No. 646,609. Patented Apr. 3, 1900.

C. V. ROTE.

CAR BRAKE.

(No Model.) Application filed July 22, 1899.

5 Sheets—Sheet 1.

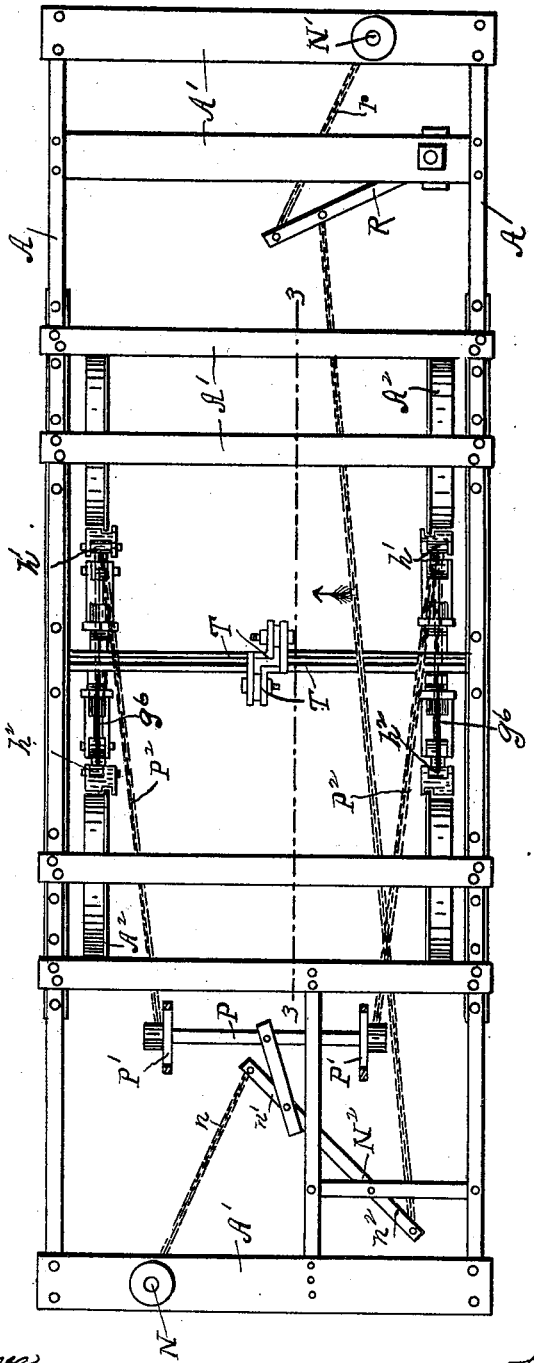

FIG. 1.

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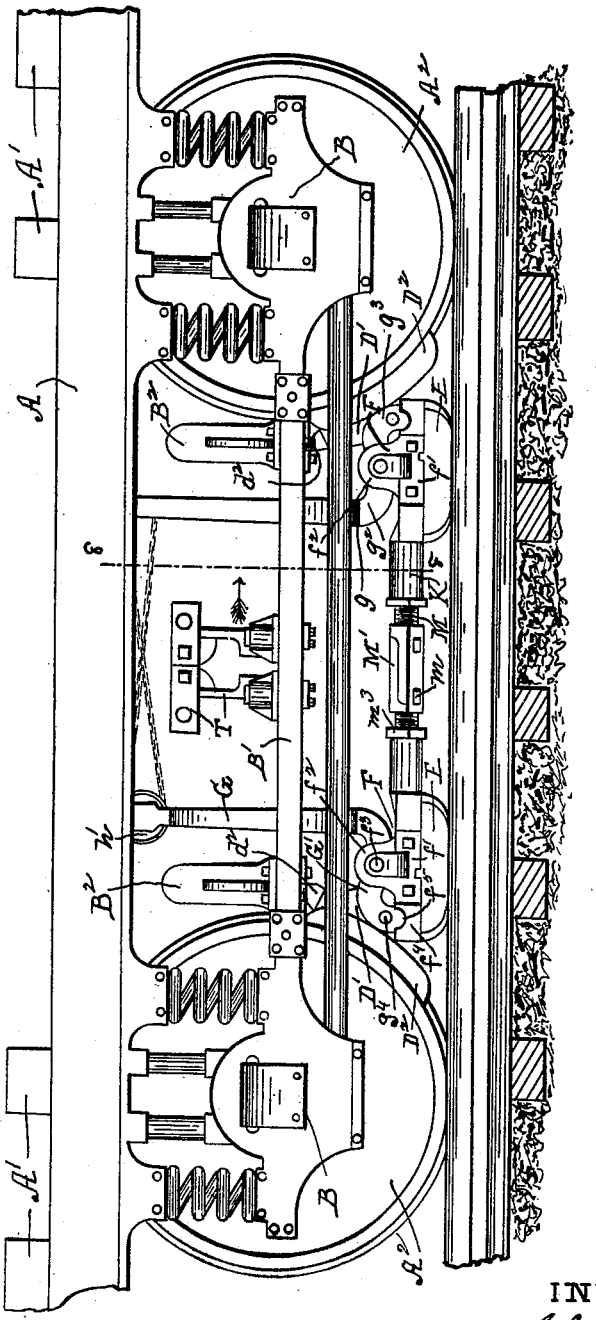

