

No. 886,691.

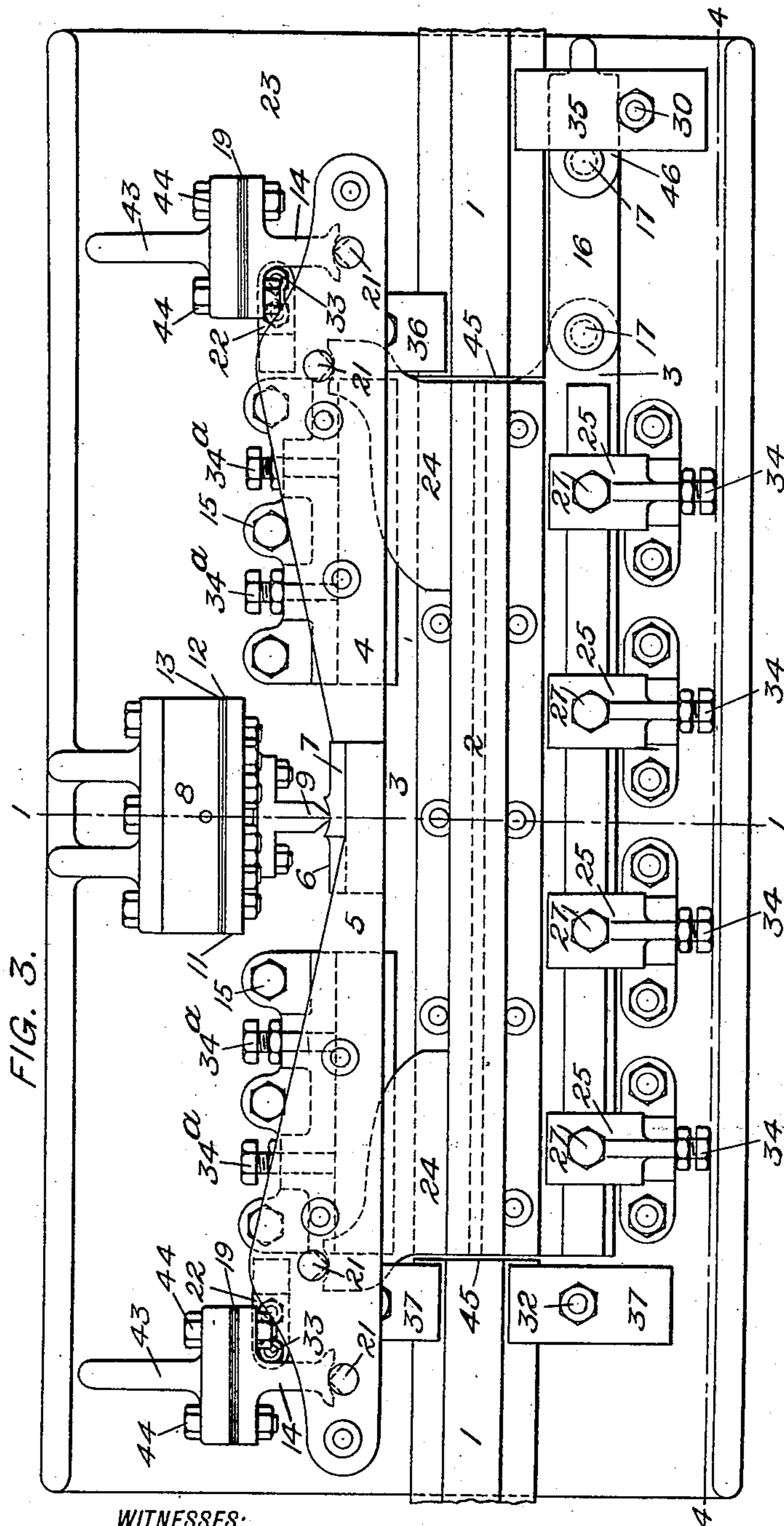
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G. L. FOWLER.

APPARATUS FOR TESTING WHEEL FLANGE PRESSURES.

