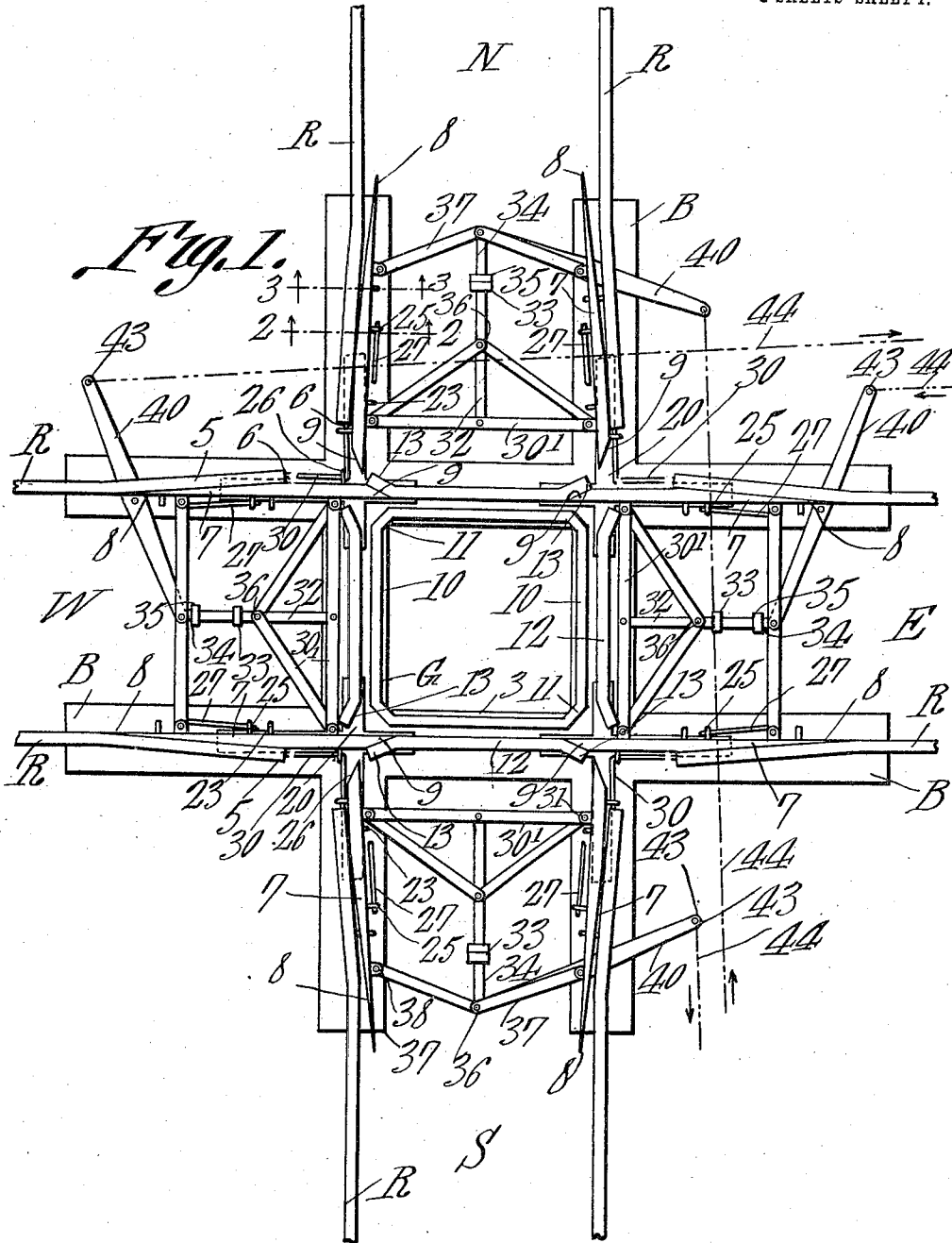


J. A. SNODGRASS.
RAILWAY CROSSING.
APPLICATION FILED MAR. 22, 1911.

1,001,699.

Patented Aug. 29, 1911.

