

No. 725,401.

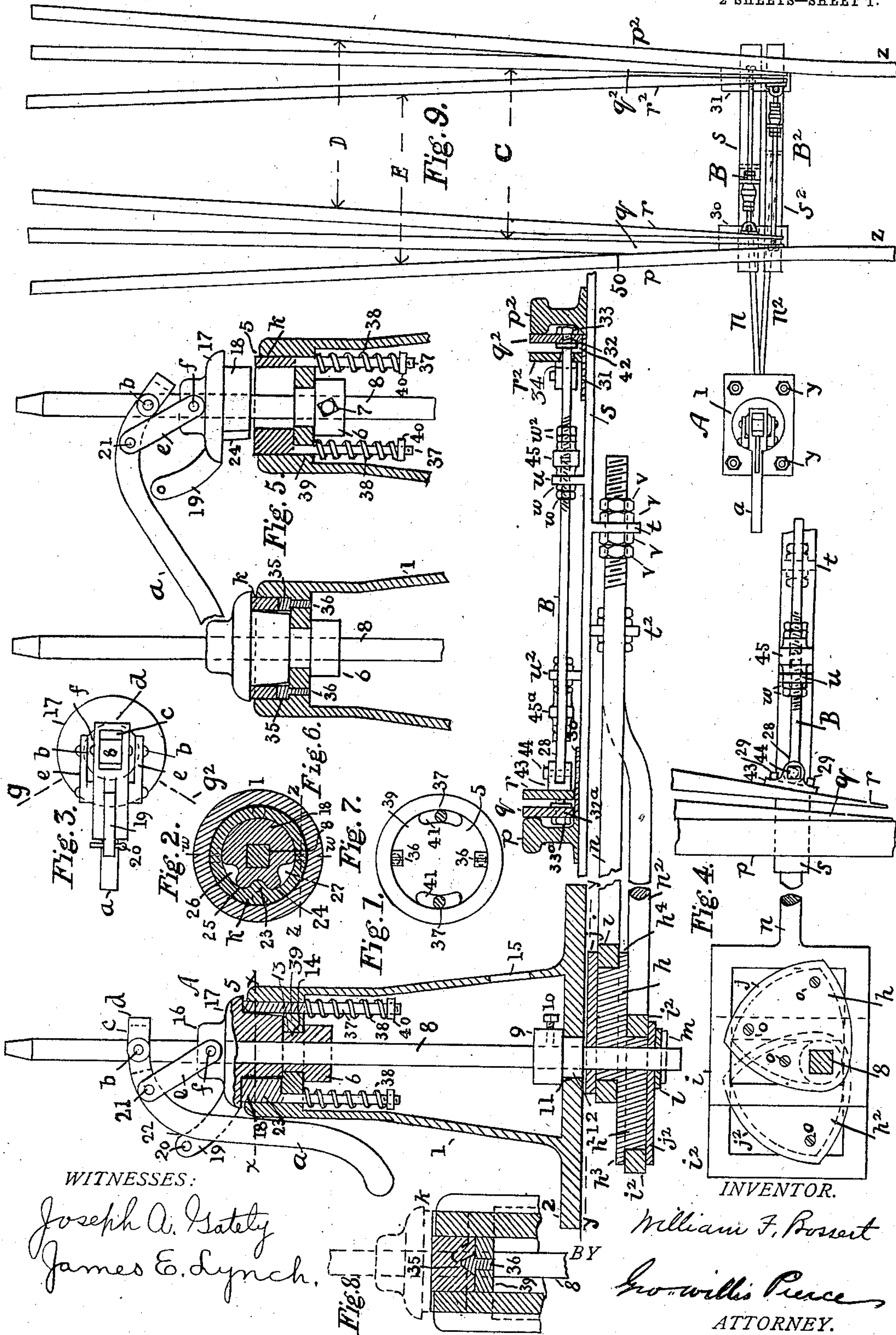
PATENTED APR. 14, 1903.