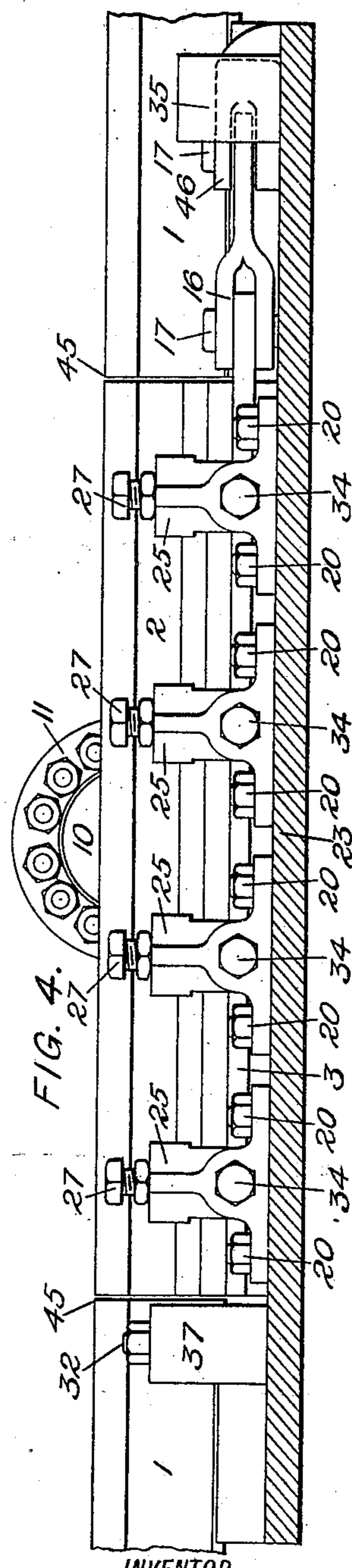
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2 SHEETS—SHEET 2.



WITNESSES:

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APPARATUS FOR TESTING WHEEL-FLANGE PRESSURES.

No. 886,691.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE L. FOWLER, a citizen of the United States of America, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Testing Wheel-Flange Pressures, of which the following is a specification.

My invention relates generally to pressure transmitting, indicating and registering mechanism, and consists specifically in an apparatus for indicating and registering accurately the lateral pressure produced upon the rails of a railroad track by the flanges of the wheels of a passing locomotive or car.

The best form of apparatus at present known to me embodying my invention is shown in the accompanying two sheets of drawings, in which:

Figure 1 is a cross section of the apparatus on line 1—1 of Fig. 3. Fig. 2 is an end elevation of same. Fig. 3 is a plan view, and Fig. 4 is a longitudinal section and elevation on line 4—4 of Fig. 3.

Throughout the drawings like reference figures indicate like parts.

One rail of the track is cut so as to leave a space between the ends 45, 45, of the rail 1, which rest upon the base plate 23, being held in position by the clamps 35, 36, 37, which are bolted to the base plate by the studs 30, 31 and 32. Within the space left by the cut away portion of the rail 1, is inserted the floating rail section 2, which is fastened to the movable plate 3 which plate rests upon the bottom rollers 29, 29, 29. These rollers are placed in narrow, shallow depressions on the upper surface of the base plate, as shown in Fig. 1, and have their axes parallel to the rail section 2.

Above the movable plate are placed the top rollers 28, 28. The left hand roller 28, looking at Fig. 1, is held down by the top roller guide 26, which is adjustable by means of the bolt 27 mounted in the inside roller guide or bracket 25, which is bolted to the base plate by the studs 20, 20. The right hand top roller 28 is held down by the roller holder 18, mounted in the outside roller bracket 15.

4 and 5 represent pressure transmitting levers, the inner ends of which interlock, as shown in Fig. 1. The lever 4 I call the inside lever, and 5 the outside lever on account

of the manner in which their ends interlock. The inside lever 4 is provided with a hardened steel fulcrum plate 6, the outside lever with similar hardened steel fulcrum plates 7, 7, all of which bear upon the knife edge 9, mounted upon the diaphragm plate 10 carried by the diaphragm 12 of the pressure cylinder 8. This diaphragm has the usual packing ring 13 and is held in place by the ring 11. The pressure cylinder 8 is filled with any suitable fluid such as oil and connected by the pipe 39 to any suitable indicating registering or recording device such as the pressure gage 40 which has the movable pointer 41 and the registering pointer 42, all of the usual construction.

The levers 4 and 5 have fixed fulcrums at 14, 14, which are adjustably bolted to the lugs 43, 43, on the base plate by studs 44, 44. These fixed fulcrums are adjustable toward and from the rail by means of the shims 19, 19. The levers are supported in position by supporting blocks 22, 22, held in place by bolts 33, 33. They are provided with hardened steel fulcrum pins 21, 21, which bear against the fixed fulcrums 14, 14, and against the main fulcrums 24, 24, which are bolted to the web of the rail section 2.

16 is a plate link pivotally connected at one end to the movable plate 3 and at the other end to a lug 46 on the base plate by the pins 17, 17.

