2 Sheets—Sheet 1.

J. BRIODY.
Railway-Switch.

No. 204,710. **Patented June 11, 1878.**

Fig. 1.

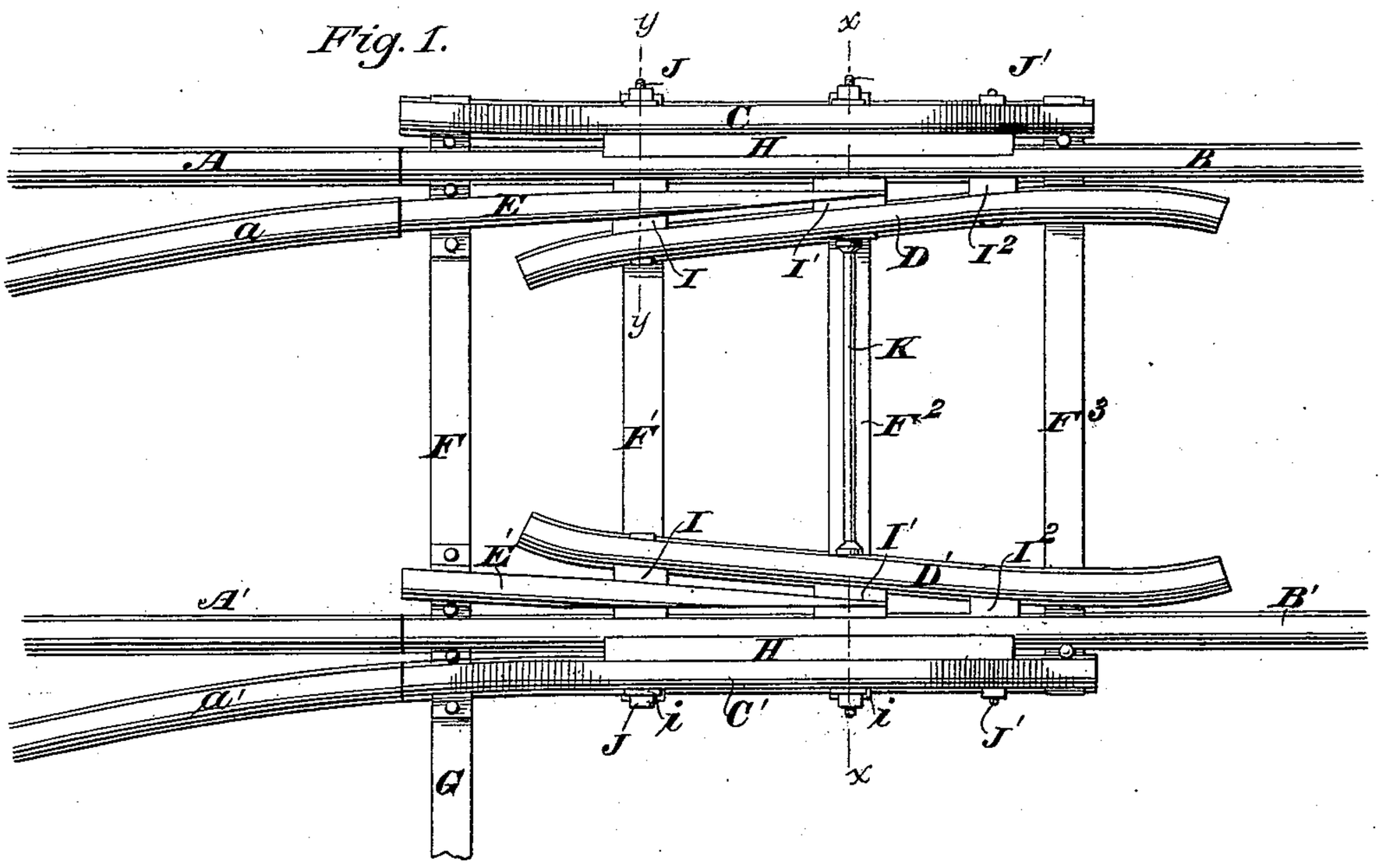


Fig. 2.