W. F. BOSSERT.
RAILWAY SWITCHING APPARATUS.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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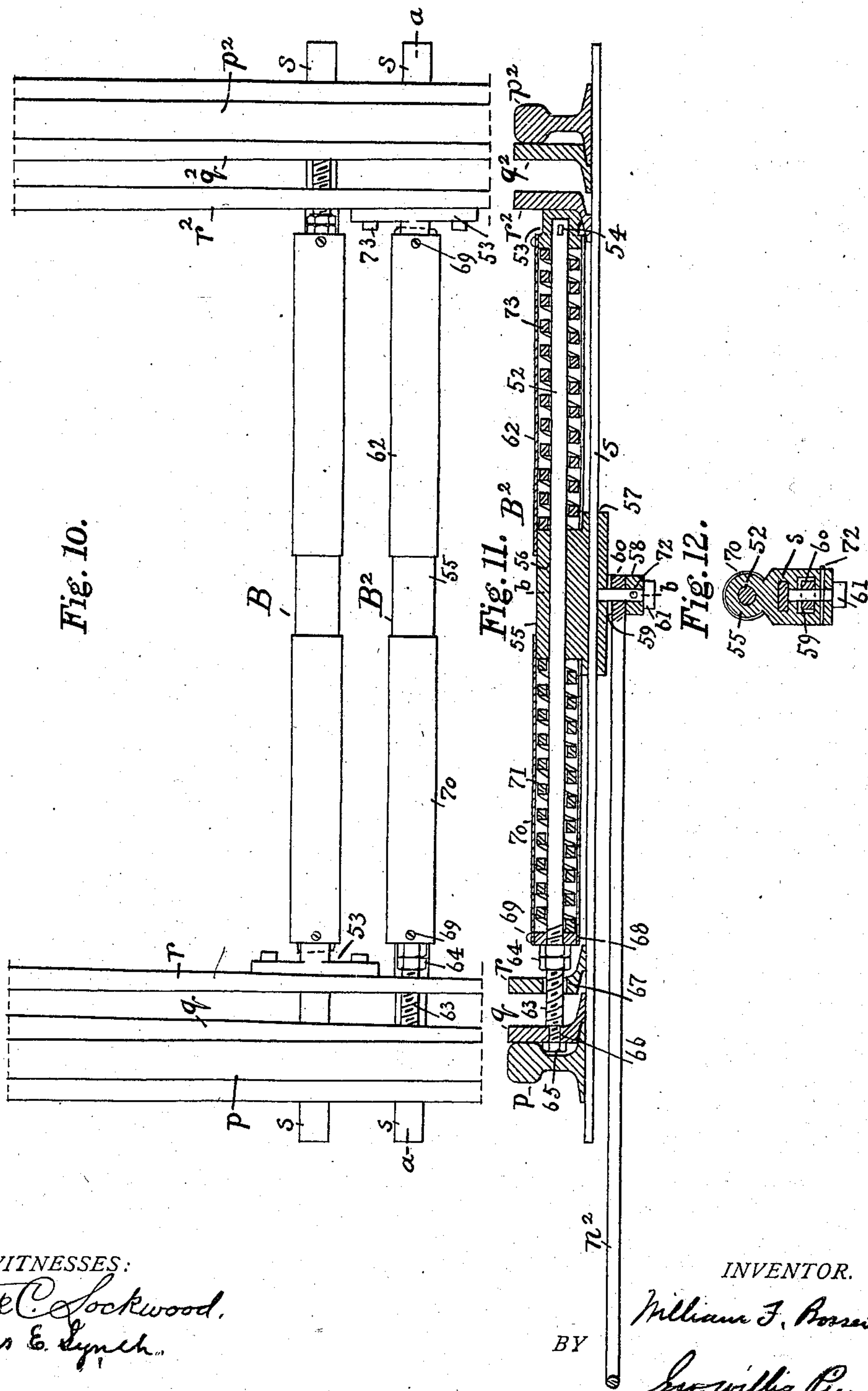
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WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM F. BOSSERT, OF UTICA, NEW YORK, ASSIGNOR OF ONE-THIRD TO
HENRY P. CROUSE, OF UTICA, NEW YORK.

RAILWAY SWITCHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 725,401, dated April 14, 1903.

Application filed December 8, 1902. Serial No. 134,280. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BOSSERT, residing at Utica, in the county of Oneida and State of New York, have invented certain Improvements in Railway Switching Apparatus, of which the following is a specification.

