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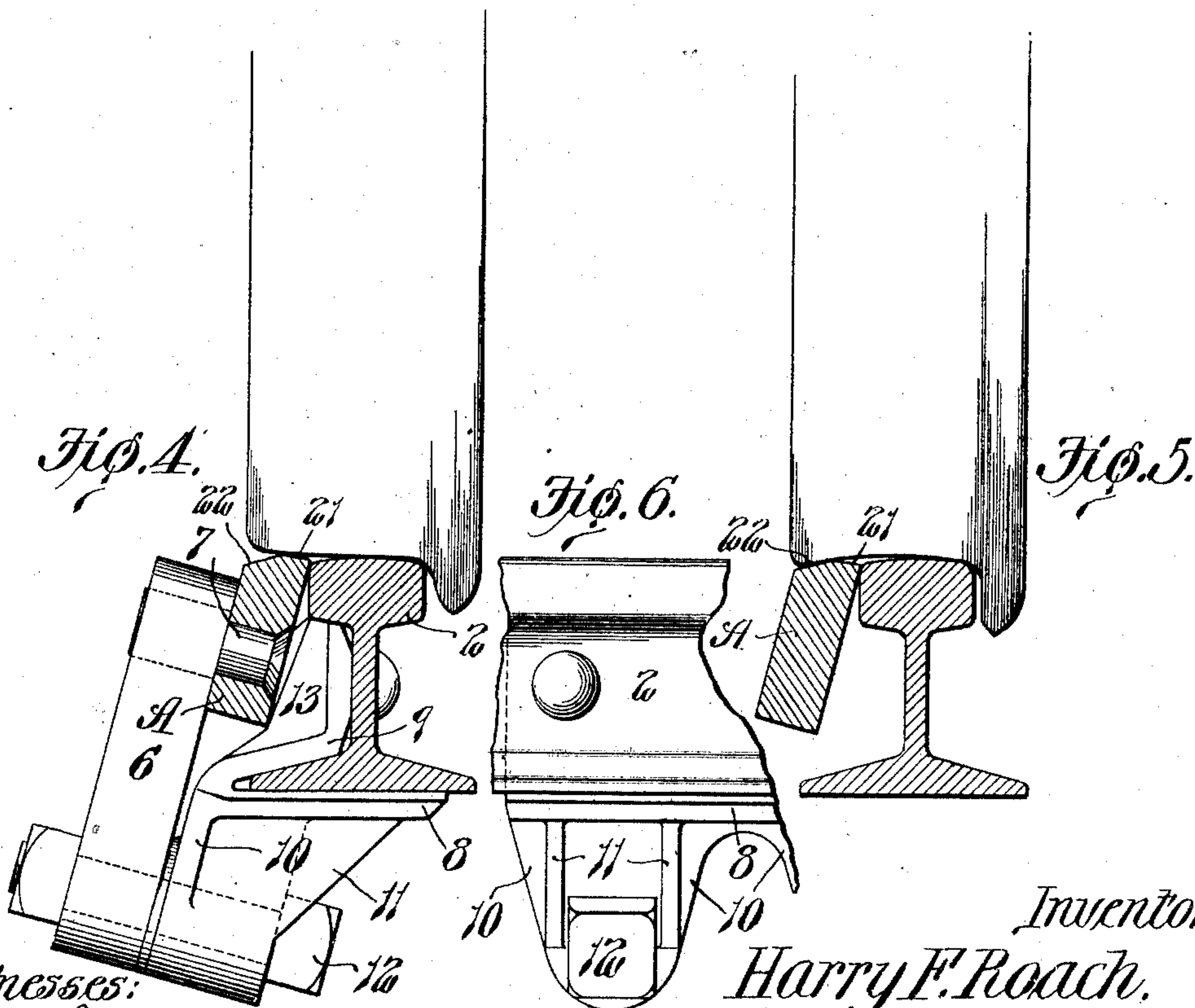