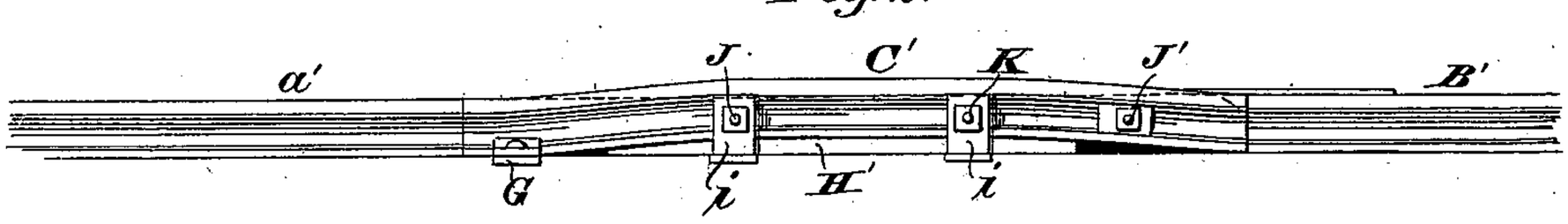


Fig. 3.

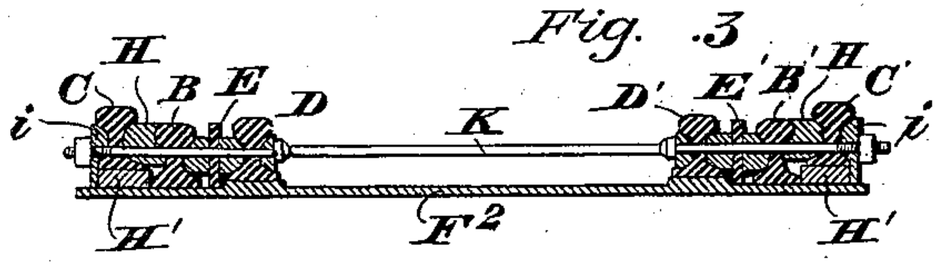
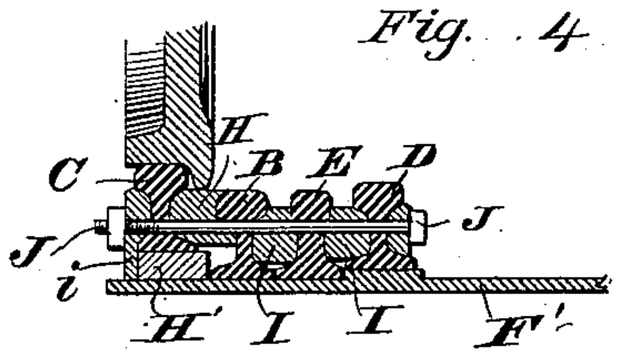


Fig. 4.



WITNESSES

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2 Sheets—Sheet 2.

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Railway-Switch.

No. 204,710. Patented June 11, 1878.

Fig. 7.

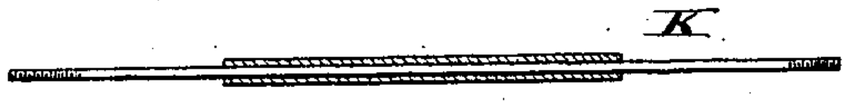


Fig. 6.

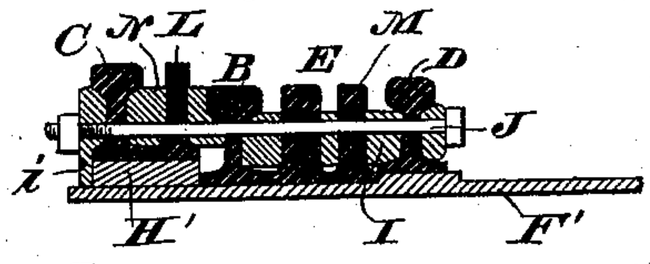


Fig 5.