Fig. 2.

WITNESSES.

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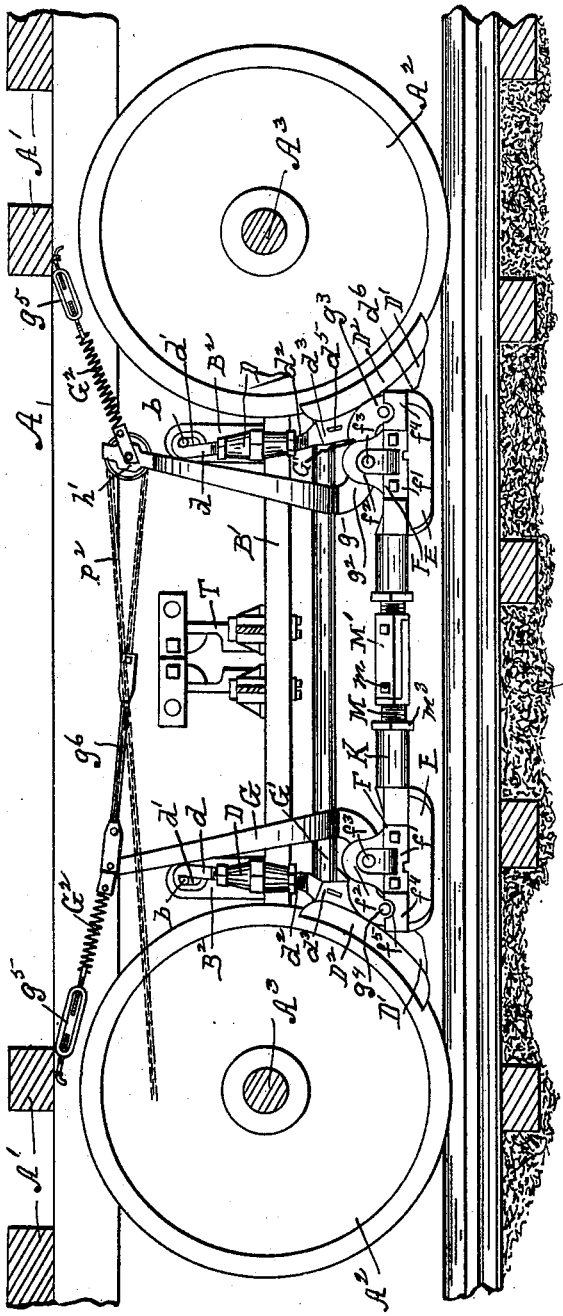

Fig. 3.

WITNESSES.

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(No Model.) 5 Sheets—Sheet 4.