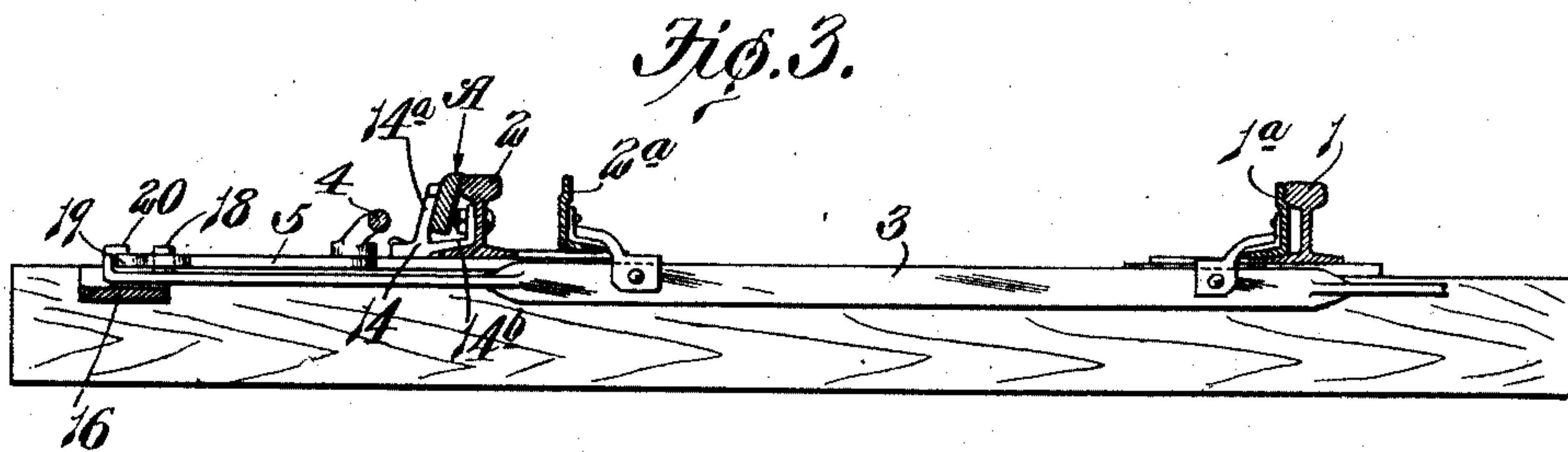
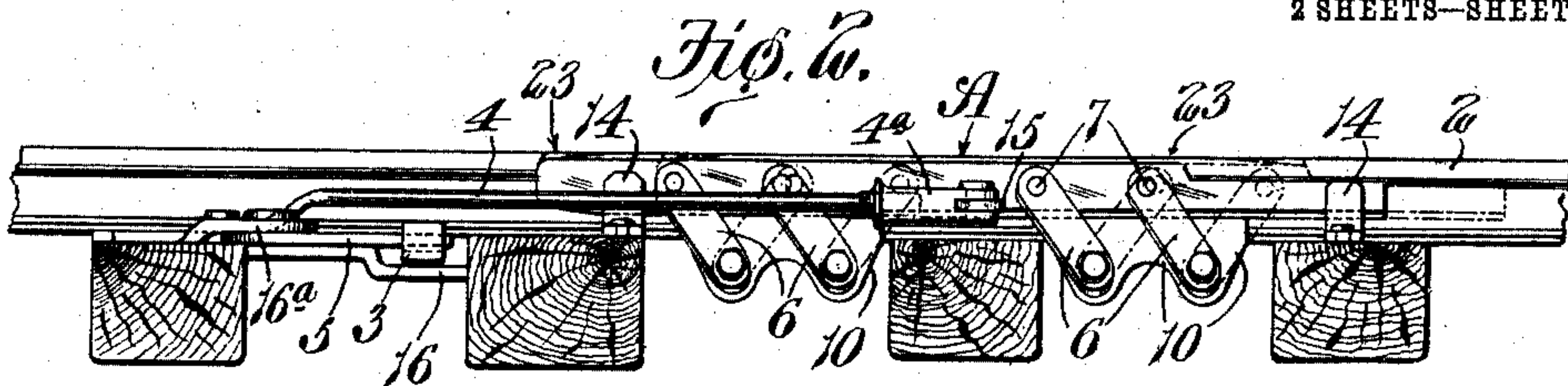
SWITCH.