2 SHEETS-SHEET 1.



Witnesses

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L. H. Wilson

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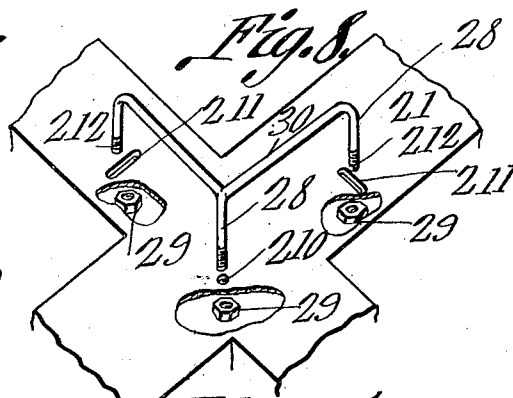
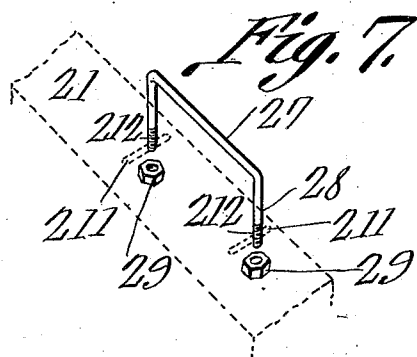
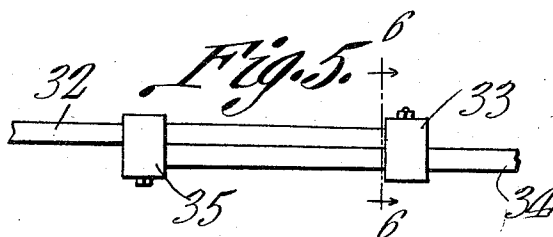
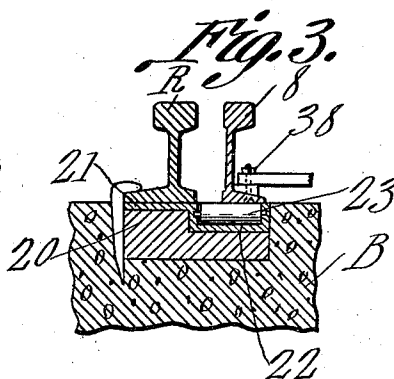
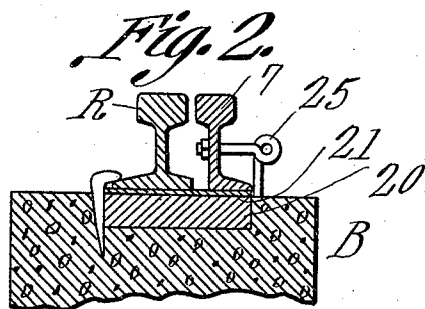
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN A. SNODGRASS, OF ENID, OKLAHOMA.

RAILWAY-CROSSING.

1,001,699.

Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed March 22, 1911. Serial No. 616,153.

To all whom it may concern:

Be it known that I, JOHN A. SNODGRASS, a citizen of the United States, residing at Enid, in the county of Garfield and State of Oklahoma, have invented a new and useful Railway-Crossing, of which the following is a specification.

This invention relates to railways, and more especially to crossings; and the object of the same is to produce a crossing which embodies the use of switch points that are beveled off on both their outer and inner ends, in conjunction with mechanism for moving them bodily in pairs so that the stub end of each shall slide in a truly longitudinal direction while the thin end will move diagonally into or out of position. This object is accomplished by the construction hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a plan view of this novel crossing, showing one track from east to west as set for the passage of the train and the other track from north to south broken. Figs. 2 and 3 are cross sections on the lines 2—2 and 3—3 of Fig. 1. Fig. 4 is a detail of one of the operating levers. Fig. 5 is a side elevation of the lost motion mechanism between each of said levers and the framework which moves the stub ends of the switch points. Fig. 6 is a section on the line 6—6 of Fig. 5. Figs. 7 and 8 are perspective views respectively of the single guide and the double guide hereinafter referred to.

