

P. E. BEACH.
RAILWAY SWITCH.

APPLICATION FILED SEPT. 20, 1911.

Patented Feb. 25, 1913.

2 SHEETS-SHEET 1.

1,054,492.

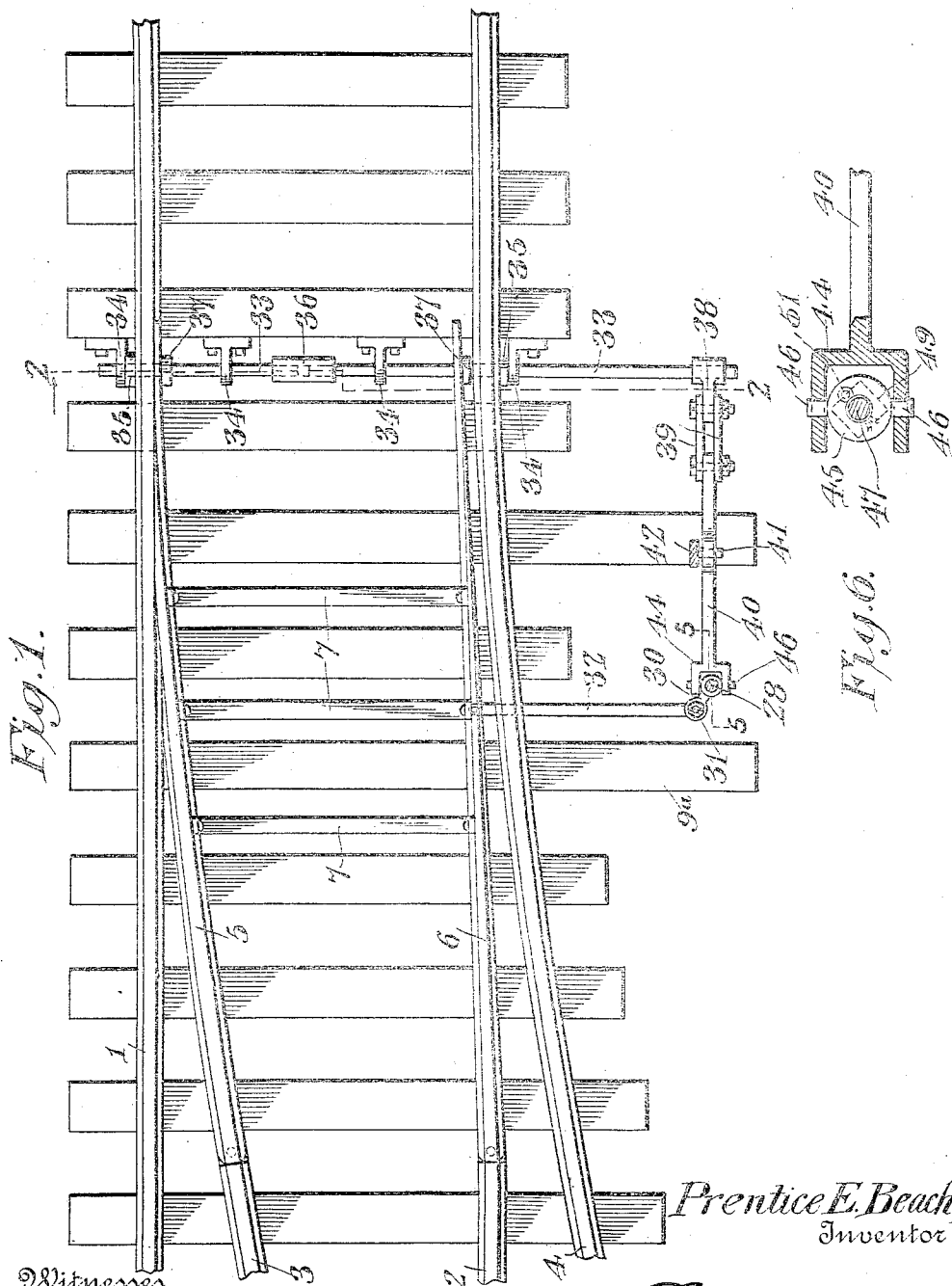


Fig. 1.

Fig. 2.