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929,788.

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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## SWITCH.

No. 929,788.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed March 5, 1909. Serial No. 481,369.

*To all whom it may concern:*

Be it known that I, HARRY F. ROACH, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Switches, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to railway track structures, and particularly to that type which comprises mechanism for moving or shifting the switch-points laterally, and independent means that is adapted to be operated by a passing train for completing the movement of the switch-points in case they are not positioned properly and also for holding said switch-points locked in operative position while the train is passing through the switch.

One object of my invention is to provide a switch of the character above described in which the means that corrects misplacement of the switch-points and also holds them locked against lateral movements consists of a wheel-operated member which is so designed that it will cooperate with a perfect wheel or with a "double flanged" or imperfect wheel; namely, a wheel whose tread has become worn to such a degree that it is substantially concaved in cross section. And still another object of my invention is to provide a railway track structure of the character described in which the wheel-operated member is supported in a novel manner.

Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a top plan view of a switch constructed in accordance with my invention; Fig. 2 is a side elevational view of the wheel-operated member that corrects misplacement of the switch-points and also holds them locked; Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is an enlarged vertical sectional view of the wheel-operated member and the rail alongside of which it is arranged, this view showing a perfect wheel traveling upon said rail; Fig. 5 is a view similar to Fig. 4 for the purpose of illustrating how an imperfect wheel or double flanged wheel cooperates with my improved wheel-operated member; and Fig. 6 is a detail view that

illustrates the ribs on the under side of the link-supporting bracket.

Referring to Fig. 1 of the drawings which illustrate the preferred form of my invention, 1 and 2 designate rails that form a track, and 1<sup>a</sup> and 2<sup>a</sup> designate switch-points that cooperate with said rails. The switch-points are connected to a head rod 3 that is adapted to be operated manually or by some suitable mechanical, electrical, or pneumatic means, not shown, for shifting the switch-points laterally, and a wheel-operated member A is arranged longitudinally of the rail 2 adjacent the switch-points for correcting misplacement of said switch-points and also for holding them locked while a train is passing through the switch. This wheel-operated member A is carried by a plurality of pivotally mounted links which permit said member to move longitudinally of the rail 2 whenever said member projects above the tread of said rail and is engaged by the wheel of a train that enters the switch, the movement of said wheel-operated member being transmitted to the head rod 3 by means of a rod 4 connected to said member and to a bell crank lever 5 that is connected to the head rod. In the construction herein shown the wheel-operated member is carried by four links 6, two of which are arranged midway the center of said member and one end thereof, and the other two links being arranged midway the center and the other end of said member. The upper ends of said links are pivotally connected to the wheel-operated member A by means of pins 7 riveted to said member and projecting laterally therefrom through holes in the upper ends of the links, the outer ends of said pins preferably terminating flush with the outer side faces of the links so as to eliminate lateral projections on the wheel-operated member. Each pair of links 6 is carried by a bracket or support comprising a base portion 8 that projects under the base flange of the rail 2, a portion 9 that partially embraces the base flange of said rail and is connected to the vertical web thereof, as shown in Fig. 4, and an angularly disposed depending flange 10 formed integral with the base portion 8 and reinforced and strengthened by means of ribs 11 on the under side of said base portion. The links 6 are disposed at approximately the same angle as the flange 10 of the supporting bracket, and the