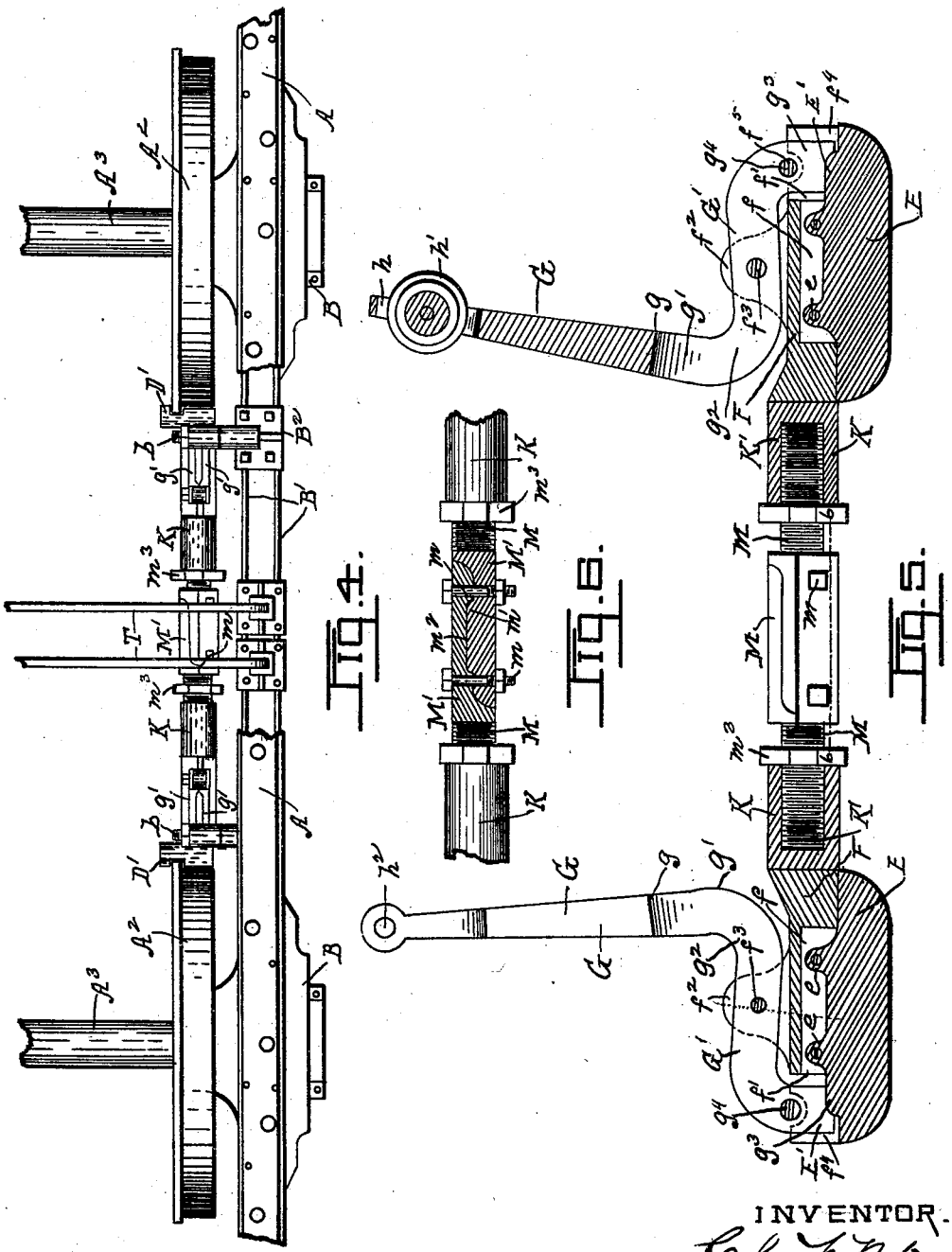

Fig. 4.

Fig. 6.

Fig. 5.

WITNESSES.

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(No Model.) (Application filed July 22, 1899.)