Witnesses
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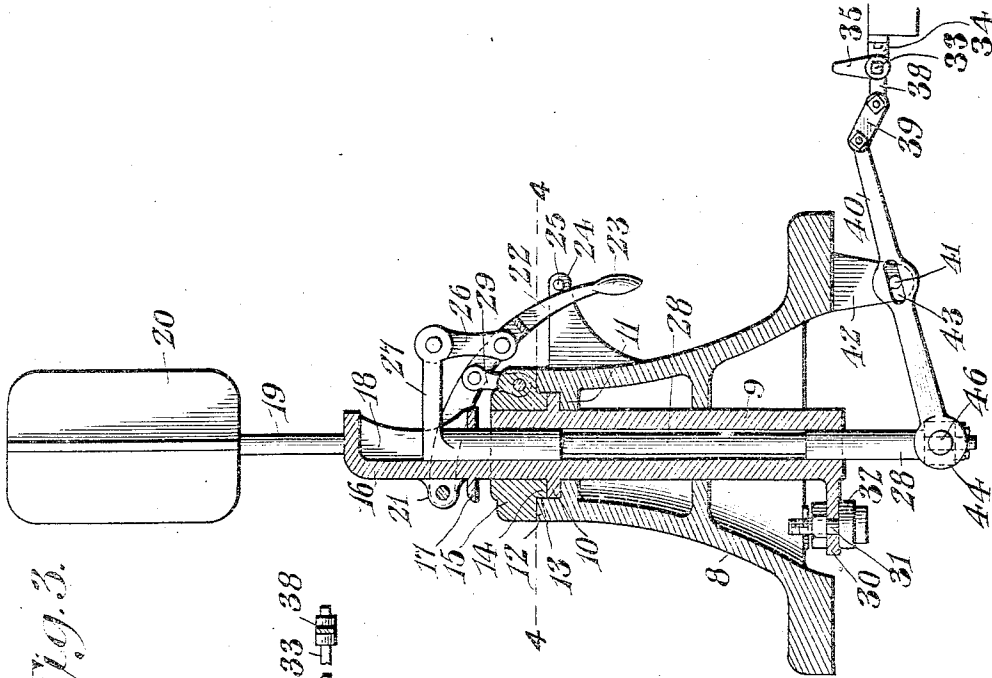


Fig. 3.

Fig. 2.

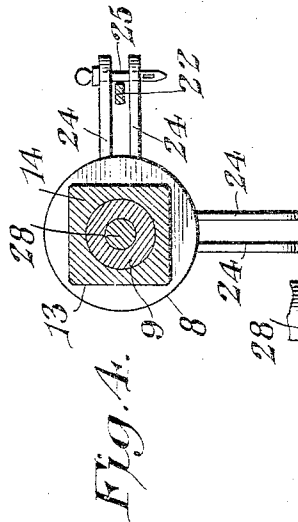
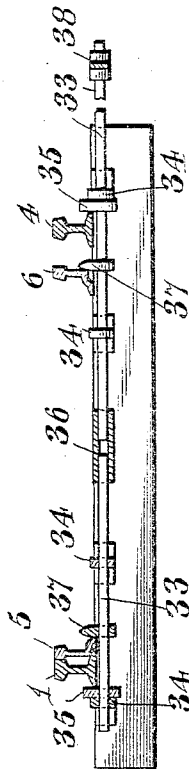


Fig. 4.

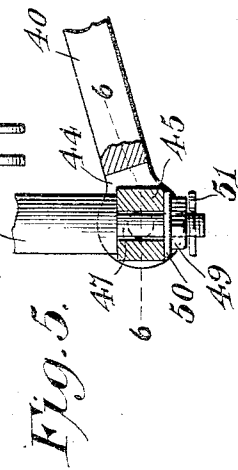


Fig. 5.

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UNITED STATES PATENT OFFICE.

PRENTICE EDGAR BEACH, OF HARWOOD MINES, PENNSYLVANIA.

RAILWAY-SWITCH.

1,054,492.

Specification of Letters Patent.

Patented Feb. 25, 1913.

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To all whom it may concern:

Be it known that I, PRENTICE E. BEACH, a citizen of the United States, residing at Harwood Mines, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Railway-Switch, of which the following is a specification.

This invention has reference to improvements in railway switches, and its object is to provide a means whereby the switch points are locked at either limit of their movement against accidental displacement with relation to the respective rails, so that there is no possibility of the wheels of a passing train engaging the switch points in any manner other than the designed or proper manner.