The present invention relates to railway-switches by means of which cars are transferred from one pair of rails to another, and has special reference to improvements upon switches which control a main track and divergent tracks upon each side thereof, in which there are four movable points—two upon each side adjacent to the outer or stock rails—one of the points on each side being movable together and connected together for that purpose by an upper bridle-bar, which is locked to a lower bridle-bar provided with an operative extension from the switch-stand. There are thus two pairs of points connected by bridle-bars adapted to be moved independently of one another from the switch-stand, which when in a central position completes the main track and at the same time opens the connection to each divergent track and when moved to the right or left opens the main track and closes the points of one divergent track, leaving the other divergent track open. In such switches the ends of the points have to be brought to a fine taper end in order to present a smooth rail continuation to the wheels of cars approaching the point ends, and all of the points are of the same length or are in line with one another, and in whatever position the switch may be set the rails and points form a guard and a guide for the car-wheels.

The invention also relates to the construction of the switch-stand and the connections thereof with the points of the rails, all of which I will now proceed to describe and point out in the claims appended hereto.

In the drawings which form a part of and illustrate the invention, Figure 1 is a sectional view of the switch-stand and of the operative parts connected with the rails. Fig. 2 is a section on line *xx* of Fig. 1. Fig. 3 is a plan or top view of the switch-stand. Fig. 4 is a section on line *yy* of Fig. 1. Fig. 5 is a section of the upper part of the switch-stand. Fig. 6 is a section on line *ww* of Fig. 2. Fig. 7 is a plan view of the top of the stand, the

parts being removed. Fig. 8 is a section on line *zz* of Fig. 2, and Fig. 9 is a plan view of the main track and of a divergent track on each side thereof; and Figs. 10, 11, and 12 are views of a modification of the upper bridle-bar, Fig. 10 being a plan, Fig. 11 a section on line *aa* of Fig. 10, and Fig. 12 a section on line *bb* of Fig. 11.

In the drawings, A represents the switch-stand and is composed of a base-plate 2, secured to a suitable foundation at one side of the rails by the bolts *y y*, and bears the hollow tapering body 1, cast, preferably, integral therewith, and central of the body part in the plate is a round bearing 11, and at the upper end there is a second bearing 13 in the floor 39, between which and the upper end of the stand is a circular chamber 5, in which, fitting easily, is the ring *k*, having a rounded extension 23 thereinto from one side. A square rod 8 extends through the said body 1 and is provided with the bushings 6 and 9, whose reduced ends 14 and 12 fit into the respective bearings 13 and 11 and whose enlarged parts form abutments against the sides of the said bearings. Each bushing is held to the rod 8 by its set-screws 7 and 10. Fitting into the ring *k* is a movable locking-piece 17, having an extension 18, whose main part is of the same diameter as the interior of said ring, its lower edge being somewhat tapering, as shown, while the remainder is made into the two projections or teeth 24 and 25, with the open spaces 26 and 27 on each side and the space between them normally filled by the projection 23. The piece 17 is adapted to be moved upon the bar 8 by means of the lever *a*, pivoted at *b* to the said bar, and the links *e*, one on each side, pivoted to the lever at 21 at one end and by their opposite ends at *f* to the sides of the reduced upper part 16 of the locking-piece, which has a cap portion covering the top of the stand 1. The lever *a* has a mortise in its central part, through which extends the lug 19, provided with a pin 20, or, if desired, a padlock, to prevent the lever from being raised, and the upper ends of the lever embrace or loop the sides of the bar 8 and have a connecting-piece *d* across their ends to stiffen them at a sufficient distance to allow for an open space or loop *c*.

Fig. 5 represents the lever a raised and the locking-piece elevated from the chamber 5. Openings 15 may be made in the side of the body 1, so that the bushings 6 and 9 may be attached and detached, which may be closed by plugs, if desired. The bar 8 extends below the plate 2 and has attached to the extension the double cam h h^2 , or rather the two cams h and h^2 , which are preferably cast or forged in one piece, having a square hole for the reception of the bar 8. Between each cam is a flange h^3 h^4 , which extends beyond their faces, and on the top of the cam h is a plate j , whose edges extend beyond the cam-face, and a similar plate j^2 covers the under side of the cam h^2 . Both plates j and j^2 are secured in place by the flush-headed screw-bolts o o . Each cam h and h^2 is provided with an inclosing square frame i and i^2 , respectively, to which are attached the switch-rods n and n^2 . The cams are adapted to work in the frames and are so related to one another that when the rod 8 is turned to the right the cam h moves in its frame, but does not extend the rod n , while the cam h^2 carries its frame i^2 to the right and of course the rod n^2 , and if the rod 8 is rotated to the left the rod n is carried in that direction by the cam h , while the rod n^2 and cam h^2 are not relatively moved. These results are affected by disposing the cams as indicated in Fig. 4. The rod is at the lower side of the cams and central to both of them—that is, the cam h is ready to throw to the left and the cam h^2 ready to throw to the right—and when either moves in a direction to throw the other one while rotating does not throw its frame, because a circle of a constant radius comes to the frame, and the mate does throw its frame, because a circle of increasing radius is brought against its frame.