lower ends of said links are pivotally connected to said flange by suitable fastening devices, such, for example, as the bolts 12. Preferably, the head of each bolt is arranged  
 5 between a pair of the ribs 11, as shown in Fig. 6, so as to prevent the bolt from turning. On the front side of the rail web-engaging portion 9 of each bracket are a plurality of inclined ribs 13 that form a guiding surface or  
 10 bearing surface for the wheel-operated member A and prevent it from moving inwardly toward the rail 2. Said wheel-operated member is prevented from moving outwardly, away from the rail 2, by means of  
 15 guiding devices 14 arranged adjacent the end of the wheel-operated member and each provided with an upwardly projecting portion 14<sup>a</sup>, as shown in Fig. 3, that bears against the outer face of the wheel-operated member  
 20 and thus prevents it from moving outwardly. Each of said guiding devices 14 also has a portion 14<sup>b</sup> that extends over the base flange of the rail 2 and is connected to the vertical web thereof, said base portion being con-  
 25 nected to one of the track ties by a spike or other suitable fastening device. These supporting brackets and guiding devices not only guide the wheel-operated member A perfectly and prevent it from moving outwardly  
 30 or being jammed up against the rail, but they tend to prevent the rail 2 from creeping longitudinally because each supporting bracket is interposed between two track ties, as shown in Fig. 2, and each guiding device  
 35 14 is connected to a track tie and to the web of said rail. As shown clearly in Fig. 1, the rod 4 that transmits the movement of the wheel-operated member to the bell crank 5 is arranged at an angle to the wheel-operated  
 40 member instead of extending parallel to said member, the pivot pins, which connect the opposite ends of said rod to the wheel-operated member and to said bell crank, being out of longitudinal alinement with each  
 45 other. I prefer to arrange said parts in this manner so as to cause the wheel operated member to tend to move inwardly toward the rail 2 as it moves longitudinally thereof instead of outwardly as would be apt to  
 50 occur if the rod were connected to the bell crank 5 at a point inside of or in longitudinal alinement with the connection between said rod and wheel-operated member.

The rod 4 that transmits the movement of  
 55 the wheel-operated member A to the head rod 3 has an adjustable head 4<sup>a</sup> that is pivotally connected to a laterally projecting lug 15 on the wheel-operated member so as to enable the length of the rod 4 to be varied  
 60 and thus locate the wheel-operated member in the proper position relatively to the switch-points and the tread of the rail 2. The bell crank lever 5 is pivotally connected to a supporting plate 16 which is fastened to  
 65 the track ties and one arm of said lever is

provided with an elongated slot 17 into which a pin 18 on the head rod 3 projects. I prefer to have the end portions of said elongated slot 17 of greater width than the diameter of the pin 18 so as to prevent snow  
 70 or any other foreign substance from becoming clogged in the ends of said slot as would be apt to occur if the slot were of the same width as the diameter of the pin 18. In  
 75 other words, I form the slot 17 in such a manner that any snow or foreign matter which gets into same can escape laterally out of the path of the pin 18 when said pin travels toward the end of the slot. The pin 18, which projects upwardly through the slot in  
 80 the bell crank 5, is not provided with a head but upward movement of the bell crank relatively to the head rod is prevented by means of an extension 19 on the bell crank that projects under a flange 20 on the end of the head  
 85 rod, as shown in Figs. 1 and 3. I also prefer to provide the supporting plate 16 with an arm 16<sup>a</sup> that extends over the bell crank 5 so as to overcome any tendency of said bell crank moving upwardly.  
 90

The wheel-operated member A is so connected to the head rod 3 that the tread surface of said member will lie approximately flush with the tread surface of the rail 2 when the switch-points are in proper position;  
 95 namely, when the switch-point 1<sup>a</sup> lies snugly against the rail 1 or the switch-point 2<sup>a</sup> lies snugly against the rail 2, so that whenever said head rod does not move far enough to position the switch-points properly, the  
 100 wheel-operated member will project slightly above the tread of the rail 2. Consequently, when a train approaches the switch the wheel that is traveling on the rail 2 will engage the wheel-operated member A and move it  
 105 downwardly and also longitudinally in the direction indicated by the arrow *b* in Fig. 1, and thus move said misplaced switch-point into its proper position. For example, suppose that when the head rod was thrown in  
 110 the direction indicated by the arrow *a* in Fig. 1, to close the siding, said rod did not move far enough to bring the switch-point 1<sup>a</sup> tightly against the rail 1. This would cause the wheel-operated member A to pro-  
 115 ject slightly above the tread of the rail 2 so that the next train that approached the switch would depress said member and thus cause the switch-point 1<sup>a</sup> to move up close to the rail 1 before the wheels of said train  
 120 passed onto said switch-point. The links 6 which carry the wheel-operated member, are mounted in such a manner that they swing clear over from the position shown in full lines in Fig. 2 into the position shown in  
 125 broken lines in said figure whenever the head rod 3 is moved to bring the switch-point 2<sup>a</sup> up against the rail 2, the wheel-operated member coming to rest with its tread surface approximately flush with the tread surface of  
 130