In accordance with the present invention any suitable or approved switch stand may be employed, or a special switch stand may be utilized, and in conjunction with such switch stand there is provided a switch point lock so arranged as to engage on either side of each switch point close to the free end thereof in a manner to hold one switch point closely against the rail into engagement with which it is moved and at the same time hold the other switch point from movement toward the rail to which it is adjacent, and from which it is spaced. The arrangement is such that by the act of throwing the switch, the locking means which is normally active to the switch points is moved out of the path of the points before the latter can be shifted from one position to the other, and the act of resetting the switch stand mechanism to hold the switch points in the new position serves to reset the locking means for holding one switch point in engagement with a respective rail in practically immovable relation thereto and the other switch point against movement toward the rail to which it is adjacent.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that while the drawings illustrate a practical embodiment of the invention, the latter is susceptible of other practical embodiments, and, therefore, the invention is not limited to any exact conformity with the showing of the drawings but may be changed and modified in various

ways so long as the salient features of the invention are retained.

In the drawings:—Figure 1 is a plan view of a portion of a railway track including a switch or turn-out and showing the invention applied. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a central vertical section of a switch stand constructed in accordance with the present invention. Fig. 4 is a section on the line 4—4 of Fig. 3 with distant parts omitted. Fig. 5 is a section on the line 5—5 of Fig. 1 but drawn to a larger scale. Fig. 6 is a section on the line 6—6 of Fig. 5.

Referring to the drawings, there are shown track rails 1, 2, which may be considered as main track rails, and other rails 3, 4, constituting the rails of a turn-out. Connected to the rail 3 is a switch point 5 and connected to the rail 2 is a switch point 6, and the two switch points 5 and 6 are connected together by junction bars 7, as is customary, the two switch points being thereby constrained to move together in the usual manner to bring the free end of one switch point into engagement with a main rail and at the same time carry the free end of the other switch point a suitable distance away from the other main rail.

There is provided a switch stand comprising a basic member 8 of suitable construction designed to rest upon or be secured to extended ties 9^a, or to be mounted upon any suitable support adjacent the switch points. Mounted in the basic member is a sleeve or hollow column 9 substantially vertical when the switch stand is in installed position, and this sleeve 9 is supported in the switch stand base by a flange 10 situated on an inwardly directed annular shoulder 11 formed on the basic member 8 near the upper end thereof, the said basic member being hollow for lightness of construction. Above the shoulder 11 the basic member has an upstanding portion 12 which defines a recess 13 preferably of square contour designed to receive a square extension 14 of a block 15 normally resting on the top of the extension 12. The sleeve 9 is cylindrical in form where extending through the basic member 8 and where extending through the block 15, the said sleeve having an extension or head 16 above the block 15 and being there formed with a flange 17 above which the extension 16 is hollowed out, as indicated at 18, for a purpose which will presently appear. Sur-

mounting the head 16 is a stem 19 carrying at its outer end a target 20, such as is customarily employed in connection with switch stands.

5 The head 16 on one side, that is the side remote from the hollowed out portion 18, is provided with ears 21 to which is pivoted one end of a lever 22, the other end of which lever may be formed into a handle 23 for
10 convenience of manipulation, and is designed to enter between adjacent ears 24 formed on the base 8, the said ears 24 being arranged for the reception of a lock pin 25 constructed for the reception of a suitable
15 lock, as is customary in switch stands, the pin 25 being in position only when the switch stand is not being manipulated. The lever 22 is connected by a link 26 to an arm 27 outstanding from a rod or shaft 28 extending axially through the sleeve 9 and
20 capable of turning about its longitudinal axis in said sleeve as well as moving in the direction of its longitudinal axis, the hollowed out portion or cavity 18 of the head 16 permitting such longitudinal movement
25 of the shaft 28. The lever 22 is also connected by a link 29 with the block 15, so that movement of the lever 22 about its axis in the ears 21 will be participated in
30 by the block 15, the flange or shoulder 17 limiting the movement of the block 15 and lever 22 in one direction.

The lower end of the sleeve 9 is formed with an arm 30 outstanding therefrom in a
35 substantially radial direction, and this arm is connected by a bolt 31 or in any other suitable manner with a link 32, which in turn is connected to the switch point 6 and by the bars 7 to the other switch point 5,
40 the arrangement being such that turning of the shaft 28 about its longitudinal axis will cause a movement of the switch points in one direction or the other, as the case may be.