In Fig. 9, p and p^2 represent the outside or stock rails, q and q^2 are the movable points of the main-track rails, and r r^2 are the movable points of the divergent tracks. The rails z z are the main-track rails approaching the points and in the position shown are continued by the points q q^2 to form the main track C; but when connected with the points r and p^2 the rails z z form a part of the divergent track D and when connected with the points p and r^2 form a part of the divergent track E. The points r and q^2 are connected by the bridle-bar B, provided at the point r with the flat perforated end 28, secured to the two-eared lug 43 by the bolt 44. The lug is fastened to the point by the bolts 29, while at the opposite end is the shoulder 42, outside of which the bar is screw-threaded, and the bar passes through a hole 34 in the point r^2 and through a hole in the point q^2 and has a nut 33 upon its end which bears upon the outside of the point q^2 . The bridle-bar B is divided into two lengths. One passes through the lug u , extending upward from the lower bridle-bar s , and has upon one side of the lug the nuts w w to hold said length to the lug,

and its end is joined to the second length by a turnbuckle 45. The respective ends of the said lengths are right and left threaded. The nuts w^2 are screwed against the turnbuckle. The lower bridle-bar s is rectangular in cross-section and extends across the tracks under the points and outer rails and is adapted to slide freely. The points rest and move upon the plates 30 and 31, secured to the cross-ties in a suitable manner. Depending from the under side of the lower bridle-bar s is the lug t , through which extends the threaded end of the rod n , connected with the frame i of the cam h , and upon each side of the lug are the nuts v v to hold the bar to the lug. The cam-rod n^2 is secured in like manner to the lug t^2 of a lower bridle-bar s^2 , which is attached by the lug u^2 to an upper bridle-bar B^2 , which is pivoted at one end to the point r^2 , while its threaded end extends through holes in the point r and in the point q and has the nut 33^a upon its end. The turnbuckles 45 and 45^a permit the points connected by the bridle-bars B and B² to be adjusted as to their distance apart.

Depending from the opposite lower edges of the ring k are the rods 37, which extend through the curved slots 41 in the floor 39 of the chamber 5. Their ends are threaded and bear the nuts 40, and upon the rods are the spiral springs 38, bearing against the under side of the floor 39 at one end and against the nuts at the other end, and at right angles to the rods 37 across the lower edges of the ring are the V-shaped slits 35, into which fit the upper ends of the A-shaped hardened-steel pins 36, whose reduced lower ends are secured into holes in the floor 39. Ordinarily the springs 38 are set up so hard by the nuts 40 that the ring k is practically immovable, and when its tooth 23 is locked with the teeth 24 or 25 the rod 8 cannot turn; but under extraordinary conditions, to be hereinafter explained, the rod 8 may partly turn the ring k and the piece 17 and automatically return to its original position. In such a case when the rod 8 turns in either direction the ring k rides up on the pins 36 against the pressure of the springs 38, compressing the same, as shown in dotted lines in Fig. 8. The ring will not turn enough to bring the slits 35 away from the pins, so that when the rod 8 ceases to be turned the springs will bring the ring and the piece 17, locked therewith, back to its normal position.

