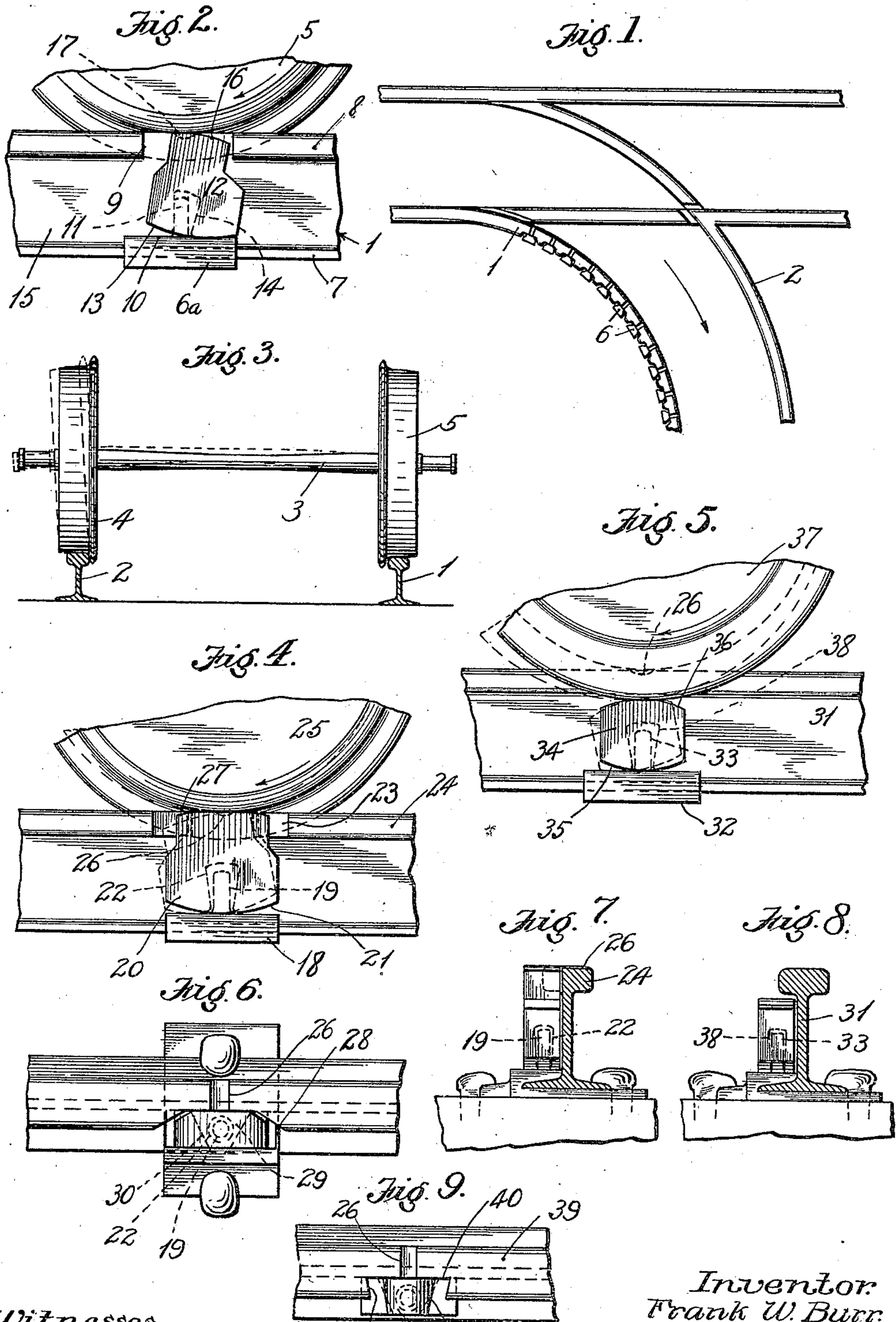


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 DEVICE TO PREVENT FRICTION ON RAILROAD CURVES.
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960,812.