45 Mounted in transverse relation to the track close to the free ends of the switch points 5 and 6 is a rock shaft 33 journaled in brackets 34 which may be made fast to one of the ties supporting the track rails
50 1 and 2, or may be otherwise mounted, as circumstances may require. The shaft 33 has fast thereto collars 35 close to the outer edges of the respective rails 1 and 2, these collars being either applied to the shaft and
55 secured thereto in any suitable manner, or may be welded to the shaft so as to be in fixed relation thereto. In the particular structure shown the collars 35 are each lodged between a respective main track rail
60 and an outer bearing bracket 34. The shaft 33 is made in two parts connected at an intermediate point by a coupling sleeve 36 with relation to which each part of the shaft may move for a short distance to permit
65 slight variations in the gage of the track

due to passing trains without putting the shaft under undue strain. By making the shaft square in cross section and the bore of the sleeve 36 of like cross section, the two members of the shaft will turn in unison
70 due to the coupling action of the sleeve 36.

Mounted on the shaft 33 are two lugs or fingers 37 in fixed relation to the shaft and so located with respect to an adjacent rail
75 1 or 2, as the case may be, that a lug 37 will either enter between the free end of a respective switch point and the adjacent rail, or the switch point will lodge between the
80 lug 37 and the respective track rail, in which latter case the switch point is held snugly against the respective track rail, so that it may not then move independently of the rail for a distance sufficient to permit a wheel flange to enter between the
85 switch point and the rail against which it is lodged.

The shaft 33 is extended to one side of the main track and there receives an arm 38 made fast to the shaft 33 to turn therewith, and this arm is connected by links 39 to one
90 end of a lever 40, the latter being fulcrumed on a pin 41 outstanding from a lug 42 formed on the basic member 8 and in the particular structure shown in depending relation to said basic member. The lever 40 is
95 provided with an elongated slot 43 where traversed by the pin 41, so that the lever may have an extent of movement in the direction of its length. The end of the lever
100 40 remote from the links 39 is forked or bifurcated, as indicated at 44, to straddle a block 45, and is connected to the block by trunnions 46. The block 45 is traversed by a short stem 47 formed on the lower end of
105 the shaft 28 and is held thereto in any suitable manner, as by a nut 49 and washer 50, while a cotter pin 51 may be employed to prevent accidental unscrewing of the nut 49 from the stem 47, which latter is suitably threaded for the reception of the nut.
110

Let it be assumed that the parts are in the position shown in Fig. 1 with the manipulating lever 22 locked as indicated in Fig. 3. Under these conditions the lugs or fingers 37
115 are substantially upright, one lug or finger confining the switch point 5 close to its free extremity to the rail 1, while the other lug or finger 37 is interposed between the rail 4 and the free extremity of the switch point 6. The lugs or fingers 37 are suitably proportioned
120 to avoid any interference with the wheel flanges of a train, while at the same time performing the functions for which these lugs or fingers are designed. In the particular structure shown the siding is connected
125 to the main track, so that a train traveling from right to left as viewed in Fig. 1 will pass on to the siding, assuming the tracks 3 and 4 to be siding tracks, although they may represent any other tracks.
130

Suppose now that it is desirable to establish the continuity of the main track made up of the rails 1 and 2, the operator unlocks the lever 22 by withdrawing the pin 25 from the ears 24 and then lifts the lever 22, thus lifting the shaft 28 and the block 15 simultaneously. The operation just described also results in a rocking of the lever 40 in a direction to in turn rock the shaft 33 to move the lugs or fingers 37 out of the path of the respective switch points 5 and 6. By the time the shaft 28 is released so that it may be turned about its longitudinal axis, the lugs or fingers 37 have been moved out of the path of the switch points and now by turning the shaft 28 about its longitudinal axis by means of the lever 22 the arm 30 and link 32 will cause a movement of the switch points from the position shown in Fig. 1 to the opposite position, that is, the switch point 6 is brought into contact with the rail 4 and the switch point 5 is moved out of contact with the rail 1. To lock the switch points in the new position, the lever 22 is depressed until it is lodged between a pair of ears 24 when the corresponding pin 25 may be inserted and the usual padlock applied. On depressing the lever 22 the block 15 is lowered into the recess or cavity 13 designed to receive it, and this lowering movement of the block 15 and shaft 28, which latter participates in the lowering movement of the lever 22, results in the rocking of the lever 40 in a direction opposite to that in which it was first rocked and the links 39 and arm 38 cause a partial rotation of the shaft 33 in the direction to move the lugs or fingers 37 into the normal upright position, when the lug 37 adjacent the rail 1 enters the space between the free end of the switch point 5 and the said rail 1, while the lug 37 adjacent the point 6 engages the latter on the face remote from the rail 4 so as to lock the switch point into such intimate relation with the rail 4 that it cannot move away therefrom to any material extent and consequently there is no danger of a car wheel engaging the switch point in any manner except the proper manner, nor can the switch point spring away from the rail, since it is positively locked to the rail between the corresponding collar 35 and the lug or finger 37.

