(No Model.) 3 Sheets—Sheet 1.

H. L. VAN ZILE.

TRACTION MECHANISM.

No. 399,299. Patented Mar. 12, 1889.

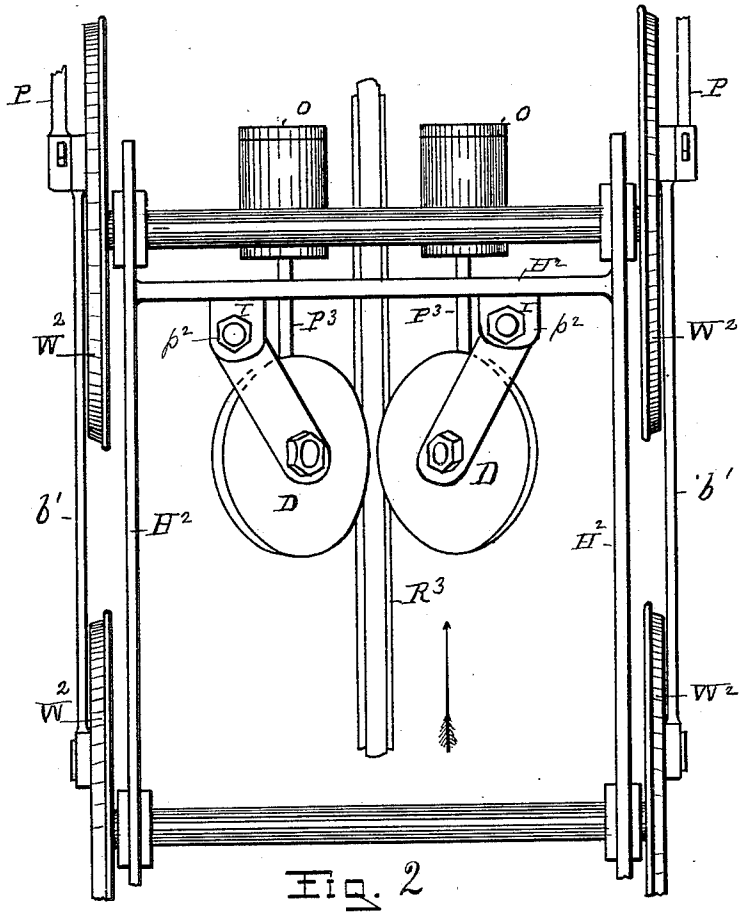