Patented June 7, 1910.



Witnesses.
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UNITED STATES PATENT OFFICE.

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DEVICE TO PREVENT FRICTION ON RAILROAD-CURVES.

960,812.

Specification of Letters Patent.

Patented June 7, 1910.

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To all whom it may concern:

Be it known that I, FRANK W. BURR, a citizen of the United States, residing at Monrovia, in the county of Los Angeles and State of California, have invented new and useful Improvements in Devices to Prevent Friction on Railroad-Curves.

This invention relates to a device, the purpose of which is to increase the facility with which the wheels of railway cars may pass curves. According to ordinary railway practice, the wheels of the cars are rigid on the axles and this tends to produce a grinding or slipping action on one of the wheels when the car trucks pass around sharp curves. Such a grinding or slipping must occur on account of the fact that the wheel running on the outer rail of the curve tends to pass a greater distance than the wheel running on the inner rail, but, as the wheels are rigid on the axle, there is a tendency to produce a torsion in the axle and a sliding or slipping movement of one of the wheels on its rail.

The object of this invention is to produce a device which will operate in such a way as to prevent the grinding or slipping action referred to above, and which will also overcome the tendency to produce strains in the axle as suggested above.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

In the annexed drawing which fully illustrates my invention, Figure 1 is a plan showing a short portion of a railway curve to which my invention is applied. Fig. 2 is a side elevation showing a portion of the outer side of the inner rail and illustrating one form of my invention. Fig. 3 is an elevation showing a car axle with its wheels rigidly attached and indicating in dotted lines the manner in which the forces at a curve tend to distort the axle and wheels from their normal planes or position. Fig. 4 is a view similar to Fig. 2 but showing the device as applied on a track where cars are supposed to pass in both directions. Fig. 5 is a view similar to Fig. 4 but looking on the inner side of the inner rail and showing a modified form of the invention. Fig. 6 is a plan of the device shown in Fig. 4. Fig. 7 is a vertical section through a rail at the point where the device shown in Fig. 4 is

applied, the device being shown in elevation. Fig. 8 is a view similar to Fig. 7 but showing the device illustrated in Fig. 5. Fig. 9 is a plan showing a short portion of a rail to which the device is applied in a modified form.

Referring more particularly to the drawing and especially to Figs. 1 to 3, 1 and 2 represent respectively the inside and outside rails on a curved track.

Referring to Fig. 3, I will describe the forces which act on the car wheels and tend to produce the slipping and distortion to which I refer. In this view, 3 represents the axle to which the wheels 4 and 5 are rigidly attached. When the wheels are passing on the curve in the direction of the arrow indicated in Fig. 1, the centrifugal force and momentum of the car tend to force the outside wheel 4 against the outside rail 2 and the thrust in this direction which exists in the axle, tends to throw this wheel out of its normal vertical plane and toward the position in which it is indicated in dotted lines. This tends to distort the axle 3 and bend it or "bow" it upwardly. In addition to this it will be evident that as the wheel 4 tends to travel a greater distance than the inside wheel 5 it has a tendency to produce a slip or sliding of the inner wheel 5, and unless this slip occurs, a torsion must exist in the axle. This torsion and displacement produces strains throughout the entire mechanism.

In order to overcome these difficulties and to relieve the axle and wheels of the distortion suggested, I arrange in the inner rail a plurality of my devices 6, one form of which is illustrated in Fig. 6. This device comprises a base plate 6^a, the body of which passes under the flange 7 of the rail and is secured to the cross ties by suitable spikes. At the point where this base plate 6^a is placed the head 8 of the rail is cut away so as to form a notch 9. This plate 6^a extends over the flange 7 on one side of the rail and presents a flat horizontal face 10 from which a pintle or stud 11 projects vertically. On this face 10 a rocker 12 rests, said rocker being in the form of a block having a curved lower face 13 which is adapted to rock on face 10 as will be readily understood. At a suitable point in the face 13 a chamber 14 is formed which extends upwardly into the interior of the rocker as indicated. This chamber has a