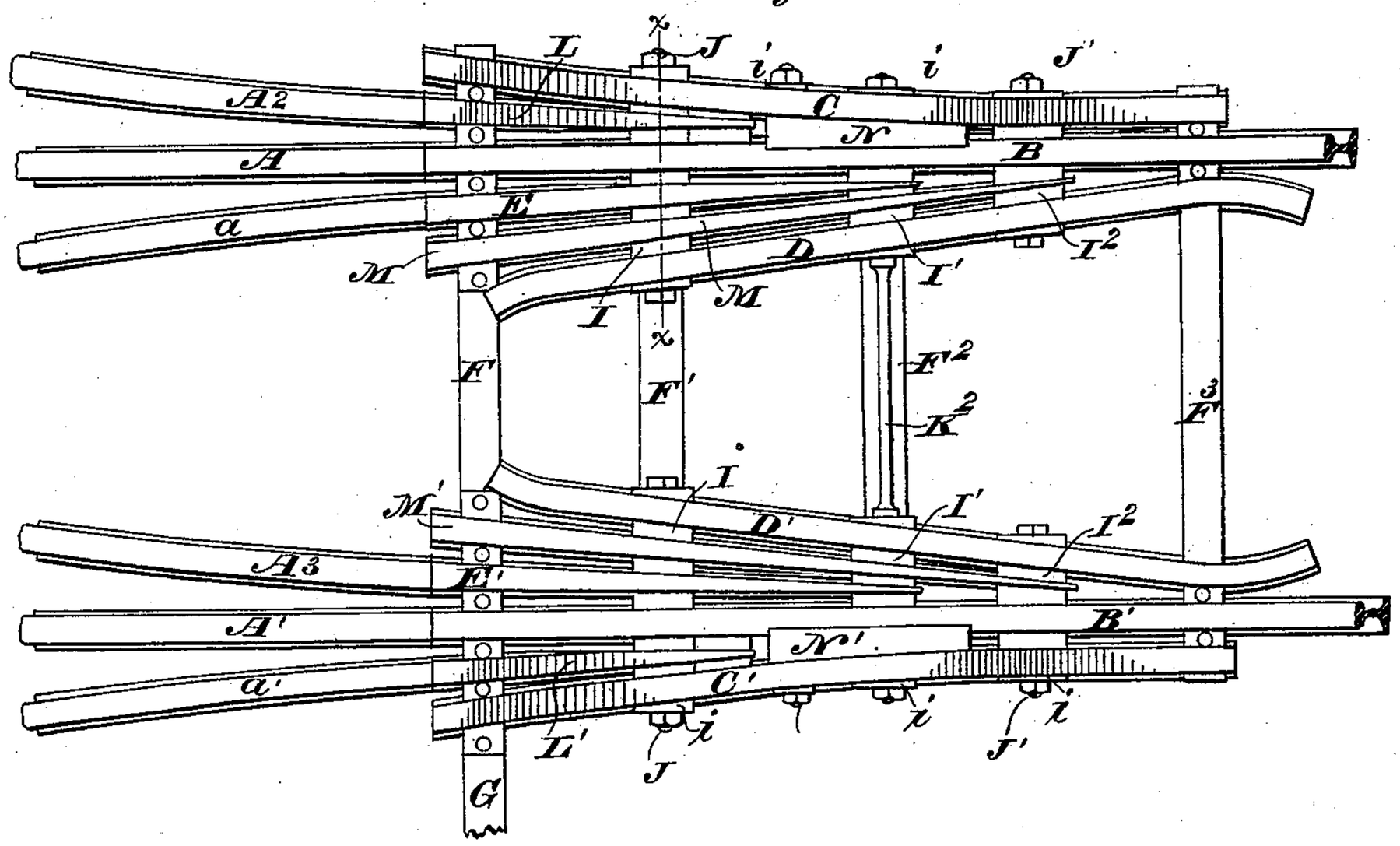
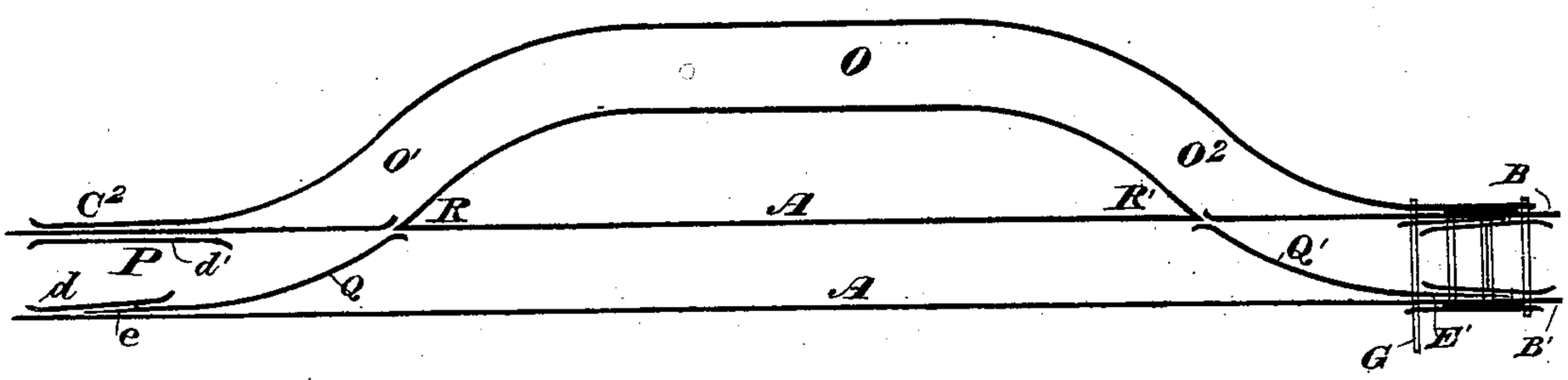