The operation of the invention is obvious from the previous description. In the positions shown, which may be called the "normal" positions, the points are in position to complete the main track and the cams are in a neutral position, (neither one is thrown,) and the lever a of the switch-stand has its locking-piece 17 central of the projection 23, the whole apparatus being thus securely held in position. Now if it is desired to connect the rails z z with the divergent track D the lever a is unlocked and raised into position shown

in Fig. 5, lifting the locking-piece 17 from the projection 23, and the lever a is turned into the position of the dotted line g^2 and then lowered, so that the space 26 embraces the projection 23. By this operation the cam h is turned to the left, (looking at Fig. 4,) and it carries the frame i and rod n with it, and the point r is brought into contact with the point q on one side and the point q^2 is brought into contact with the point r^2 on the other side, thus completing the rail connection, and if it is desired to close the rails $z z$ to the divergent track E the locking-piece 17 is raised, as before, and turned in direction of the dotted line g and lowered so that the space 27 embraces the projection 23, and the cam h^2 forces its frame i^2 and rod n^2 over, so that the point q is in contact with point r on one side and the point r^2 is in contact with the point q^2 on the other side, and the rail connection is completed. In case a car should approach the switch from the divergent track E, the points being arranged as represented in Fig. 9, the wheels on one side will strike at the intersection of the rail p and point q at 50, while the wheels on the other side will continue on the inner side of the point r^2 , and the car will probably be derailed or greatly injure the track under ordinary arrangement; but under the construction of the invention the wheels will force the points $q r^2$ toward the right, as when the pressure of the car is applied to the point 50 the rod n^2 pulls the frame i^2 and causes the cam to turn and also the bar 8 and the ring k , and the piece 17, locked thereto, rises upon the pins 36, as previously explained, and when the wheel passes the point 50 the springs 38 return the locking-piece 17 and ring to their normal position, and the points also resume their proper relation to the rails and other points. The same results follow if a car approaches the switch on any track in the direction of the points when set relatively as shown.

It will be seen that by the arrangement described, where all the points are on a line with each other, there is no "open switch" in the sense that a car can be derailed in whatever position the switch is locked, and with the part of the invention just described added to the aligned points security in either direction is provided for.

A portion of the invention, as will be seen, relates to automatically-elastic means disposed between the rails and the locking portion of the switch-stand whereby when cars approach the switch from a divergent track, as described, the rails will open and close again, and the modification represented by Figs. 10, 11, and 12 refers to such means, and in the said figures the points q and r^2 are tied to each other by the rod 52, one end of which passes through the hole 67 in the point r and is turned down to a smaller screw-threaded terminal, which passes through a hole in the point q and secured by one or more nuts 65. The full-sized rod is threaded for

the reception of the nuts 64. At the opposite end the rod enters a hole in the lug 53 and is secured by the pin 54. The lug is provided with ears on each side and is bolted to the inner face of the point r^2 , (the rod can be pivoted to the lug, as shown in Fig. 1, if desired.) Midway of the rod is the block 55, having a longitudinal hole 56 in its upper part through which the rod 52 passes loosely, while the lower bridle-bar s extends through a square hole in the lower part of the block, and depending from the block is a lug 58, in which is an opening 59 for the reception of the eye end 60 of the cam-rod n^2 , secured therein by the bolt 61, which is held in place by the pin 72. On the inner side of the nuts 64 on the rod 52 is a collar 68, between which and the face of the block 55 is a heavy spiral spring 71, over which is a split tube 70 to protect the same. Between the lug 53 and the face of the block 55 nearest thereto is a heavy spiral spring 73, also provided with a split tubular protector 62, secured, as is the tube 70, by a screw 69. These springs are forced into place and form practically a solid rod, so that when the cam-rod is operated the points q and r^2 are readily moved; but when a car comes in toward the points from a divergent track, as previously referred to, the rod 52 is forced over against the pressure of one of the springs without necessarily moving the block 55 or the cam-rod. Both of the upper bridle-bars B and B² are made alike, so that a description of one is sufficient.

I may, if I choose, employ a solid head for the switch-stand without the springs shown and described and rely upon the modification to protect the apparatus or I may use the modification in combination with the spring device on the switch-stand.

I claim as my invention—

1. A locking device for a switch-stand consisting of a circular chamber in the top of the stand having a projection or radial tooth from the side of the chamber, a central operating-rod square in cross-section, a locking-piece adapted to slide up and down upon said rod composed of a lower part fitting into the said chamber and provided with teeth and spaces, and an upper part forming a cover for the said chamber.