5 Sheets—Sheet 5.

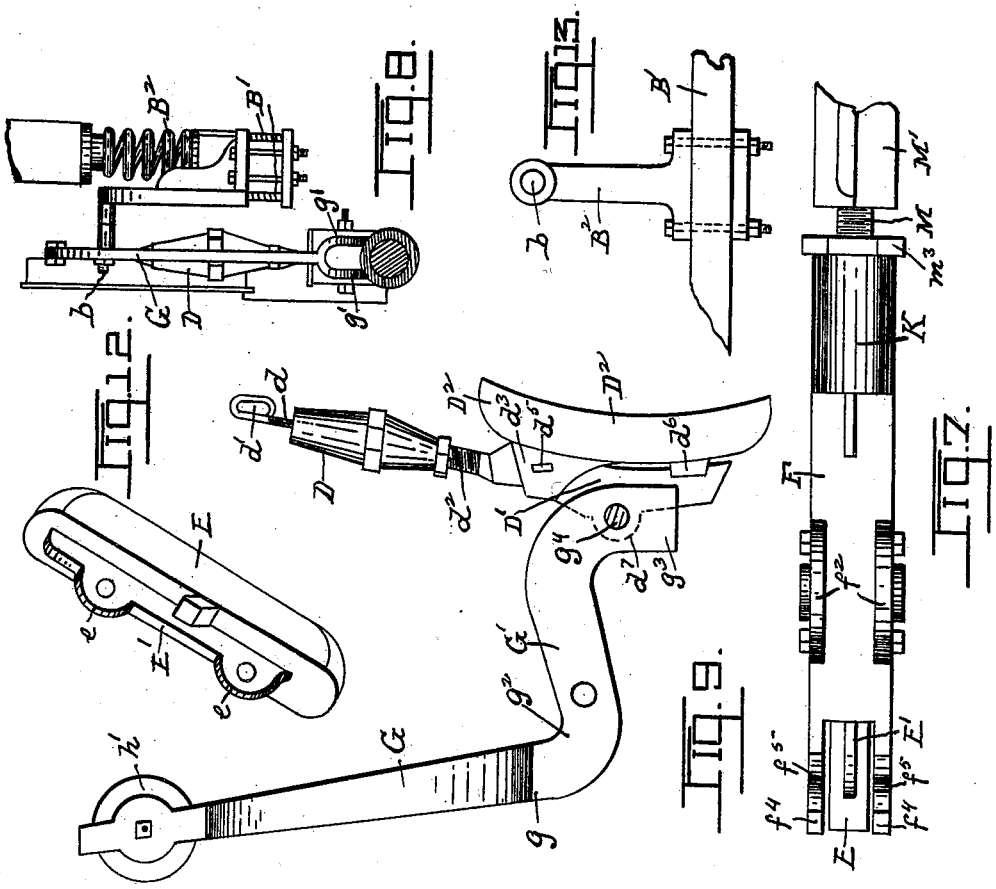

FIG. 8.

FIG. 13.

FIG. 12.

FIG. 7.

FIG. 9.

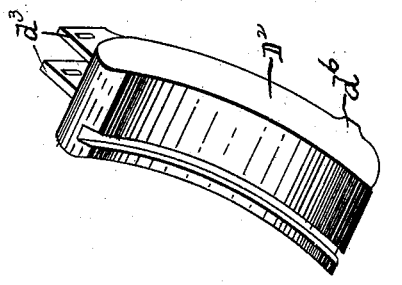

FIG. 10.

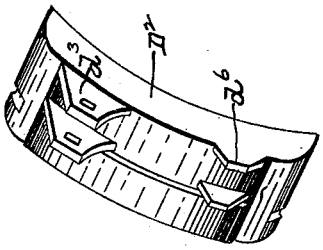

FIG. 11.

WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES V. ROTE, OF LANCASTER, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO RICHARD BLICKENDERFER, OF SAME PLACE.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 646,609, dated April 3, 1900.

Application filed July 22, 1899. Serial No. 724,737. (No model.)

To all whom it may concern:

Be it known that I, CHARLES V. ROTE, a citizen of the United States, residing at Lancaster, county of Lancaster, State of Pennsylvania, have invented certain Improvements in Car-Brakes, of which the following is a specification.

This invention relates to improvements in that class of car-brakes wherein a brake-shoe is applied to a rail of the track to retard or stop the movement of the car, and it is more particularly applicable to cars propelled by electricity or by any kind of motor.

The objects of my invention are, first, to retard the movement of a car more effectively and to stop it quicker than is done by the brakes now in use, and, second, to prevent the "burning" of the wheel when it "skids" under the pressure of the brake.

The invention consists in the combination, with a wheel brake-shoe, of a rail brake-shoe, a brake-lever fulcrumed on the rail brake-shoe through a pivot, and an operating connection between the brake-lever and the wheel brake-shoe.

The invention consists also in the combination of various details of construction, as hereinafter fully described, and then pointed out in the claims.

