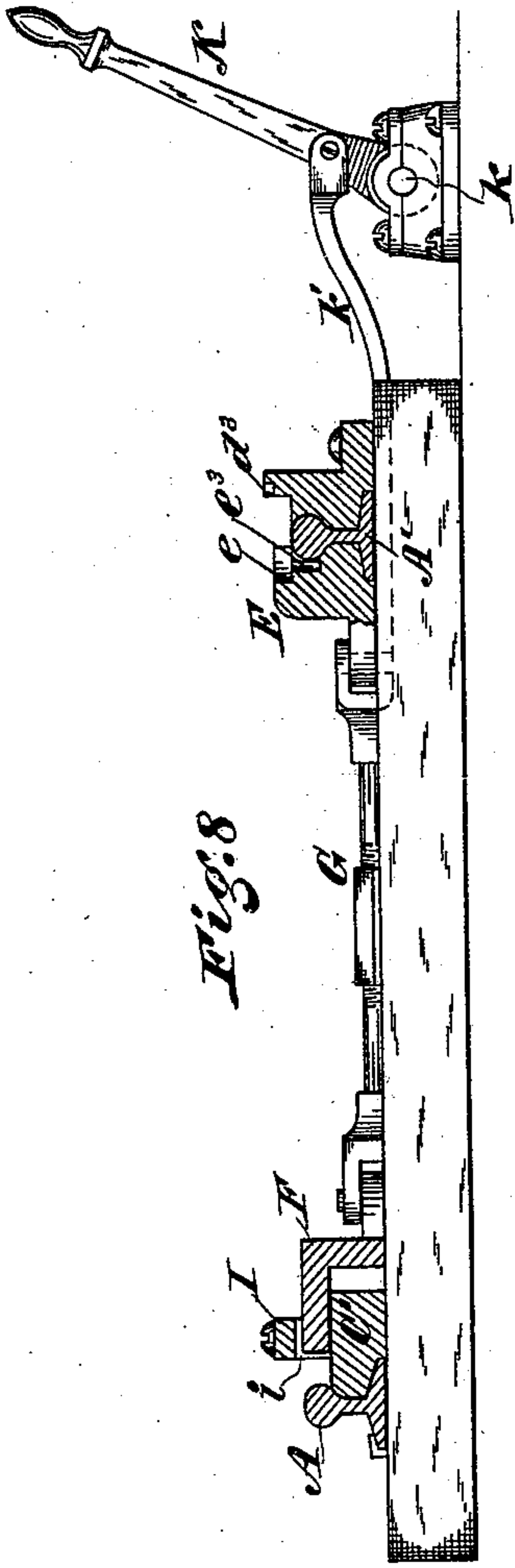


Fig. 8

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UNITED STATES PATENT OFFICE.

ORESTES PAGAN, OF PHILADELPHIA, PENNSYLVANIA.

SAFETY AUTOMATIC RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 229,745, dated July 6, 1880.

Application filed November 7, 1879.

To all whom it may concern:

Be it known that I, ORESTES PAGAN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Safety Automatic Railroad-Switch; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figures 1 and 2 are plans, respectively showing the switch closed and opened. Fig. 3 is a plan of the main and side tracks with switch removed. Fig. 4 is a perspective of the switch-rails. Fig. 5 is a side elevation of switch and main rails E and A', respectively, the former being partly in section. Figs. 6 and 7 are respectively perspectives of the siding-extension and frog and guard-rail; and Fig. 8 is a transverse vertical section on line 1 1, Fig. 1.

My invention has for its object to provide a switch by means of which the side tracks as well as the main track will be left unbroken and uncut and spiked fast to the sleepers or cross-ties without making a switch of the points of the siding, as heretofore done, which will operate automatically, so that a car running in either direction on the main track or running from the siding to the main track will open it if closed, and which will demand personal service only when it is required to shift a car, engine, or train from the main track to the siding.