the rail 2. If the head rod is not moved far enough in this direction to bring the switch-point 2<sup>a</sup> tightly against the rail 2 the wheel-operated member will, of course, project slightly above the rail 2 so that when a train approaches the switch the wheels of the train will engage said member and depress it and move it longitudinally in the direction indicated by the arrow *c* in Fig. 1, thus completing the throw of the head rod and moving the switch-point 2<sup>a</sup> into its proper position before the wheels of the train come into contact with same.

The wheel-operated member A not only corrects misplacement of the switch-points but it also holds said switch-points locked while a train is passing through the switch.

As previously stated, the wheel-operated member A is so formed that it will cooperate with a perfect wheel or an imperfect or "double-flanged" wheel. It is well-known that the tread surface of a car wheel becomes concaved or "double-flanged" after it has been in use for a short while on account of the wearing away of the tread of the wheel and the lateral movement of the wheel relatively to the rail and I have therefore provided the tread surface of the wheel-operated member A with a portion that is adapted to be engaged by the tread of a perfect wheel and a portion that is adapted to be engaged by the tread of an imperfect or double-flanged wheel. In Fig. 4 I have shown a perfect wheel resting upon the rail 2 and wheel-operated member, and in Fig. 5 I have shown an imperfect wheel resting on said rail and member. The tread surface of the wheel-operated member comprises a portion 21 that is adapted to be engaged by the tread of a perfect wheel, as shown in Fig. 4, and also a portion 22 that conforms to the outside flange or outer concaved portion of an imperfect wheel and is adapted to be engaged thereby, as shown in Fig. 5. By forming the wheel-operated member in this manner I can make it heavy enough to withstand the strains and shocks to which it is subjected and also insure that it will be operated by either a perfect wheel or an imperfect wheel. I prefer to bevel each end portion of the tread surface of the wheel-operated member at 23, as shown in Fig. 1, so as to gradually guide an imperfect wheel onto the portion 22 of the tread surface of said member that conforms to the outer flange of said imperfect wheel.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a railway track structure, a wheel-operated member, a movable element, and a connection between said member and element comprising a lever having an elongated slot provided with enlarged ends which are of greater width than the central or inter-

mediate portion of the slot, and a pin projecting into said slot and connected to a part that the lever moves.

2. In a railway track structure, the combination of a pivotally mounted lever provided with an elongated slot having enlarged ends which are of greater width than the central or intermediate portion of the slot, a reciprocating member, and a pin or projection on said member of less diameter than the end portions of said slot and projecting into said slot.

3. In a railway track structure, the combination of a horizontally disposed pivotally mounted lever provided with an elongated slot having enlarged ends, a movable member having a pin or projection that extends into said slot, and cooperating means on said lever and member, for preventing said lever and member from moving vertically relatively to each other.

4. In a railway track structure, the combination of a horizontally disposed bell crank lever provided in one of its arms with an elongated slot having enlarged ends, a reciprocating member arranged under said arm and provided with a pin that fits loosely in said slot, and a device on said reciprocating member that extends over a portion of said lever and thus prevents it from moving upwardly.

5. In a railway track structure, the combination of a track rail, a wheel-operated member arranged adjacent said rail, devices which are pivotally connected to said member so as to support it and move it longitudinally of the rail, and independent means arranged adjacent the ends of said member and secured to the ties on which the rail rests for guiding said member and preventing it from moving laterally relatively to the rail.