Fig. 2

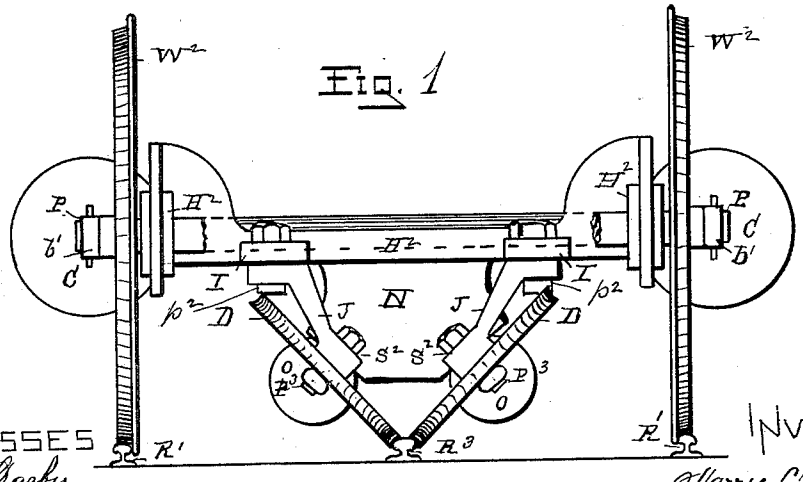


Fig. 1

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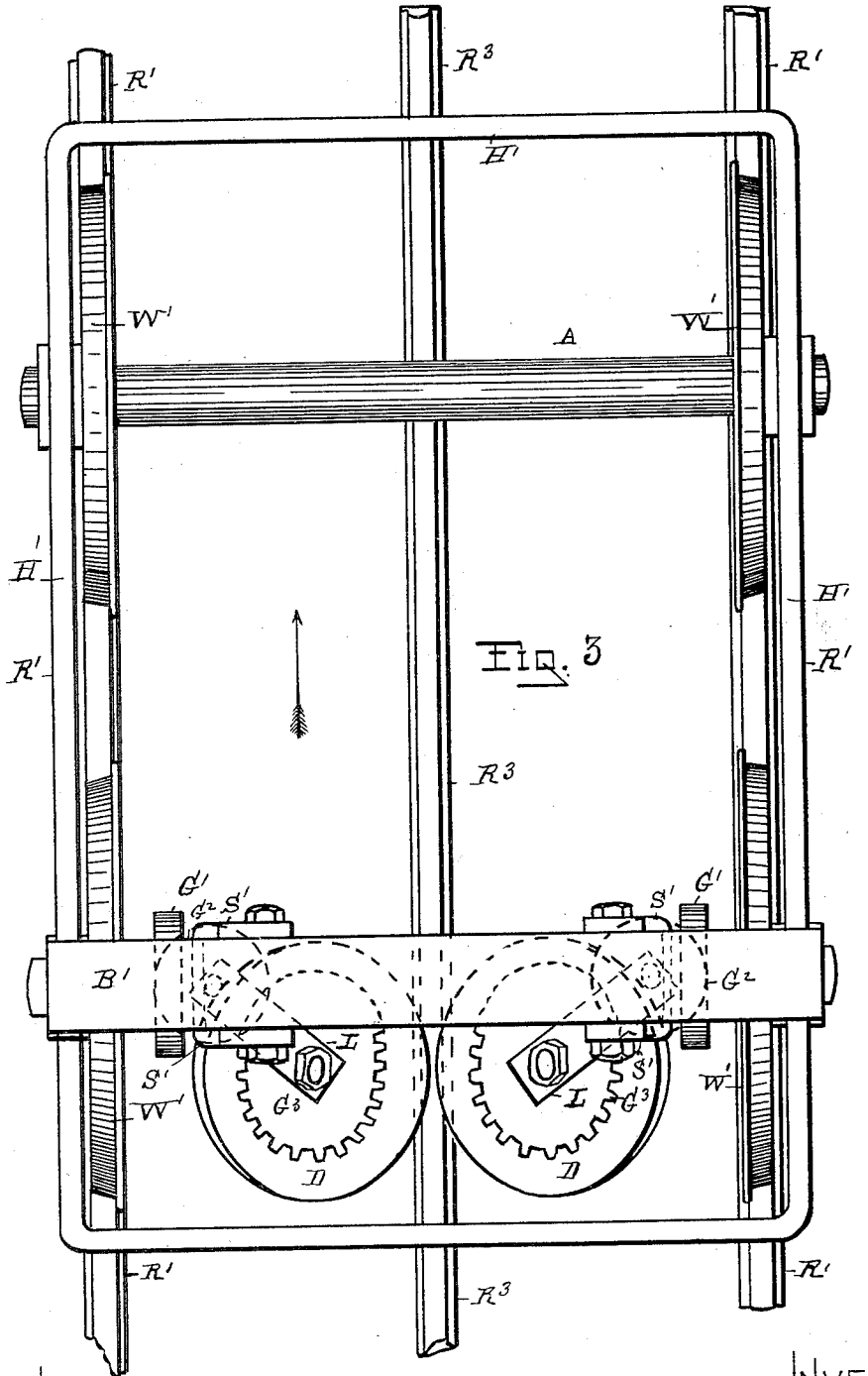