My invention consists in the peculiar construction and combination of parts hereinafter described, having reference to the following points: first, to the combination, with the continuous permanent main rails of a track and a siding, spiked or otherwise permanently secured to the cross-ties, of separate and detached movable switch-rails, whereby transfers may be made from said main rails to the side rails without moving either of the latter; second, to the provision of an extension of one of the siding-rails, which is formed with two treads, and is extended along the main rail for a considerable distance after its junction or meeting with the latter, having on the side adjacent to the main rail a level tread for the car-

wheels running straight on said main rails and a rising tread for the car-wheels to ride on in transferring from said main rails to the siding, and vice versa; third, to the peculiar construction of the switching-rails, which are each pivoted at one end and connected by cross bars or braces, so as to move simultaneously, one of said rails being adapted to move beneath a cover which forms both a guide and a guard rail, and the other having an incline upon which the flange of the wheel mounts when moving to the siding, said switch-rails being also so constructed as to be automatically shifted to open or move away from the main rail by a car or engine moving in either direction over said main rails; fourth, to certain details of construction hereinafter set forth.

Referring to the accompanying drawings, A A' indicate the main rails of a track, said rails being unbroken or uncut and spiked or otherwise permanently secured to the cross-ties. B B' are the rails of a siding, which are in like manner permanently secured to the cross-ties through their whole length, thus not making a switch of their extremities, as hitherto, one of said rails running to a frog-plate, C, of peculiar construction, having a laterally-extending base, C', which supports one of the movable switch-rails hereinafter described. One of said siding-rails, B, is formed or provided with an extension, D, which is of the peculiar construction shown. It is in the first place formed with a depressed tread, d , which is mainly of the same height as the tread of the main rail, never rising above it, and rests close up to the latter, leaving a space between the main rail and the vertical side of the upper tread of this rail equal to the width of the tread of the car-wheels, so as to be run on by and form a support to the wheels of trains passing straight over the main track in either direction. It has also an upper tread, d' , which rises on an incline, d^2 , from the siding-rail B at one end, and on another incline, d^3 , at or near the opposite end, being of such altitude between the inclines d^2 d^3 , or at their apex or point of convergence, that when the wheel of a car is on said upper tread its flange will be above the lower tread and clear of the top of the main rail. The extension D is also con-

tinued beyond the lowest point of the incline d^3 , so as to form a guard, d^4 , for purposes hereinafter set forth.

E and F are the switch-rails, which are connected by swivel-braces G G, whereby said rails may be adjusted toward and from each other. Said rail E is pivoted or bolted to a cross-tie of the main track at h , and the rail F on a lateral lug, e , of the frog C, so as to turn on said pivots as fulera. The rail F is in cross-section L-shaped, and substantially the same section throughout, although I do not limit myself to any particular form for this rail. It is adapted to move laterally beneath another rail, I, which is bolted to the laterally-extending base C' of the frog C.

The rail I is formed with an undercut slot or opening, i , for the passage of the switch-rail F, and forms a cover thereto as well as a guard and guide-rail, as hereinafter specified.

The switch-rail E is of the peculiar form shown, its inner side forming two curves, e e' , which, from their junction, at or about the point e^2 , recede from the adjacent main rail, so that the respective ends of said rail are the points in said curves farthest from the main rail when the switch is open for the main track.

On the side of the rail E adjacent to the nearest main rail is formed an incline, e^3 , which begins at the end e^4 of said rail, near its bottom, and terminates at or about the point e^5 and flush with the top of the rail A'.

The curve e is coincident with a line drawn in continuation of the side rail, B, from the point b , and crossing the main rail, or substantially coincident therewith, and the extent and rise of the incline e^3 are so proportioned with respect to the extension D that in moving from the main track to the siding the flange of the wheel will rise upon and move along said incline e^3 ; but before said flange leaves the latter the tread of the wheel will meet and ride upon the incline d^3 of the siding-extension D, thereby transferring said wheel from the switch-rail to the siding without contact with the main rail.

K represents the switch-lever, fastened to a rock-shaft, k , which connects by jointed arms k' k' with the switch-rail E, so that by vibrating said lever said switch-rail may be moved toward and from the main rail, as required. Said lever is devoid of any weight, spring, or locking device, and is purposely made so for a purpose hereinafter set forth.