Fig. 9.

Fig 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES BRIODY, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-FOURTH HIS RIGHT TO BERNARD BRIODY, OF SAME PLACE.

IMPROVEMENT IN RAILWAY-SWITCHES.

Specification forming part of Letters Patent No. **204,710**, dated June 11, 1878; application filed December 31, 1877.

To all whom it may concern:

Be it known that I, JAMES BRIODY, of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Safety-Switches for Railways, of which the following is a specification:

My invention relates to a switch of that class which prevents the cars from being run off the track by neglect to properly adjust the switch. My objects are to give additional safety to such switches, and to lessen the liability of damaging the wheels of the cars of trains which may happen to pass by and over the switch and along the main track or rails of the road when the switch is set to run the cars upon the siding or switch-branch of the railway.

My improvements consist in certain peculiarities of construction, and in novel combinations of devices and arrangements of parts, which will first fully be described, and then specifically be designated by the claims.

In the accompanying drawings, which show a section of the railway sufficient to illustrate my invention, Figure 1 is a plan or top view of a single switch; Fig. 2, a side elevation thereof; Fig. 3, a vertical transverse section on the line *x x* of Fig. 1; Fig. 4, a similar section on the line *y y* of Fig. 1, showing a section of one of the wheels of a truck as passing over the switch. Fig. 5 is a plan or top view of a modification, showing a double switch, or one designed to accommodate three tracks; Fig. 6, a vertical transverse section on the line *x x* of Fig. 5. Fig. 7 is a longitudinal view, partly in section, of the sectional tie-rod and brace-bar for connecting the rails, &c., of the opposite sides of the switch-tracks. Fig. 8 is a plan or top view of a modification of the switch, whereby increased safety is attained. Fig. 9 is vertical transverse section through a modification of the filling-piece and bed-piece for separating the safety-rails and main rails, and for supporting the former.