Fig. 3

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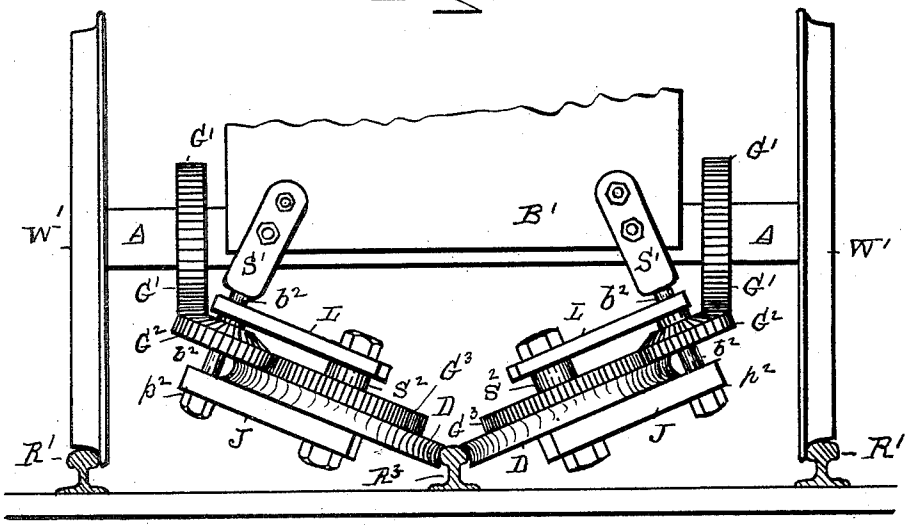
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Fig. 4



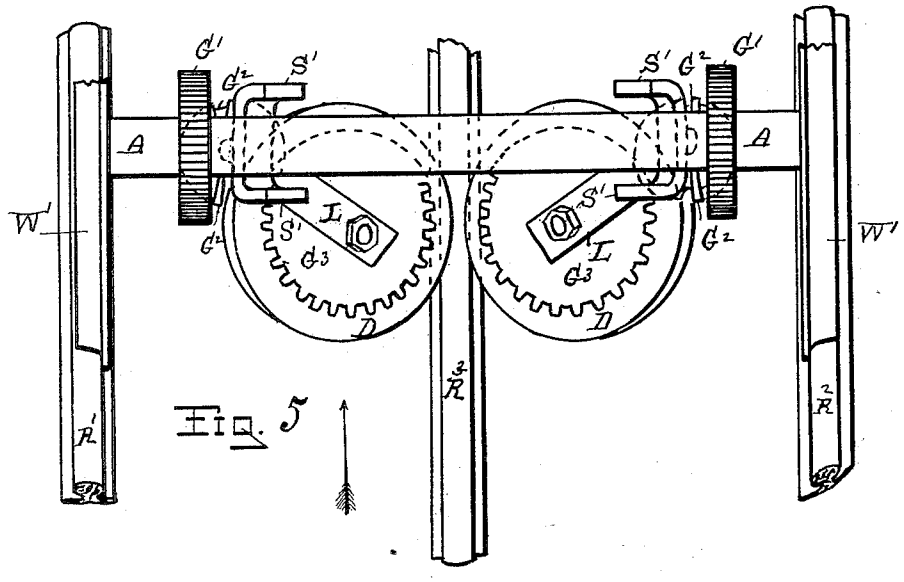


Fig. 5

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UNITED STATES PATENT OFFICE.

HARRY L. VAN ZILE, OF ALBANY, ASSIGNOR OF TWO-THIRDS TO OSCAR E. VAN ZILE, OF TROY, AND JOHN MACCORMACK, OF ALBANY, NEW YORK.

TRACTION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 399,299, dated March 12, 1889.

Application filed October 30, 1888. Serial No. 289,543. (No model.)

To all whom it may concern:

Be it known that I, HARRY L. VAN ZILE, of the city of Albany, county of Albany, and State of New York, have invented a new and useful Traction Mechanism, of which the following is a specification.