The operation is as follows: The parts occupying the position shown in Fig. 2, the switch is open for the main track, and cars may pass over said main track in either direction without impediment from the switch, the tread of said wheels on the side adjacent to the siding riding on or over the tread d of the extension D as they pass the latter. In this position of the parts a car may move from the siding to the main track, as in so doing the flange of one of its forward wheels will strike the edge f of the switch-rail F, moving the latter and the other switch-rail into the posi-

tion shown in Fig. 1, which is the proper position for transferring to and from the siding, as hereinafter set forth. So, too, if the switch should be in the position shown in Fig. 1 and be unattended and uncontrolled, a car coming in either direction on the main track will open it. If such car approach from and in the direction of the arrow x , the flange of its forward wheel on the rail A' will meet the curve e' of the rail E and open the switch. Should such car approach from the contrary direction—*i. e.*, from and in the direction of the arrow y —the flange of its forward wheel will meet the curve e of said rail and will open the switch. In both such cases the opening of the switch is accomplished by the movement of the rails E F on their fulera in the direction of or toward the rail A'. Hence, no matter what the position of the switch, whether open or closed, if unattended, it offers no impediment or obstruction to the movement of a car in either direction over the main track, and if opened for the main track will be automatically set right for the siding by a car moving from the latter to the main track.

The only occasion when the switch requires attention and service is when it is desired to transfer a car from the main rail to the siding. Then the parts are moved to occupy the position shown in Fig. 1 by throwing over the lever K until the switch-rail E comes against the main rail A'. The switchman will retain the lever in this position by holding it there until the desired transfer has been made. When the parts are so held the car will be approaching from and in the direction of the arrow y . The flange of the wheel on the rail A' will meet and rise upon the incline e^3 , the curve e at the same time guiding said wheel toward the siding until its tread meets and rides upon the incline d^3 , when it will ascend this until the flange of the wheel leaves the incline e^3 , the transition being effected without contact of any part of the wheel with the main-track rail A', the wheel riding first by its flange on the switch-rail incline, and then by its tread on the stationary siding-extension.

What I have described as the depressed tread of the switch-extension, on which the tread of a wheel rides in passing directly along the main track, serves also another purpose—*viz.*, to assist the transfer of the wheel to and from the siding. Being inclined upwardly from its outer or siding end toward its junction with the main rail, the flange of the wheel, when a transfer is being made, rides upon it, and the transition from the siding-rail to the main rail, and vice versa, is thus rendered easy and gradual. This is of particular importance where the siding forms a short curve with the main rail, the upper tread of the extension D being too limited in length in such case to permit as gentle a transfer as is desired without assistance from the incline of the depressed tread. The upper tread of the extension D is, however, in all cases, a curve through a horizontal plane, (or

two inclines approximating such curve,) the terminals of such curve being at or about the points d^5 d^6 , and its apex being at or about d^7 . Thus it will be noted the movement of the wheel across the main track is practically by a curve passing at two points through the plane of the upper surface of the main rail, said curve being vertically in line with the siding-rail, forming, with the main rail and on the opposite thereof, the same angle as such siding-rail does.

This switch has the following merits: Both rails of the main track are entirely unbroken, and the whole of the side track entirely undisturbed and continuous as far as the joint with the main track, there being no movable switch-points, as generally used. By thus providing a perfectly solid and continuous rail on both the main track and the side track the shocks and jars, which are the unavoidable results of the open joints left in ordinary switches, are done away with, and there is consequently less wear and tear and more safety of the rolling-stock and of the rails themselves at those points. There being no movable portions of the track on either main track or siding, head-plates will be entirely dispensed with at these points, and the cross-ties will not require frequent attention to keep them level. Both switch-rails being situated inside of the main track, and the weight of trains not traveling over their surface, as it does on other switches known, they will naturally not suffer and will keep level—a great advantage over the switches heretofore used. Perfect safety and security are given to trains traveling either way on the main track, as well as those coming on the siding, no matter which way the switch may be set. This protection is so positive that there is no need of targets or other signals to indicate the position of the switch on either double track or single, nor even using any extra apparatus for the working of the switch, as generally required on single tracks with switches heretofore used.

Besides the accidents which are constantly occurring from the misplacing of ordinary switches, it has often happened that trains have been thrown from the track by the bending or breaking of the connecting-rods or some other part of the moving apparatus or rails. This can never happen with this switch, as the main track is absolutely immovable, and so is the siding, being both spiked down to the cross-ties, and the switch-rails, being both situated inside of the main track, are better protected, safer, and more solid, and avoiding the traveling over them that ordinary switches are subject to.

This switch gives absolute protection to the travel both on main track and siding, there being no movable part on either of the tracks, and being no more encumbrance than if there were no switch at all, only being used and attended for the sole purpose of transferring cars from main track to siding.