I have herein shown and described a right-angular railroad crossing, although it will be understood that the two tracks could cross at different angles without departing from the spirit of my invention. The letters N, S, E and W designate respectively the north, south, east and west tracks which lead from the center C in their respective directions, and each track is as usual composed of two rails R mounted upon ties (not shown) and leading up to points near the crossing, through and across which they are preferably supported upon a base B made of cement or other heavy material to prevent settling as usual; and all these features form no part of the present invention. I have omitted an illustration and description of the operating mechanism for moving the parts of this crossing, although I have illustrated the rods which are intended to

lead to such mechanism if the latter be located at a remote point as usual, and the connections and the mechanism itself may be of any preferred construction. It will be understood that the tracks leading in four directions from this crossing are all alike so that a description of one will suffice for all of them, and it will be further understood that the movable parts of the north and south tracks are operated simultaneously and oppositely to each other (that is, either both away from the center or toward the center) at the same time that the parts of the east and west tracks are operated simultaneously in directions opposite to each other, but also in directions opposite to those in which the parts of the north and south tracks are moved. Furthermore it will be understood from the description as it progresses that the movable parts of one track must be drawn outward just a little before the movable parts of the other track are borne inward, the object being that the former shall clear the space so as to admit of the movements of the latter.

Coming now more particularly to the present invention and referring first to the left of Fig. 1 for reference numerals for the sake of greater clearness, each rail R of the west track W is deflected outward into a knee 5 and terminates at its extremity at the point 6 a sufficient distance away from the crossing proper to admit of the use of a bodily movable switch point 7 whose outer thin end 8 is of a bevel which complements that of the knee and whose inner stub end is beveled more abruptly on the outside as seen at 9. The center C is surrounded by a guard rail G having straight sides 10 and beveled corners 11 and secured upon the base B in any suitable manner, and parallel with said sides 10 are the crossing rails 12 each having a sharply bent knee 13 at its outer extremity and whose bevel corresponds with that of the stub end 9 of the switch point. Furthermore, the knee 13 at each end of each crossing rail 12 stands with its beveled face at a distance from the beveled face of the adjacent and coöperating knee 5 of the rail R next to it, which just equals the length of the switch point when the latter stands between these members and in alinement with them so as to form a continuous track as shown at the left of Fig. 1. It follows, then, that when eight switch points are provided and four of

them are set in alinement with the east and west rails as shown in this view, the other four must be retracted or drawn outward so as to permit the first four to stand in the position referred to, and the mechanisms for retracting these rails and for moving them again into place will now be described.

Thick metal plates 20 are set into the concrete of the base B beneath all rails, and by preference steel plates 21 underlie such rails as have any movement, these latter plates having pockets 22 in which are journaled rollers 23 (see Fig. 3) where the movement is considerable. Indeed, there might be a roller under each end of each switch point if desired. Said point carries eyes 25 and 26 which are too low to be struck by the flanges of the wheels, the eye 25 nearer the thin end of each switch point being on its inside and slidably engaging a single guide 27 (see Fig. 7) whose extremities or legs 28 are turned downward and passed through one of the plates on the base and held in position by means of nuts 29 or otherwise. The eye 26 nearer the stub end of the switch point is, however, on its outer side and slides upon one arm of a double guide rod (see Fig. 8) which may well be mounted on the base in the same manner as the single guide rod. As seen in Fig. 1, the single guides are set oblique to the length of the rails R, but the double guides are set in the angles of the base members B beyond the extremities 6 of the knees 5. It follows that when the two switch points are pressed inward as at the west of Fig. 1 their stub ends 9 engage with the knees 13 of two of the crossing rails 12 and their thin ends 8 engage with the knees 5 of the two west rails R so that the east and west tracks become continuous. On the other hand, the two switch points at both north and south of the crossing must at this time be retracted to permit the east and west switch rails to be moved inward, and (referring to numerals toward the north in this view) it will be seen that each point must have been moved outward so that its eye 26 has slid along upon the double guide 30 to a position practically in contact with the extremity 6 of the rail R, which it could well do in order to permit the eye 26 of the west rail to move inward on the other arm of the same guide; and meanwhile the eye 25 of the north switch point 7 has moved along upon the single guide rod 27 which, being inclined or oblique, has caused the thin end of this point to be deflected inward away from the rail R as shown. It is obvious that longitudinal movement will be facilitated by use of the rollers 23, and even if two rollers are employed they touch the switch point at but two points and will not greatly retard the slight lateral movements which said point

has. If all parts are kept clean and the crossing is used in localities where the weather conditions do not interfere, it may be possible to dispense with these rollers entirely. As to the complete crossing, it will be clear that when the east and west tracks are both made continuous with the center C in the manner above described, a train may pass over the crossing in that direction with such ease that the passengers would hardly realize that it had been done; but on the other hand it would be absolutely impossible for a train on the north and south tracks to pass across at all, and if the engineer were so foolhardy as to attempt it he would meet with derailment. However, when the operating mechanism is moved to retract the east and west switch points and to press forward those on the north and south tracks, the same conditions prevail in this direction as formerly did in the opposite direction.