6. In a railway track structure, the combination of a rail, a wheel-operated member arranged longitudinally of the rail and adjacent one side thereof, supporting devices carried by the rail and provided with guides against the inside face of which said wheel-operated member bears, means connected to said supporting devices for carrying said wheel-operated member, and means independent of said supporting devices and connected to the ties on which said rail rests for preventing said wheel-operated member from moving outwardly away from the rail.

7. In a railway track structure, the combination of a track rail, a wheel-operated member arranged longitudinally of said rail adjacent one side thereof, a supporting device connected to said rail between two of the ties on which said track rail rests and provided with a depending flange that projects downwardly between said ties and is disposed at an angle to the web of said rail, a pair of links pivotally connected to said depending flange



for carrying said wheel-operated member, and inclined guides on said supporting devices against which the inner face of the wheel-operated member bears.

5 8. In a railway track structure, the combination of a track rail, a wheel-operated member arranged longitudinally of said rail adjacent one side thereof, supporting devices connected to said rail and provided with de-  
10 pending flanges that are disposed at an angle to the web of said rail, links pivotally connected to said depending flanges for carrying said wheel-operated member, inclined ribs on  
15 said supporting devices that act as guides for said member and limit the inward movement thereof, base portions on said supporting devices that project under the base flange of the rail, and ribs or gussets on the under  
20 side of said base portions that reinforce and strengthen said depending flanges.

9. A wheel-operated member for railway track structures, provided with a tread portion that conforms to a perfect wheel, a tread portion that conforms to an imperfect wheel,  
25 and an angularly disposed surface for guiding an imperfect wheel laterally onto said tread portion that conforms to an imperfect wheel.

10. A wheel-operated member for railway track structures, provided with an approxi-  
30 mately horizontally disposed tread portion that is adapted to cooperate with perfect wheels, and an angularly disposed portion that is adapted to cooperate with imperfect or double-flanged wheels, the ends of said  
35 horizontally disposed portion being so formed that an imperfect wheel will be shifted laterally and guided onto said angularly disposed portion.

11. In a railway track structure, a track  
40 rail, a wheel-operated member consisting of a bar that extends longitudinally of said rail adjacent one side thereof, said bar having a horizontally disposed tread surface that normally lies approximately flush with the tread  
45 surface of said rail, the combined width of the tread surface of the rail and the horizontally disposed tread surface of said bar being

less than the width of the tread surface of a car wheel, an angularly disposed tread surface on said bar for cooperating with imper- 50  
fect or double flanged car wheels, and means on said bar for guiding an imperfect wheel laterally so that its tread will engage said angularly disposed tread surface.

12. In a railway track structure, a track 55  
rail, an angularly disposed wheel-operated member arranged longitudinally of said rail adjacent one side thereof, supporting devices for said member which permit it to move longitudinally of the rail, a movable ele- 60  
ment, and a rod connected to said element and to the wheel-operated member in such a manner that said rod tends to force the wheel-operated member inwardly toward the rail as it moves longitudinally of said rail. 65

13. A switch comprising switch-points, means for shifting said switch-points, a wheel-operated member consisting of a bar that is arranged adjacent one side of one of the track rails, said bar being provided with 70  
an approximately horizontally disposed tread surface for cooperating with perfect wheels and an angularly disposed tread surface for cooperating with imperfect or double-flanged wheels, supporting devices for 75  
said bar which permit it to move longitudinally, and a connection between said bar and the switch-point shifting mechanism.

14. In a railway track structure, a rail, a supporting device carried by said rail, a 80  
wheel-operated member, links connected to said member for supporting same, bolts for connecting said links to said supporting device, and pairs of ribs or projections on said supporting device that embrace the heads of 85  
the bolts to prevent them from turning.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this first day of March 1909.

HARRY F. ROACH.

Witnesses:

WELLS L. CHURCH,  
GEORGE BAKEWELL.