Trains coming in either direction on the

main track or coming on the siding will always find the track clear or set the switch right themselves without the use of extra appliances or counter-weights, as switches generally have to have on single tracks.

That portion of the extension D which projects beyond the incline d^3 serves as a guard to protect the wheels of cars from running off over the main rail in passing from the siding to said main rail.

The stationary guard-rail I serves to guide the wheels of cars, &c., in passing from the main track to the siding when the switch is adjusted and held for that purpose. Thus, the switch being opened to the siding and held so by the switchman or attendant, the wheels moving on the adjacent main rail rise on their flanges on the incline e^3 of the switch-rail E, as already described. At the same time the wheels on the opposite side of the car and on the other main rail are guided toward the inner side of the point of the frog C, and as they bear, by their inner faces, against the outer vertical side of said stationary rail I, the wheels on the incline e^3 are prevented from slipping or moving laterally off the latter.

If desired, the switch-rail F and its swivel-brace connections may be dispensed with, the single movable rail E and stationary guide-rail I only then forming the switch. If this be done, it will then be necessary for a switchman or attendant to hold the switch in the proper position when cars are moving off the siding onto the main track, as well as when moving from the latter onto the former.

When the switch-rail F is employed it not only operates to open or set the switch right for cars moving off the siding onto the main track, but also to hold the switch-rail E in position while such transfer is being made.

What I claim as my invention is—

1. The combination, with a continuous permanently-fastened main track and a stationary or immovable siding, of a movable switch-rail separate and detached from said main track and siding, and operating to effect the transfer of car-wheels from said main track to said siding, and vice versa, substantially as set forth.

2. In combination with a main track and siding, both stationary or permanently fixed in position, an extension, D, of said siding, having a tread raised above the plane of said main track and inclining toward either end, substantially as set forth.

3. The movable switch-rail E, having incline e^3 on its free or movable end, and on the side adjacent to the nearest main rail A', substantially as shown and described.

4. In combination with main track A A' and siding B B', a movable switch-rail, E, located inside of said main track, having an incline, e^3 , the vertical side of which is a curve or approximate line, e , forming a continuation of the line or curve of the siding, substantially as set forth.

5. The movable switch-rail E, whose inner

side is curved or bounded by two converging lines, so that at either end it recedes from the adjacent main rail, whereby it is capable of being opened by a car approaching in either direction on the main track, said switch-rail being separate from and forming no part of either the main or siding track, substantially as shown and described.

6. The combination, with the permanent continuous main rail A' and stationary siding-rail B, of the extension D, whose upper surface is above the plane of said main rail and is inclined at either end, and the movable switch-rail E, having an incline, e^3 , whose vertical wall e is in the same, or approximately the same, line or plane as the siding-rail B, substantially as shown and set forth.

7. The permanently-fixed siding-extension D, having two treads, d d' , the former mainly in the same plane as the main-rail tread, and the latter elevated thereabove and having an incline at either end, substantially as and for the purpose set forth.

8. The combination, with movable switch-rail E, located inside the main rails and independent thereof, of movable switch-rail F, also located inside of the main track and connected to said rail E, so as to move therewith, substantially as shown and described.

9. The combination, with movable switch-rail E, having incline e^3 , of stationary guide-rail I, serving to prevent the car-wheels moving on said incline from slipping laterally therefrom, as set forth.

10. The combination, with stationary guide-

rail I, and with the permanent and immovable main track and siding and a separate and detached switch-rail E, of movable switch-rail F, the former serving as a guard and cover to the latter, substantially as set forth.

11. The combination, with continuous stationary main rails A A' and permanently-fixed siding, of siding-extension D, having an upper and a lower tread, the former having an incline at either end, movable switch-rail E, having incline e^3 , movable switch-rail F, connected to rail E by braces G G, and stationary guide and guard rail I, substantially as shown and described.

12. The frog C, having laterally-extended base C', in combination with movable switch-rail F, pivoted thereon, and guard-rail I, bolted thereto, substantially as shown and described.

13. The combination, with a continuous and stationary main track and a siding permanently fixed, of a switch, substantially as herein described, adapted to open or set itself right automatically to wheels moving in either direction over the main track or off the siding to said main track, and when held, as described, by a switchman or attendant to effect the transfer of cars, &c., from the main track to the siding, as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of October, 1879.

ORESTES PAGAN.

Witnesses:

SAML. J. VAN STAVOREN,
CHAS. F. VAN HORN.