I have said that the single guides 27 stand oblique to the rails R and that the arms of the double guides 30 stand parallel with said rails; but the degree of angularity of the former and in fact the accurate parallelism of the latter may be rendered slightly adjustable if it is desired to cause the beveled extremities of the switch points to come into close contact with the beveled faces of the knees.

Referring now to Figs. 7 and 8, the numeral 210 designates a hole through the plate 21 through which the central leg 28 of the double guides may be passed, but the numerals 211 designate slots through said plates through which may be passed its outer legs as well as the legs of the single guide 27, all legs having shoulders 212 cooperating with the nuts 29 to permit adjustment. This however is only typical of one means I may employ for permitting the adjustment of the guides, and the hole 210 does not contemplate any adjustment at the angle of the double guide. It will be clear that other means might be employed for accomplishing this same end, or that in fact the guides might be fixed upon the base without any adjustment if the bevels were accurately made. It will hardly need illustration to make it clear to the reader that the guides might project from the switch points and the eyes rise from the base, as that would be merely a reversal of the construction described.

In the use of switch points whose inner portions move on lines substantially parallel with the rails R and whose thin ends move both longitudinally and laterally inward, it becomes necessary to provide mechanical means for shifting these points in such manner as to accommodate these movements. Accordingly, the numeral 30' represents a skeleton framework connected as

at 31 with the sides of any two points 7 near their stub ends 9 and extending between them so as to hold said ends a sufficient distance apart, and 32 is a rod leading outward from this framework between the rails and having a sleeve 33 secured to its outer extremity as seen in Fig. 5. 34 is another rod lapping the outer end of the first rod and itself having a sleeve 35 fixed to it and surrounding the rod 32 at a point inside its sleeve 33. The construction is such that when the outer rod is pushed inward these two rods slide upon each other as the sleeves will permit and said sleeves are separated as seen at the right and left of Fig. 1, but when the outer rod is drawn outward its sleeve 35 is drawn along until it contacts with the sleeve 33 of the inner rod 32 and thereafter the latter is drawn outward forcibly and the two sleeves stand in contact as seen at the top and bottom of Fig. 1. The outer end of the outer rod is pivoted as at 36 to the center of a toggle lever whose links 37 are in turn pivoted at their outer extremities as at 38 to the switch points 7 near their thin ends 8, the length of said links being such that when they stand in true alinement as seen at the right and left of Fig. 1 the switch points have been spread apart so that they in turn stand in true alinement with the rails R.

The numeral 40 designates an operating lever pivoted to the base at a point 41 intermediate its extremities and there extending beneath the rails, its inner end 42 being slotted and mounted on the pivot 36 and its outer end 43 having an eye which is connected with one of the rods 44 that lead to the operating mechanism (not shown).

The operation of this device, when the various pairs of switch points are connected up in the manner just above described, will be understood by reference to the light arrows adjacent the rods 44 of the north and south levers 40 and the heavy arrows adjacent the rods 44 of the east and west levers. With the parts standing as seen in Fig. 1 the east and west track is complete and the north and south track is broken. If now it is desired to change the position of the crossing, the two rods 44 of the east and west tracks must be simultaneously moved in directions opposite to each other as indicated by the heavy arrows, and this draws the east and west switch points out of the position shown so that they are retracted as now illustrated with respect to the north and south points. Thereafter the rods of the latter must be simultaneously moved in a direction opposite to each other and as indicated by the light arrows, whereby these points are pressed forward and their inner ends move across the spaces vacated by the inner ends of the east and west points, so that finally these north and