It is to be observed that all movements of the parts are positive and can only take place at the will of the operator. Moreover, the switch stand cannot be set to the locked position in either direction unless a corresponding one of the switch points is in engagement with the respective track rail. By locating the lugs or fingers 37 close to the free or pointed ends of the switch points, any material, such as ice, or snow, or stones, or cinders, or other obstructions, cannot find lodgment between a switch point and an adjacent rail and still permit the locking of

the rotatable member of the switch stand in either of its positions of adjustment, for even such yielding or spring as may occur in the device is not sufficient to admit of the movement of the switch stand to either of its limits of travel when a switch point is held away from a respective rail by some obstruction when such obstruction is of a character to produce a liability of accident because the switch point does not lie snugly against the rail toward which it is moved.

Should an obstruction interfere with the proper positioning of a switch point, the lever 22 cannot be turned to the necessary extent to permit its being locked in one position or the other of its adjustment until the obstruction is cleared away, and failure to properly set the switch is at once apparent from the position of the target 20. By this means provision is made for the prevention of accidents due to improperly set switches where the visible indications may appear to be correct while the points themselves are still in a position dangerous to the passage of trains. This desirable condition is due to the fact that the movement of the devices for holding the switch points is positive in both directions, wherefore the switch cannot be set fully to either position without the operation of the holding device and any failure of the switch points to move to their fully operative positions causes a stopping of the moving parts of the switch stand short of the full operative positions and the moving parts of the switch stand cannot be locked nor can the target be turned to the proper indicating position.

What is claimed is:—

1. In a railway switch operating mechanism, switch points, a switch stand provided with a rotatable member and connections therefrom to the switch points for moving the latter to different positions, a rock shaft having lugs or fingers in position to each engage either side of a respective switch point nearer the free end thereof than the connections between the switch points and the rotatable member, a longitudinally movable and rotatable shaft concentric with the rotatable member of the switch stand, connections between said shaft and the rock shaft carrying the lugs or fingers, and an operating lever connected to the point operating rotatable member and also to the rotatable and longitudinally movable shaft connected to the switch stand.

2. In a railway switch operating mechanism, switch points, a switch stand provided with a rotatable member, connections between said rotatable member and the switch points for moving the latter to their limits of travel, a shaft carried by the rotatable member and movable longitudinally thereof, a lock member carried by the rotatable member and also movable longitudinally

thereof, a lever carried by the rotatable member, connections between the lever and the shaft concentric with the rotatable member and also from the lever to the lock member, a rock shaft in traversing relation to the switch points adjacent the free extremities thereof, said rock shaft carrying lugs or fingers movable into and out of engagement with either side of the respective switch points, and connections between the rock shaft and the shaft carried by the rotatable member of the switch stand for causing the actuation of the rock shaft on the longitudinal movement of the shaft carried by the switch stand.

3. In a railway switch operating mechanism, switch points, means for operating the switch points, and means for holding either switch point in engagement with a respective rail and the other switch point out of engagement with a respective rail comprising a two-part rock shaft, a coupling member between the adjacent ends of the rock shaft with relation to which the members of the rock shaft are movable in the direction of their length, lugs or fingers on the rock shaft in position to each engage either side of a respective switch point, and means on the rock shaft in position to engage the track rails at the outer edges of the latter.

4. In a railway switch operating mechanism, switch points, a switch stand having two concentric rotatable members with the inner member movable longitudinally in and with relation to the outer member, a locking member on the switch stand carried

by the outer rotatable member, manipulating means carried by the outer rotatable member and connected to both the locking means and the inner rotatable member, connections between the outer rotatable member and the switch points, and engaging means for the switch points and connections between the inner rotatable member and said engaging means for operating said engaging means in timed relation to the operation of the switch points.

5. In a railway switch operating mechanism, switch points, locking means for the switch points adjacent the free ends thereof, a switch stand, upright concentric rotatable means carried by the switch stand with one of the concentric means movable axially of and through the other, positive connections between the lower end of the longitudinally movable concentric means and the locking means for the switch points, connections between the lower end of the other of the concentric means and the switch points for shifting the latter, and manipulating means for the concentric means connected to the latter for actuating the longitudinally movable means and for rotating the concentric means.

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

PRENTICE EDGAR BEACH.

Witnesses:

HARRY M. BEACH,
FRANK P. BOYLE.