My invention relates to a mechanism for the tractional propulsion of street-cars, locomotives, and other vehicles that are designed to be used in connection with a rail-track on which they are moved, it being the object and purpose of my invention to utilize a three-rail track in which two of the rails as usually placed are arranged to support the weight of the vehicle (and for propulsion when desired) and a center rail which is employed in connection with traction-wheels or drivers that are made to engage with the sides of the center rail, my invention herein described being an improvement upon that shown and described in an application for Letters Patent filed by me in the Patent Office February 27, 1888, and known as "Serial No. 265,452," to adapt it to modified uses.

Accompanying this specification to form a part of it there are three plates of drawings containing five figures illustrating my invention, with the same designation of parts by letter-reference used in all of them.

Of the illustrations, Figure 1 shows a rear end elevation of a locomotive-truck with my invention applied thereto. Fig. 2 shows a top view of the parts that are illustrated at Fig. 1 with the bracket-frame omitted, which supports the oscillating steam-cylinders operating my improved traction or driving wheels. Fig. 3 shows a top view of the hanger-frame of a street-car truck with my invention applied thereto. Fig. 4 shows a rear end elevation of the parts shown at Fig. 3. Fig. 5 shows a top view of the rear end wheels and axle of a street-car with that part of the truck-frame to which my improved traction or driving wheels are pivoted. In all of these illustrations my improved traction or driving wheels are shown as projected rearwardly on pivoted arms and as making a tangent engagement with the opposite sides of the center rail.

The several parts of the mechanism thus illustrated and those containing my invention are designated by letter-reference, and the function of the parts is described as follows:

The letters R′ R′ designate the ordinary and usual side rails of a rail-track, and R^3 a center or middle rail.

The letters D designate drivers or traction-wheels that are journaled onto the outer ends of bars or brackets which are attached to the truck, and so that the perimeter of each of said driving or traction wheels will tangent with the opposite sides of the center rail, R^3.

The letters H′ designate the hanger-frame of a street-car truck, and H^2 the hanger-frame of a locomotive-truck.

The letters W′ designate the ordinary wheels of a street-car truck, which are arranged to support the weight of the car upon the tops of the rails R′, to be operated for propulsion by power applied to the axles A in any well-known manner.

The letters W^2 designate the drivers of a locomotive, connected by the compensating bar b' and operated for tractional propulsion on the tops or treads of the rails by means of a pitman, P, and steam-cylinder C.

Where my invention is shown as applied to a street-car at Figs. 3, 4, and 5, the letters S′ designate stirrups, that are made to embrace the sides of the hanger-frame cross-bar B′ and to be bolted thereto. Each of these stirrups S′ has downwardly projected from its loop end and made integrally therewith a pivot-stud, b^2.

The letters J designate a bar that pivots at p^2 on each of the pivot-studs b^2 at the outer end thereof, and the inner end of each of them is made with a pintle-shaft, S^2, for each of the drivers D to turn on.

The letter G′ at Figs. 3, 4, and 5 designates a gear-wheel made to turn with the axles A and to mesh into a beveled gear-wheel, G^2, turning on the pivot-stud b^2, and this beveled gear-wheel G^2 meshes into a gear-wheel, G^3, arranged on and secured to each of the drivers D to communicate motion from the axle A to the said drivers D. The connecting-bar L pivots or links into the pivot-stud b^2 at one end and at its other end onto the shaft S^2 of the drivers D.

When power is applied to the axle A by an electric or other motor through the geared connection made between the said axle and the drivers, the latter are actuated to turn in the same direction as the wheels W′, and the drivers by means of their pivoted connection with the truck, when power is thus applied to them, are caused to press against the opposite sides of the center rail, so as so make a frictional traction therewith sufficient for propulsion.

As shown at Figs. 1 and 2, with my invention applied to a locomotive-truck, the drivers D are arranged to engage with the sides of the center rail, as in the other illustration, and the pintle-shafts S^2 of the drivers D are each arranged on the inner downwardly-projected ends of one of the bars J, which latter at their outer ends are pivoted at p^2 to one of the brackets I, each of which is projected rearwardly from the cross-bar of truck hanger-frame H^2.