My invention is illustrated in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a top plan view of a car-truck, showing a mode of operating my improved brake; Fig. 2, an elevation of an outer side of the car-truck, the parts being shown in the positions occupied thereby when the brake-shoes are applied, respectively, to the rail and to the wheels; and Fig. 3, a vertical section on broken line 3 3 of Fig. 1, the brake-shoes and the parts connected therewith being shown in their normal positions. Fig. 4 is a top plan view of the brake-supporting frame on one side of the car-truck; Fig. 5, a longitudinal vertical section of the rail brake-shoes and the rail brake-blocks on one side of the truck and of their connections with the turnbuckle uniting them; Fig. 6, a longitudinal section of the coupling-joint between the brake-shoes on one side of the truck, taken on broken line 6 6 of Fig. 5; Fig. 7, an enlarged top view of one of the rail brake-blocks; Fig. 8, an enlarged vertical section of the brake, taken on line 8 8 of Fig. 2; and Fig. 9, an enlarged side view of a brake-lever, a wheel brake-shoe, and the support of the wheel brake-shoe. Fig. 10 is a perspective inner face view of a wheel brake-shoe; Fig. 11, a perspective outer face view of said brake-shoe; Fig. 12, a perspective top view of a rail brake-shoe, and Fig. 13 an inner face view of one of the standards supporting the wheel brake-shoes.

The drawings and the specification show and describe the application of my invention to a single truck, the description referring to the construction on one side of said truck.

Similar letters indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates the longitudinal members of a wooden rectangular truck-frame; A′, transverse members of said frame; A^2, the car-wheels, and A^3 the car-axles.

B indicates the car-axle boxes, and those on each side of the truck are connected by two parallel bars B′. On bars B′ and adjacent to car-wheels A^2 are secured standards B^2, and on the upper ends thereof are short inwardly-extending cylindrical arms *b*. Each arm *b* engages in a vertically-elongated eye *d*′ of a hanger or depending rod *d*, having its lower end threaded and taking into the upper end of an uprightly-disposed turnbuckle D, the lower end whereof engages a threaded extension d^2 on the upper end of the wheel brake-block D′, to which is secured the wheel brake-shoe D^2. On the upper end of the outer face of wheel brake-shoe D^2 are two outwardly-projecting jaws d^3, that embrace the upper end of wheel brake-block D′, through openings in which and in jaws d^3 said wheel brake-block and wheel brake-shoe are separably connected by a split key or pin d^5, and on the lower end of the outer face of wheel brake-shoe D′ are also formed two jaws d^6, that simply embrace the sides of wheel brake-block D′. On the outer face of said wheel brake-block D′ is a lug d^7, provided with an opening through which said wheel brake-block D′ is secured between the jaws of a brake-lever to be described. The turnbuckles D serve to

adjust the vertical positions of wheel brake-shoes D^2. Inside of each of the two wheels on the same side of the car-truck is a flat-rail brake-shoe E, adapted to be applied to the rail. This rail brake-shoe is pointed and rounded at the ends, so as to better take over any inequalites in the rail. On rail brake-shoe E is a centrally-located longitudinal rib E′, that engages a groove f in the under face of rail brake-block F, the sides f' of rail brake-block F resting on rail brake-shoe E outside of said rib E′, and on rib E′ are two perforated lugs e, through which perforations and corresponding perforations in sides f' of the rail brake-block the rail brake-shoe and said brake-block are bolted together, and on top of rail brake-block F are two upwardly-extending jaws f^2, embracing the outer faces of the jaws of the brake-lever.

A bent brake-lever G G′ is connected with each pair of brake-blocks just described, as clearly shown in Figs. 2, 3, 5, and 9, which levers are located behind wheel brake-blocks D′ and above rail brake-blocks F. The upright power-arm G of each of these levers is spread laterally, as shown at g, to form downwardly-extending jaws g', and said jaws are bent at g^2 toward wheel brake-blocks D′ and form the approximately-horizontal weight-lever arm G′. Both jaws of said arm G′ pass between jaws f^2 on rail brake-block F, to which they are pivotally secured by a bolt f^3. Lever-arm G′ is extended beyond jaws f^2 toward wheel brake-block D′ and has its outer ends g^3 turned downward between jaws f^4 of rail brake-block F and embracing lug d^7 on the back of wheel brake-block D′, to which it is pivoted by a bolt g^4. Jaws f^4 of rail brake-block F have recesses f^5 in their upper edges to receive the ends of bolt g^4 when lever-arm G′ is depressed in taking off the brakes.

In the outer end of the upright arm of one of each pair of brake-levers is a slot h, in which is a sheave h', and in the outer end of the other upright arm of each pair of brake-levers is an eye h^2.