2. A locking device for a switch-stand consisting of a circular chamber in the top of the stand having a projection or radial tooth from the side of the chamber, a central operating-rod square in cross-section, a locking-piece linked to a lever pivoted to said rod and adapted to be raised and lowered upon the rod, having a lower part fitting into the said chamber and provided with teeth and spaces and an upper part forming a cover for the chamber.

3. A locking device for a switch-stand consisting of a circular chamber in the top of the stand having a projection or radial tooth from the side of the chamber, a central square operating-rod, a locking-piece linked to a lever

pivoted to the said rod and adapted to be raised and lowered upon the rod by said lever, having a lower part fitting into the said chamber and provided with teeth and spaces, and an upper part forming a cover for the chamber, with a lug extending from the said cover and adapted to lock the said lever.

4. A cam device for throwing and retracting switch-rods, consisting of two integral cams, each having three operative edges, the rotating corners of each cam lapping one on the other so that one cam is turned to the right and the other to the left, each ready to throw, of a square operating-rod extending through the said cams, with a square frame for each cam, provided with switching extensions or rods.

5. A cam device for throwing and retracting switch-rods, consisting of two integral cams, each having three operative edges, the rotating corners of each cam lapping one on the other so that one cam is turned to the right and the other to the left, each ready to throw, a central division-flange preferably integral with both cams, and separate flanges secured to the cams by screw-bolts, of a square operating-rod extending through the said cams, with a square frame inclosing each cam and held thereto by said flanges, each provided with switching extensions or rods.

6. A switch-stand comprising a base-plate to be secured by bolts or spikes to a suitable foundation, supporting an upright hollow part, central of which is a square bar provided with bushings resting in suitable bearings at the upper and lower ends of the said hollow part, at the lower extremity of the bar and below the base-plate is attached two cams integral with each other, having flanges at their top and bottom sides, supported between which are inclosing frames secured to switch-rods, and at the upper part of the said bar is a shifting-lever the sides of whose looped end are pivoted thereto, and a pivoted link connecting the lever with a locking-piece adapted to slide upon the bar and whose lower end is provided with teeth and spaces, one of the latter engaging with a projection or tooth upon the inner surface of a chamber in the top of the said hollow part in which the locking-piece normally rests, as set forth.

7. A switch-stand consisting of a base-plate and an upright part, a central operating-rod in suitable bearings provided with means at its lower end for extending and retracting the switch-bars, and at its upper end with apparatus for operating said means adapted to be locked to said upright part and hold the switch-bars in two or more positions, with means for automatically shifting the said apparatus to partly unlock the same.

8. A switch-stand consisting of a base-plate and an upright part, a central operating-rod in suitable bearings provided with means at its lower end for extending and retracting the switch-bars, and at its upper end with apparatus for operating said means adapted to be

locked to said upright part and hold the switch-bars in two or more positions, with means for automatically shifting the said apparatus to partly unlock the same and to return it to its normal position.

9. A switch-stand consisting of a base-plate and an upright part, a central operating-rod in suitable bearings provided with means at its lower end for extending and retracting the switch-bars, and at its upper end with apparatus for operating said means adapted to be locked to said upright part and hold the switch-bars in two or more positions, comprising a chamber through which said operating-rod extends, having slots and pins in its floor, of a ring with an inward-extending tooth, and rods extending through said slots and adapted to hold the ring firmly to the upright part, and seats for the said pins, with a locking-piece adapted to lock with said tooth and to be moved upon said operating-rod, with means for automatically shifting the said apparatus to partly unlock the same and to return it to its normal position, as set forth.

10. A railway switch apparatus consisting of three tracks meeting at a switch, the outer rails of the main track continuing and forming one rail of each of the divergent tracks, the remaining rails constituting movable points all in line with one another at their tapered ends, each point of the main track united to a point of a divergent track by a pivoted bridle-bar provided with means for adjusting the said points relatively to each other, as set forth.

11. A railway switch apparatus consisting of three tracks meeting at a switch, the outer rails of the main track continuing and forming one rail of each of the divergent tracks, the remaining rails constituting movable points all in line with one another at their tapered ends, each point of the main track united to a point of a divergent track by a pivoted bridle-bar provided with means for adjusting the said points, each bridle-bar joined to a second bridle-bar connected by a rod to a switch-stand provided with means for moving each bridle-bar independent of the other.