south points come into a closed position as now indicated with respect to the east and west points; and the north and south track is complete while the east and west is broken. During the inward movement of these points, each at its stub end moves in a direction substantially parallel with the length of the main rail until its bevel lies against that of the knee 13 of the crossing rail 12, and meanwhile its thin outer end is moved in an oblique direction until its outer beveled side lies against the bevel of the knee 5 of the main rail R. This compound movement is produced by the straight forward movement of the framework 30 and the simultaneous straightening out of the links 37 of the toggle, both of which are produced by the swinging of the lever 40 and the lost motion permitted by the lapping ends of the rods 32 and 34. That is to say, when the lever 40 first begins its movement the parts stand as seen at the bottom of Fig. 1 with the two sleeves 33 and 35 in contact. As the pivot 36 moves inward, the first impulse is for the outer rod 34 to slide beneath the inner rod 32 and the sleeves to pass out of contact; but as the toggle at this time stands with its links oblique to each other, an inward movement of the pivotal point 36 causes the said toggle to advance bodily toward the central point of the crossing, so that—although the rods slide over each other—the inner rod and the framework 30 are carried along toward the center because the toggle moves the outer ends of the switch points toward said center and the points themselves carry the framework with them. On a reverse movement, or in other words, when the lever 40 is swung in the opposite direction, the first impulse due to the outward movement of its inner extremity is to draw the outer rod 34 outward until its sleeve 35 contacts with the sleeve 33, and then the toggle is broken at its center and its links no longer stand in alinement as seen at the right of Fig. 1. The contact of the two sleeves causes the continued outward movement of the point 36 to draw on the combined rods, with the result that the framework 30 is then drawn forcibly outward and with it the points move in unison at their inner ends while their outer ends also move longitudinally outward and radially inward toward each other as the gradual folding up of the links of the toggle will permit.

All parts of this crossing are of the desired materials, proportions, and specific details of construction; and various changes therein may be made without departing from the principle of my invention.

What is claimed is:

1. In a railway crossing, the combination with two sections of rail having their adjacent ends out of contact and both deflected

laterally to one side to form knees; of a switch point beveled at both extremities to fit the bevel of said knees, and means for moving it bodily in one direction to throw
5 its extremities into contact with the beveled faces of the knees and in the other direction to throw its extremities out of such contact.

2. In a railway crossing, the combination with two sections of rail having their adjacent ends out of contact and both deflected laterally to one side to form knees; of a switch point beveled at both extremities to fit the bevel of said knees, and means for moving its stub end longitudinally into or
10 out of contact with the bevel of the knee of one rail end and simultaneously moving its thin end in a direction other than longitudinally into or out of contact with the bevel of the knee of the other rail end.

3. In a railway crossing, the combination with two sections of rail having their adjacent ends out of contact and both deflected laterally to one side to form knees; of a switch point beveled at both extremities to fit the bevel of said knees, and means for moving its stub end longitudinally into or
25 out of contact with the bevel of the knee of one rail end and for moving its other end obliquely into or out of contact with the bevel of the knee of the other rail.

4. In a railway crossing, the combination with two sections of rail having their adjacent ends out of contact and both deflected laterally to one side to form knees; of a switch point beveled at both extremities to fit the bevel of said knees, a support for all
35 said rail members, a guide mounted on the support and standing parallel with said rail ends, another guide mounted on the support and standing oblique to the first guide, members on said point slidably engaging said guides, and means for moving the point into or out of position in alinement with said rail ends.

5. In a railway crossing, the combination with two rails standing at an angle to each other and each having a laterally deflected knee at its inner end, crossing rail sections in alinement with said rails and each also
50 having a laterally deflected knee, and a base for supporting said rails and including a plate; of a switch point beveled at its extremities so as to be complementary to each rail end and its respective crossing rail, eyes projecting laterally from said point, a double guide rod carried by said plate at a point where the innermost eyes on the two switch points will engage its arm, single guides carried by said plate remote from the double guide and at points where the outermost eyes on the switch points will engage their arms, and means for moving said switch points.

6. In a railway crossing, the combination
65 with two rails standing at an angle to each

other and each having a laterally deflected knee at its inner end, crossing rail sections in alinement with said rails and each also having a laterally deflected knee, and a base for supporting said rails and including a
70 plate having a hole through it outside the space between said four rail ends and slots through it elsewhere; of a switch point beveled at its extremities so as to be complementary to each rail end and its respective crossing rail, eyes projecting laterally from said points, a double guide having right angular arms slidably engaged by the innermost eyes on said switch points and three depending legs whereof that at its angle engages said
75 hole and the others are adjustably mounted in two adjacent slots in the plate, and two single guides whereof each has an arm engaged by the outermost eye of one of said switch points and two depending legs adjustably mounted in two other slots in said plate, and means for moving said points.