In older devices wherein traction was employed for propulsion by means of wheels engaging with the opposite sides of a rail such traction was produced through power applied to the shafts of the traction-wheels by a mechanism operating independently of the mechanism which operated the said wheels for propulsion. By my improvement the mechanism which operates the traction-wheels for propulsion produces the traction when acting on a level, and when ascending a grade, in addition to the power applied for propulsion, the component force of gravity, operating in the line of the grade descent, increases the traction by crowding the traction-wheels toward the center rail, this result being caused by the action of the pivoted arms, on the outer or rear end of each of which one of the traction-wheels is supported and operated.

At Figs. 1 and 2 the drivers D are shown as being operated by a crank-connection made directly with the piston-rods P^3 of the oscillating steam-cylinders O, attached to the pendent support N, downwardly projected from the truck-frame.

As my invention relates more particularly to the drivers or friction-wheels D, arranged upon a pivotal connection made with the truck-frame and rearwardly extended therefrom, (with reference to the direction of propulsion,) so as to tangent with the opposite sides of a center rail, I do not limit my invention thereof to the particular method of communicating power to said drivers, and any well-known means that will operate them to perform the same function in relatively the same manner may be employed.

Where the traction utilized to operate cars or locomotives upon a rail-track is wholly produced by the frictional engagement caused by the weight of the vehicle upon the rails, the moving and drawing capacity of the locomotive will depend upon the weight of the latter. By my improvement an additional traction capacity is developed without an increase of weight in the locomotive, which becomes useful in various ways. When in operating upon a level the frictional traction of my drivers is wholly produced by the power applied to them, which forces them to engage with the sides of the center rail. When operating them upon an ascending grade, then the component force of gravity, acting in the direction of the grade descent, tends to crowd the supplemental drivers toward the opposite sides of the center rail.

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

1. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or car upon a two-rail track, of a center rail and traction-wheels or drivers operated to make a tractional engagement with the opposite sides of said center rail by the same mechanism that operates said traction-wheels or drivers for propulsion, substantially in the manner as and for the purposes set forth.

2. The combination, with a locomotive or street-car truck having wheels for supporting the weight of the locomotive upon a two-rail track and operated to engage with said two-rail track for propulsion, of a center rail and supplemental traction-wheels or drivers operated to make a tractional engagement with the opposite sides of said center rail by the mechanism operating them for propulsion, substantially in the manner as and for the purposes set forth.

3. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon the rail of a two-rail track, of a center rail, and traction-wheels or drivers arranged upon each side of said center rail that are operated to make a tractional engagement with the opposite sides thereof by the power operating them for propulsion, with each of said traction-wheels or drivers mounted upon an arm that at its front end is pivoted to the truck and therefrom extended rearwardly to receive the traction-wheel axles, substantially as and for the purposes set forth.

4. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon a two-rail track and operated to make a tractional engagement therewith for propulsion, of a center rail, supplemental traction-wheels or drivers operated to engage with the opposite sides of said center rail, and arms each of which at their front ends are pivoted to the truck and therefrom extended rearwardly to support the axles of the said supplemental drivers or traction-wheels, substantially as and for the purposes set forth.

5. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon the rails of a two-rail track, of a center rail and traction-wheels or drivers making a tan-

gent contact with the opposite sides of said center rail, and each of said drivers or traction-wheels mounted upon the rear end of an arm which at its front end is pivoted to the truck and therefrom extended on an angle to receive the axles of the said drivers or traction-wheels, substantially in the manner as and for the purposes set forth.

6. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon the rails of a two-rail track, of a center rail, arms that are each separately pivoted to the truck at their front ends and therefrom rearwardly projected on an angle, and a traction-wheel or driver mounted upon the rear end of each of said arms, with each of said traction-wheels or drivers making a tangent engagement with the opposite side of said center rail, substantially in the manner as and for the purposes set forth.

Signed at the city of Troy, New York, this 12th day of September, 1888, and in the presence of the two witnesses whose names are hereto written.

HARRY L. VAN ZILE.

Witnesses:
GEO. A. DARBY,
CHARLES S. BRINTNALL.