constricted or choked mouth through which the pintle 11 passes upwardly into the chamber, and the upper portion of the chamber is enlarged so as to permit the block to rock in a vertical plane longitudinally of the rail. The side faces of the rocker 12 and the inner face of the rocker lie against the side of the web 15 of the rail as will be readily understood. This block or rocker 12 is not symmetrical but has an enlargement or lobe 16 on its right side as shown in Fig. 2 which tends to hold the rocker in an extreme position toward the right. The upper portion of the rocker 12 extends into the notch 9 and it presents a curved upper edge 16 which is substantially tangent with the plane of the upper face of the rail head. Near the middle of the notch 9 the upper face of the rail head is formed with a slight depression or transverse groove 17. When the car wheel 5 is passing over the rail it will be rotating in the direction indicated by the arrow in Fig. 2 and proceeding along the rail toward the right. When the wheel arrives at the depression 17 the wheel will be unsupported an instant and its face will come upon the face 16. This will cause the rocker 12 to swing over toward the left and this permits an increased rotation in the wheel 5 and enables this wheel to "catch up" with the wheel running on the outer rail. In this way I tend to equalize the rotation of the inside and outside wheels, and I also relieve the axle of the torsion which is produced by the unequal conditions in this respect.

In Fig. 4 I show a form of the device which is adapted for use where the cars pass in both directions instead of only in one direction. In this form of the invention I provide a base plate 18 which is similar to the base plate 6^a. It is similarly provided with a pintle 19 which projects upwardly at the side of the rail. In this case however, the rocker 20 is of symmetrical form so that it tends to maintain itself in an upright or plumb position. The lower side of the rocker is formed with a curved face 21 slightly flattened at the middle to form a seat, which rests on the base plate 18, and the pintle is received in an upwardly enlarging chamber 22. The upper portion of the rocker projects into a notch 23 formed in the side of the rail head 24, and when the wheel 25 arrives at the depression 26 in the upper face of the rail, it strikes the curved upper face 27 of the rocker. This moves the rocker as in the first instance with the effects aforesaid. It will be evident that with this form of the device, the rocker 5 swings in either direction so that it can operate on a wheel passing from the right or from the left. In this form of the invention I prefer to form the ends of the notch 23 with inclined faces 28 and I cut away the

under face 21 of the rocker slightly so as to leave a substantially triangular flat seat 29 upon which the rocker normally rests. The edges of this seat are indicated by the inclined dotted lines 30, and these edges or lines 30 are disposed preferably substantially at right angles to the faces 28. From this arrangement, when the rocker swings it will tend to rock on one of the edges 30, in other words, the rocker tends to swing away from the rail. Attention is called to the inclined faces 28 and to the fact that they assist in causing the rocker to swing away from the rail. This lateral movement of the rocker tends to take up the thrust in the axle which causes the distortion or "bow" illustrated in Fig. 3. As indicated in Fig. 7, the chamber 22 is much wider than the pintle 19 so that it permits the outward play or lateral movement of the rocker as suggested, but it fits closely at its mouth.

In cases where the weight of the rolling stock is not high I may provide a rocker which is adapted to support the wheel at the flange instead of on the face of the wheel as described above. I illustrate this arrangement in Fig. 5 in which 31 represents the rail under which I provide the base plate 32, and on the inner side of this rail the pintle 33 extends upwardly. The rocker 34 is in the form of a block presenting a curved lower face 35 resting on the upper face of the base plate, and it has a similar curved upper face 36 which is adapted to be engaged by the flange of the wheel 37 as shown. The rocker is provided with a chamber 38 receiving the pintle as shown and permitting a rocking movement of the block or rocker 34 when it is engaged by the wheel. As illustrated in Fig. 8, this chamber 38 is wider than the pintle 33 so as to permit a lateral movement or "play" of the rocker as will be readily understood.