7. In a railway crossing, the combination with the main rails of each track having outwardly deflected knees at their inner ends, and crossing rails complementing said main rails and themselves having outwardly bent knees at their extremities spaced from those of the main rails; of a switch point for each rail beveled at its extremities so
90 as to complement the beveled faces of the knees of the rail and its corresponding crossing section, means for permitting one extremity of the switch point to move longitudinally and the other extremity to move obliquely into or out of position, a framework connecting the inner ends of a pair of companion points, a rod projecting outward from said framework and having a sleeve at its outer end, a toggle lever connecting the outer ends of said points, a rod projecting inwardly from its pivot and lapping said other rod and passing through its sleeve and itself having a sleeve embracing the first mentioned rod, and means for moving the pivotal point of said toggle lever outward or inward.

8. In a railway crossing, the combination with the main rails of each track having outwardly deflected knees at their inner ends, and crossing rails complementing said main rails and themselves having outwardly bent knees at their extremities spaced from those of the main rails; of a switch point for each rail beveled at its extremities so as to complement the beveled faces of the knees of the rail and its corresponding crossing section, means for permitting one extremity of the switch point to move longitudinally and the other extremity to move obliquely into
110 or out of position, a framework connecting the inner ends of a pair of companion points, a rod projecting outward from said framework, a toggle lever connecting the outer ends of said points, a rod projecting in-
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120
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130

wardly from its pivot and lapping said other rod, means for permitting said rods to have a certain lost motion upon each other, and means for moving the pivotal point of the toggle lever outward or inward.

9. In a railway crossing, the combination with the main rails of each track having outwardly deflected knees at their inner ends, and crossing rails complementing said main rails and themselves having outwardly bent knees at their extremities spaced from those of the main rails; of a switch point for each rail beveled at its extremities so as to complement the beveled faces of the knees of the rail and its corresponding crossing section, means for permitting one extremity of the switch point to move longitudinally and the other extremity to move obliquely into or out of position, a framework connecting the inner ends of a pair of companion points, a rod projecting outward from said framework, a toggle lever connecting the outer ends of said points, a rod projecting inwardly from its pivot and lapping said other rod, means for permitting said rods to have a certain lost motion upon each other, an operating lever pivoted at a point between its extremities and having a slot at its inner end loosely engaging the pivotal point of said toggle, and connections between the outer end of said lever and the operating mechanism of the crossing.

10. In a railway crossing, the combination with the main rails of each track having outwardly deflected knees at their inner ends, and crossing rails complementing said main rails and themselves having outwardly bent knees at their extremities spaced from those of the main rails; of a switch point for each rail beveled at its extremities so as to complement the beveled faces of the knees of the rail and its corresponding crossing section, eyes on the switch point near its inner and outer extremities, a guide parallel with the line of the rail and on which the innermost

eye is mounted, another guide oblique to the line of the rail and on which the outermost eye is mounted, a framework connecting the inner ends of a pair of companion points, a rod projecting outward from said framework, a toggle lever connecting the outer ends of said points, a rod projecting inwardly from its pivot and connected with said other rod, and means for moving the pivotal point of said toggle lever outward or inward.

11. In a railway crossing, the combination with the main rails of each track having outwardly deflected knees at their inner ends, and crossing rails complementing said main rails and themselves having outwardly bent knees at their extremities spaced from those of the main rails; of a switch point for each rail beveled at its extremities so as to complement the beveled faces of the knees of the rail and its corresponding crossing section, eyes on the switch point near its inner and outer extremities, a guide parallel with the line of the rail and on which the innermost eye is mounted, another guide oblique to the line of the rail and on which the outermost eye is mounted, a framework connecting the inner ends of a pair of companion points, a rod projecting outward from said framework and having a sleeve at its outer end, a toggle lever connecting the outer ends of said points, a rod projecting inwardly from its pivot and lapping said other rod and having a sleeve embracing it for permitting said rods to have a certain lost motion upon each other, and means for moving the pivotal point of the toggle lever outward or inward.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN A. SNODGRASS.

Witnesses:

W. H. STEWART,
J. W. BAKER.