34, 34, are rail holding studs on the inside of the rail mounted in the roller guides or brackets 25, 25, and 34^a, 34^a, are similar rail holding studs on the outside of the rail mounted in the outside roller brackets 15. These studs 34 and 34^a bear against the edges of the movable plate 3.

The diaphragm knife edge 9 is rendered adjustable toward and from the diaphragm by the interposition of the shims 38.

Such being the construction of my invention, its mode of operation is as follows: The top and bottom rollers being adjusted so as to permit the movable plate 3 to move smoothly at right angles to the rail without permitting the rail section 2 to tip, the various fulcrum bearings and knife edge bearings being adjusted by the introduction of the proper shims, the rail holding studs 34 are screwed in until all parts of the lever and pressure indicating system are brought to a bearing and the indicator hand on the gage is just on the point of starting from zero.

The inside roll holding studs 34^a are then backed away slightly so as to give the supporting movable plate 3 sufficient motion to produce the limit of pressure registrable on the pressure indicating device. When a train passes over the track, it is evident that the vertical pressure produced by the weight of the wheels will not be indicated or registered, but that any lateral thrust of the wheel flanges will tend to force the rail section 2, and the plate 3 to the right (looking at Fig. 1) with the result that the said pressure will be transmitted through the main fulcrum 24 to the fulcrum pins 21 on the levers 4 and 5, to the fixed fulcrums 14, 14, and to the knife edge 9. As a result a definite proportion of the sum of the pressures applied to both lever fulcrums will be transmitted to the diaphragm plate 10 and through the diaphragm 12 and liquid in the pressure cylinder to the gage 40 or other indicating, registering or recording apparatus. Any longitudinal thrust upon the rail section 2 resulting from the tractive effort of the engine driver wheels, or the retarding action of the brakes set upon any of the wheels, will be taken up by the plate link 16 without permitting the plate 3 or rail section 2 to be forced against the abutting rail ends, and consequently no frictional resistance to the lateral movement of the rail section will be thereby created.

The advantages of my invention comprise the accuracy of its indicating and registering action, all variable frictional resistances being eliminated, its ease of adjustment, the firmness with which the floating rail section is held in position and permitted to make only the slightest lateral movement necessary to register the flange pressures, and its ease of assembly of the various parts. By the arrangement of double levers operating upon a single pressure indicating device, I am able to obtain accurate indication of the lateral thrust no matter at what point of the floating rail section the flange presses.

Various changes could be made in the details of construction illustrated and described without departing from the spirit and scope of my invention, so long as the principle of operation and the relative coöperation of parts above described be substantially preserved.

It is understood, of course, that the rail clamps 35, 36 and 37 serve to hold the base plate firmly to the rail 1, 1, and so keep the floating rail section 2 substantially in line with the rest of the rail.

Having, therefore, described my invention, I claim:

1. The combination with a railroad track comprising the usual pair of fixed rails, of a movable rail section located in line with one of said rails and not connected to the other rail, a supporting bearing for said movable rail section which permits it to move only in a

horizontal plane, and lateral pressure registering apparatus connected to said movable rail section.

2. The combination with a pair of fixed rails and supports therefor, of a floating rail section, and means for indicating the lateral pressures applied to said floating rail section, said means comprising a hydraulic pressure registering apparatus connected to said floating rail section.

3. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section.

4. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with top rollers above said plate, and adjustable roller guides above said top rollers.

5. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with a pressure indicating device and a system of levers interposed between one edge of the movable plate and the indicating device.

6. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with adjustable studs for limiting the lateral movement of the plate.

7. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with a link pivoted to said plate, and to the base plate in line with the endwise thrust of the floating rail section.

8. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with a double system of independent levers each having a fixed fulcrum on the base plate, a main fulcrum carried by the floating rail section and engaging each lever, and a common pressure indicating device with which both levers engage.

9. The combination of the base plate, a floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with a double system of independent levers each having a fixed fulcrum on the base plate, a main fulcrum carried by the floating rail section and engaging each lever, and a common

pressure indicating device with which both levers engage, and adjustable means for limiting the lateral movement of the plate.

10. The combination of the base plate, a
5 floating rail section and movable plate, and bottom rollers between said movable plate and bed plate, the axes of said rollers being parallel to the rail section, together with a double system of independent levers each
10 having a fixed fulcrum on the base plate, a main fulcrum carried by the floating rail section and engaging each lever, and a common

pressure indicating device with which both levers engage, anti friction means for taking up all longitudinal thrust of the floating rail
15 section, and adjustable means for limiting the lateral movement of the plate.

Signed at New York, N. Y. this 20th day of July, 1907.

GEORGE L. FOWLER.

Witnesses:

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