12. The combination, in a railway switching apparatus, of a switch-stand and three railway-tracks, one constituting the central or main track and the others divergent tracks therefrom, the inner rails of the divergent tracks and both the rails of the main track at the switching-station are movable points, the points of the main track are joined by independent bridle-bars to the point of a track diverging toward the same, the ends of the bridle-bars secured to the main-track points being screw-threaded and having abutting nuts, while their opposite ends are secured to the point of the diverging track by a pivoted lug bolted thereto, each bridle-bar is joined to a second or lower bridle-bar adapted to slide under the rails and points, to which is

connected a rod terminating in a frame inclosing a cam at the said stand; the switch-stand comprises a base-plate supporting an upright hollow part, central of which is a square bar provided with bushings resting in suitable bearings, at the lower extremity of the bar below the base-plate is attached two cams integral with each other, having flanges adapted to support said frames around the cams, the cams being adjusted so that but one of them is adapted to throw its frame at the same time, and at the upper part of said bar is a shifting-lever, the sides of whose looped end are pivoted thereto, provided with a link pivoted to a locking-piece adapted to slide upon the bar and whose lower end is formed with teeth and spaces, one of the latter engaging with a projection or tooth upon the inner surface of a chamber in the top of said hollow part in which it normally rests.

13. The combination, in a railway switching apparatus, of a switch-stand, and three railway-tracks, one constituting the central or main track and the others divergent tracks therefrom, the inner rails of the divergent tracks and both the rails of the main track at the switching-station are movable points, the points of the main track are joined by independent bridle-bars to the point of a track diverging toward the same, each bridle-bar is joined to a second or lower bridle-bar adapted to slide under the rails and points, to which is connected a rod terminating in a frame inclosing a cam, at the said stand; the switch-stand comprises a base-plate supporting an upright hollow part, central of which is a square bar provided with bushings resting in suitable bearings, at the lower extremity of the bar below the said base-plate is attached two cams integral with one another, provided with flanges adapted to support the said frames around the cam; and at the upper part of the said bar is a shifting-lever the sides of whose looped end are pivoted thereto, having a link pivoted to a locking-piece adapted to slide upon the bar and whose lower end is provided with two teeth and three spaces, one of the latter engaging with a projection or tooth upon the inner surface of a chamber in the top of the said hollow part.

14. The combination, in a railway switching apparatus, of a switch-stand and three railway-tracks, one constituting the central or main track and the others divergent tracks therefrom, the inner rails of the divergent tracks and both the rails of the main track at the switching-station are movable points,

the points of the main track are joined by independent bridle-bars to the point of a track diverging toward the same, the ends of the bridle-bars secured to the main-track points being screw-threaded and having abutting nuts, while their opposite ends are secured to the point of the diverging track by a pivoted lug bolted thereto, each bridle-bar is joined to a second or lower bridle-bar adapted to slide under the rails and points, to which is connected a rod terminating in a frame inclosing a cam at the said stand; the switch-stand comprises a base-plate supporting an upright hollow part, central of which is a square bar provided with bushings resting in suitable bearings, at the lower extremity of the bar, below the base-plate is attached two cams integral with each other having flanges adapted to support the said frames around the cams, and at the upper part of said bar is a shifting-lever, the sides of whose looped end are pivoted thereto, provided with a link pivoted to a locking-piece adapted to slide upon the bar and whose lower end is formed with teeth and spaces, one of the latter engaging with a projection or tooth upon the inner surface of a chamber in the top of the said hollow part in which it normally rests.

15. A railway switch apparatus consisting of a switch-stand, a central operating-rod provided with means at its lower end for extending and retracting switch-bars, and at its upper end with apparatus for operating said means adapted to be locked to the stand, and hold the switch-bars and the rail-points in one or more positions, with automatically-elastic means between the locking apparatus and the rail-points, whereby the said points may be shifted and returned.

16. The combination in a main railway-track having one or more divergent tracks, each pair or pairs of movable points connected by a rod, of a block adapted to move upon the rod, of abutments secured on the rod at each end thereof between which and the ends of the block are heavy spiral springs, of a lower guiding bridle-bar extending through the block, with means attached to the block for operating the switch-points.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 13th day of November, 1902.

WILLIAM F. BOSSERT.

Witnesses:

WILLIAM GRAY,
CHAS. H. WING.