The main-track rails A A^1 connect with both ends of the switch main rails B B′ when the switch is properly adjusted, as usual. Safety-rails C C^1, forming part of and adjustable with the switch, are formed alike, and respectively secured to the switch main rails B B′ outside of and at a short distance from them. Each of these safety-rails is raised at its middle and on each side thereof, so that its top is elevated above the level of the main-rail sections B B′ a distance equal to or a little greater than the depth of the flange of an ordinary car-wheel, (see Fig. 4,) and toward the ends inclined or curved from the level of the main rails A A^1 upward to its elevated part intermediate the ends. Curved guard or guide rails D D′, forming part of and adjustable with the switch, are secured inside of the switch main rails B B′. The top surfaces of these guards should be higher than the corresponding surfaces of the switch main rails. These guards each approach quite close to the main rails of the switch at and near one end, and at their opposite ends the guards converge toward each other, as usual.

Between the guard-rails and main rails of the switch are secured the usual safety-points E E′, for acting upon the wheel-flanges in switching off a train. These points are located between the main rails B B′ of the switch and those portions of the guards D D′ which are farthest from the switch main rails, the points terminating at their narrow or inner ends, near about the middle of the guard-rails, but some distance from those portions of the guard-rails which approach nearest the switch main rails.

The switch is secured upon and operated by any suitable and usual slide-bars or cross-pieces, such as those shown at F F^1 F^2 F^3, from one of which projects an arm, G, to adjust and secure the switch in the desired position, as well understood.

The safety-rails, guard-rails, and points may be made of any ordinary and suitable rails or sections of old rails; but the points are, by preference, made of steel.

The safety-rails C C^1 are each securely bolted to the main rails of the switch, and they are held at a fixed, and at all times immovable, distance apart relatively to each other, with a spacing-piece or long filling-washer, H, between the safety-rail and main rail of the switch. This spacing-piece is made of such a width or thickness horizontally as to hold the adjacent sides of the safety-rail and the main rail away from each other a distance sufficient to allow the wheels of a train to pass by and over the switch

when its main rails are in line with the track main rails without the treads or any parts of the wheels coming in contact with the safety-rails, or either of them; or, in other words, the distance between the safety-rails and main rails of the switch is as great as, or slightly exceeds, the width of that portion of the tread of a wheel which overhangs or projects beyond the main rail on the outside.

Supporting-strips or bed-pieces H′, preferably made of hard wood, are interposed between road-bed cross-ties or track-supporting timbers and the under side of the arched or raised portions of the safety-rails.

Instead of employing the long filling-washers or spacing-pieces H and the bed-pieces H′, made separately, short spacing-washers and supports for the safety-rails, made together, as shown in Fig. 9, may be substituted. The spacing-washers and supports made in single pieces in this manner may be arranged at proper distances between the safety-rails C C^1 and main rails B B′ of the switch.

Spacing-blocks or washers I I^1 I^2 are placed between the main rails B B′ and the guard-rails D D′, and between these rails and the points E E′, to properly separate them. Suitable screw-bolts J J′, provided with nuts, pass through these washers and the rails B B′ and D D′ and points E E′, and serve to firmly and detachably connect these parts. Lugs or lips on the slide-bar F embrace the safety-rails, the main rails, the guard-rails, and the points, and aid in holding them in their proper relative positions. Washers *i* are also, by preference, employed to embrace the outsides of the safety-rails. A tie-rod and brace-bar, K, is employed to connect the rails and points of the opposite sides of the switch to prevent spreading or contraction of the parts. I prefer to make this tie-rod and brace-bar in sections, as shown in Fig. 7, where are shown a rod with threaded ends to receive nuts on the outside of the safety-rails and a tubular brace-rod fitting over this rod, and of a length to have its ends abut against the insides of the guide-rails and form shoulders to prevent them from moving inward or toward each other. By the employment of this section-bar in connection with the other fastenings, the various parts of the switch, with the exception of its main rails, may be removed for repairs and replaced, or other parts substituted, without interfering with the running of trains over the track-rails A A^1 and main rails of the switch.