The form of the invention shown in Figs. 4 and 6 is particularly advantageous in regions where snow falls. On account of the form of the notch 23, it will be evident that there is no tendency for the snow to clog the notch to prevent the operation of the rocker. Where these considerations are unimportant I may provide the construction shown in Fig. 9 in which 39 indicates the rail head provided with a notch 40, said notch being of key stone form, that is, having its greatest width on its bottom or inner face, and presenting inclined end faces 41 which converge in the direction of the side of the rail head. In this notch a rocker 42 is mounted in the form of a block, the upper portion of the block being tapered transversely so as to present faces 43 inclined similarly to the end faces 41 of the notch. In its general construction, this rocker is similar to the rocker 20 and operates in the same manner. If one

or more of the rockers should become inoperative for any reason, no injury whatever could be occasioned to the passing car.

Attention is called to the extreme simplicity of the device and to the fact that it has no finely adjusted parts liable to become deranged or get out of order. There will be no jar or shock transmitted to the wheel, truck or car as it passes over the rockers for the reason that when the wheel arrives at the depression in the rail it will immediately be supported by the rocker.

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

1. A railway curve having a curved rail, in combination, with a plurality of rockers mounted at the sides of said rail adapted to be engaged by the edge of the passing wheel having a limited rocking movement permitting a slip of the passing wheel with respect to the rail.

2. A railway curve having a curved rail, in combination, with a plurality of rockers mounted at the sides of said rail adapted to be engaged by the edge of the passing wheel, having a limited rocking movement permitting a slip of the passing wheel with respect to the rail, said rail having depressions in the upper face thereof permitting contact between the edge of the wheel and the rockers.

3. A railway curve having a curved rail, in combination, with a plurality of rockers mounted at the side of said rail and adapted to rock in a plane longitudinally of said rail, said rockers being arranged so as to permit a lateral movement thereof away from the plane of the rail, said rockers being adapted to engage the edge of the passing wheel to permit a slipping movement of said wheel with respect to the rail.

4. In a device of the class described, in combination, a rail having a head, a notch formed therein, a rocker mounted at the side of said rail and projecting upwardly into said notch, said rocker having a curved supporting face at the lower edge thereof and having a curved face at the upper side thereof adapted to contact with the passing wheel.

5. In a device of the class described, in combination, a rail having a head, a notch formed therein, a rocker mounted at the side of said rail and projecting upwardly into

said notch, said rocker having a curved supporting face at the lower edge thereof and having a curved face at the upper side thereof adapted to contact with the passing wheel, said rocker having a seat on the under side thereof upon which it normally rests, said seat having edges inclined to the axis of said rail and adapted to cause said rocker to move laterally from the rail when moved by the wheel.

6. In a device of the class described, in combination, a rail, a pintle mounted at the side of said rail and projecting upwardly, and a rocker having a chamber receiving said pintle adapted to rock longitudinally of the rail and having an upper curved face adapted to contact with the passing wheel.

7. In a device of the class described, in combination, a rail, a pintle mounted at the side of said rail and projecting upwardly, and a rocker having a chamber receiving said pintle adapted to rock longitudinally of the rail and having an upper curved face adapted to contact with the passing wheel, the upper face of said rail having a depression facilitating the contact between the wheel and said rocker.

8. In a device of the class described, in combination, a rail having a notch in the head thereof, said notch having inclined end faces, a base plate having an upwardly projecting pintle disposed at said notch, a rocker consisting of a block having a chamber receiving said pintle, having a curved lower face adapted to roll on said base plate and having a curved upper face substantially flush with the upper face of said rail and adapted to engage the face of the passing wheel.

9. In a device of the class described, in combination, a rail, a rocker mounted at the side of said rail adapted to rock in a plane substantially parallel with the longitudinal axis of said rail, the upper side of said rocker being adapted to engage the lower edge of a passing car wheel, and means tending to move said rocker laterally from the rail when it rocks.

In witness that I claim the foregoing I have hereunto subscribed my name this 8th day of December, 1909.

F. W. BURR.

Witnesses:

F. D. AMMEN,
EDMUND A. STRAUSE.