From the foregoing description, and with the aid of the drawings, a brief reference to the operation of my invention will be sufficient. With the switch adjusted, as shown by Fig. 1, trains will pass either way freely. When it is desired to run cars upon a siding, or upon another road or branch of the main road connecting with the main track by the rails *a a′* and switch, the switch main rails B B′ are respectively brought in line with the rails *a a′*, thus bringing the safety-rail C and point E′ in line with the main rails A A^1, with which they respectively connect. A train running in the proper direction will then be switched off onto the rails *a a′*. While the switch is thus placed, or if so adjusted carelessly or designedly at an improper time, should a train approach by the main track A A^1 from the opposite direction to that in which a train passes to be switched off, the peripheries or treads of the wheels on one side of the train will pass from the rail A to the safety-rail C, and the wheels in turn bear solely upon their treads only on this rail, with their flanges elevated above the spacing-piece or filling H. At the same time the wheels of the opposite side in turn pass to the safety-point E′ in line with the main or track rail A^1, with their flanges between this point and the guard-rail D′. As the train moves on, the flanges of the wheels which enter upon the point from the track A^1 come, in turn, in contact with the guard-rail D′, which causes them to move gradually and slightly sidewise toward and upon the switch main rail B′, drawing the wheels which run upon their treads on the safety-rail C in the same direction inward or toward the center of the track until the time when the flanges of the wheels which have been respectively deflected from a direct line of travel and caused to bear with their treads upon the switch main rail B′ approach quite near to and come between the end of the guide-rail D′ nearest the switch main rail B′, at which time the flanges of the wheels of the opposite side pass across the switch main rail B, and reach the proper position for their treads to run upon said rail. Should a train approach by the branch road or siding-rails *a a′* when the switch is in the position shown by Fig. 1, the wheels would pass to the main rails of the switch, and so to the main track, as will be apparent from an inspection of the drawings. The switch cannot be so adjusted as to throw a train from the track in whatever direction it may be running, or whether approaching by the main road or by the connecting road or siding.

In Figs. 5 and 6, which represent a modification of my invention, I have shown a double switch, or one adapted for use in connection with three tracks, two of which are represented by the rails A A^1 and *a a′*, as previously described, and the third represented by the rails A^2 A^3. The switch main rails B B′, the safety-rails C C^1, the guards or guide-rails D D′, and the points E E′ are all the same, or substantially the same, as those already described. The additions made consist in extra short points L L′, respectively secured between the switch main rail B and safety-rail C, and between the switch main rail B′ and safety-rail C^1, and extra long points M M′ secured between the points and guard-rails E and D and E′ and D′, respectively. The extra points L L′ are inclined at their abutting ends, or next the main rails A^2 *a′*, like the safety-rails, and at and toward their opposite or narrow por-

tions are raised and about on the level of the safety-rails. This modification of the switch as adjusted in the drawings admits of the passage of trains in both directions. The wheels of cars which approach the switch by the main rails A A^1 of the railway pass to the main switch-rails B B′ freely. Trains approaching by the rails *a a′* pass to the main switch-rails B B′ by the supplementary point L′ and the point E. The sides of the flanges of the truck-wheels of one side of the train come in turn in contact, first, with the inner side of the supplementary point M, and then in contact with the inner side of the guard-rail D, and the wheels are thus deflected sidewise by the point M, and caused to run upon the switch main rail B, and from thence to the rail of the main track in line therewith, while the treads of the wheels beneath the opposite side of the train pass first from the rail *a′* upon the extra point L′, which also serves as a supplementary safety-rail, next upon the safety-rail C^1, and are then forced over upon the switch main line B′. Too great deflection from a direct line of travel is prevented by the flanges of the wheels of one side coming in contact with the points M′ and the guard-rail D′, as well as by the flanges of the wheels of the opposite side coming in contact with the side of the switch main rail B. The treads of the wheels of trains passing to the switch by the rail A^2 run first upon the extra point and supplementary safety-rail L, next upon the safety-rail C, and are then deflected by the point M′, acting upon the flanges of the wheels of the opposite side, so as to bring the wheels of the opposite sides respectively upon the switch main rails B B′. Trains which approach from the opposite direction will be caused to pass to the switch main rails B B′, to the main or branch rails A A^1, or *a a′*, or A^2 A^3, according to how the switch is adjusted, as will readily be understood from the drawings and foregoing description.

The filling-pieces or spacing-strips H and N N′ should be made of metal, so that in event of the safety-rails C C^1 and the combined points and safety-rails L L′ becoming considerably worn the wheels of one side may run on their flanges, as transferred to the switch main rails. It is not, however, intended that the wheels should so pass by their flanges to the switch main-rails ordinarily, but only in event of unnoticed wear, and so to prevent accident.

In Fig. 8 I have shown the adjustable switch represented by Fig. 1, and before described, in combination with a siding or turn-out, O, and a fixed switch, P. This fixed switch is provided with the centrally-raised outside safety-rail C^2, similar to those, C C^1, before described, with the point *e* serving the purpose of one of those, E E′, before described, and with a guard or deflector rail, *d*, answering the same purpose as one of those, D D′, before described.

As an additional precaution against accident, a guard-rail, *d′*, is employed to counteract the natural tendency of the train to serge toward *e* and jump the track. The diagonal rail Q abuts at one end against the point *e*, and leads to the frog R at the end O^1 of the siding. A diagonal rail, Q′, bridges the track diagonally between the point E′ of the adjustable switch and the frog R′ at the opposite end O^2 of the siding. These frogs are arranged at the junctures of the inner siding-rail and the adjacent rail of the main track.

From this description it will be obvious that the addition of the fixed switch P does not render necessary any change whatever in my improved switch shown by Fig. 1, while enhancing the value of the invention. In the position of the adjustable switch in which it is shown in the drawing, trains would pass freely along the track in either direction. Cars on the siding would pass at all times freely to the main track by the fixed switch. If the adjustable switch were misplaced or left in the switching-off position, a train which passed by it to the siding could move on without loss of time, and be transferred, as already fully explained, to the main track, were the siding clear, by the fixed switch, while at no time can trains running in the opposite direction pass to the siding by either switch. By making the siding long enough, and by keeping any cars which may have been switched off upon it at or near the end O^1, time will be afforded, even when the siding is occupied, to stop or check the train and avoid collisions.

I am aware that switches have heretofore been constructed with rails on which, in some cases, the wheels of trains are caused to run on their treads, and in others on their flanges, in transferring trains from one track to another track or siding; and I make no claim to either of such devices, broadly considered; nor do I claim every way of combining such or either of said forms of rails with other parts of a switch or with the track-rails; but

I claim as of my invention—

1. The combination, in a railway-switch, of the switch main rails and the outside safety-rails, having inclined ends and raised middle portions, and occupying at all times fixed positions relatively to each other and to said main rails, substantially as and for the purpose set forth.

2. The combination, in a railway-switch, substantially as hereinbefore set forth, of the elevated safety-rails for supporting the wheels upon their treads, the main rails, the upper surfaces of which are located below the level of the corresponding surfaces of the safety-rails, the guard-rails, and the points.

3. The combination of the switch main rails, the inside guard-rails, the points intermediate the switch main-rails and guard-rails, the outside elevated safety-rails to support the wheels on their treads, and at all times occupying fixed positions relatively to each other and to the switch main rails, the rails of the main track, and the rails of the branch or siding

track, all substantially as hereinbefore set forth.

4. The combination of the switch main rails, the elevated safety-rails, the elevated guard-rails, the points, and the sectional tie-rod and brace-bar, these members being constructed and operating substantially as hereinbefore set forth.

5. The combination, substantially as hereinbefore set forth, of the switch main rails, the elevated outside safety-rails, the inside guard-rails, the points E E′, the combined points and safety-rails L L′, and the points M M′, whereby the switch is doubled and adapted to accommodate three tracks.

In testimony whereof I have hereunto subscribed my name.

JAMES BRIODY

Witnesses:
ALEXANDER G. COMSTOCK,
OTTO STARCK, Jr.