On the contiguous ends of each rail brake-block F is formed a heavy horizontal cylindrical extension K, and said extensions have in their outer ends threaded sockets K′, engaged by heavy screws M. On the outer ends of screws M are thick plates M′, adapted to be bound together by bolts m, and on the meeting face of one of the plates M′ is a feather m', constructed to engage a groove m^2 in the meeting face of the other plate M′, and on the screws M are jam-nuts m^3. The brake-block extensions K, with the screws M and their connections, are a strut that prevents the rail brake-shoes from being forced outward from the car-wheels, and they form a turnbuckle, whereby the horizontal positions of said rail brake-shoes relative to the wheels may be regulated. The brake-shoes are normally held away from the rail and the wheels by springs G^2, each spring having one end secured to the upper end of a brake-lever and the other end to some part of the truck-frame outside of the lever, the tension of these springs being regulated by turnbuckles g^5. The movement of each brake-lever G G′ under the influence of its spring G^2 is limited by the engagement of bolt g^4 in recess f^5 of jaws f^4 of the rail brake-block F.

As will be observed, the action of each bent lever G G′ and its connected brake-blocks and brake-shoes is that of a pinch-bar, the rail brake-block F and brake-shoe E constituting the fulcrum-foot, adapted to bear on the track-rail, and the wheel brake-block D′ and brake-shoe D^2 the projecting snout taken under and adapted to bear against the car-wheel. When the brake-shoes are applied, the strain upon the brake-levers occasioned by the relative position of the rail brake-shoes is relieved by the reaction of the wheel brake-shoes through turnbuckle K M M′ and the horizontal arms G′ of levers G G′. The connection of wheel brake-shoe D′ with standard B^2 through arm b and the elongated eye d' of rod d permits the automatic adjustment of wheel brake-shoe D^2 to its proper bearing on the wheel when the brakes are applied, which adjustment is facilitated by the character of the connection between the brake-lever, the rail brake-block, and the wheel brake-block, these connections forming a toggle-joint between the axis of the wheel and the bolt pivoting the brake-lever to the rail brake-block.

When the brake is applied, the upward pressure from the rail brake-shoe on the wheel brake-shoe tends to lift the wheel from the track, and the harder the brake-lever is applied the greater becomes the upward pressure on the wheel. This upward pressure takes a corresponding amount from the pressure of the wheel on the rail, and it decreases said pressure of the wheel on the rail to such an extent as to prevent the burning of the wheel when it skids on the rail.

Fig. 1 illustrates one mode of applying my brake, wherein N N′ indicate the usual hand-wheel and brake-rod at each end of a car. n is a chain connecting hand-wheel and rod N with an arm n' of a lever N^2, which arm n' is again connected with a trace-bar P, adapted to slide in horizontal slots in hangers P′, and to each end of trace-bar P are attached traces P^2, each of which extends to and around the sheave in the upper end of one of each pair of lever-bars and to the end of a rod g^6, pivoted in the eye h^2 of the companion lever-bar, to which rod g^6 the trace is secured. The other hand-wheel and rod N′ are connected with the end of a lever R by a chain r, which lever R is connected with the arm n^2 of lever N^2.

I do not restrict myself to the details of construction herein shown and described, as it is obvious that many alterations may be made therein without departing from the principle and scope of my invention.

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

1. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever fulcrumed on the rail brake-shoe through a pivot, and an operating connection between the brake-lever and the wheel brake-shoe.

2. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever fulcrumed on the rail brake-shoe through a pivot, and a connection between the rail brake-shoe and the wheel brake-shoe, whereby the application of the rail brake-shoe to the rail applies the wheel brake-shoe to the wheel.

3. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever fulcrumed on the rail brake-shoe through a pivot, an operating connection between the brake-lever and the wheel brake-shoe, and a device adapted to prevent movement of the rail brake-shoe from or toward the wheel.

4. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever fulcrumed on the rail brake-shoe through a pivot, a connection between the rail brake-shoe and the wheel brake-shoe, whereby the application of the rail brake-shoe to the rail applies the wheel brake-shoe to the wheel, and a device adapted to prevent movement of the rail brake-shoe from or toward the wheel.

5. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever connected through a pivot with the rail brake-shoe, and an arm on said lever and connected through a pivot with the wheel brake-shoe.

6. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a bent brake-lever connected through a pivot with the rail brake-shoe, and an arm on said lever and connected through a pivot with the wheel brake-shoe.

7. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a bent brake-lever having an upwardly-extending member to which power is applied, a connection, through a pivot, between the other member of the brake-lever and the rail brake-shoe, and a connection, through a pivot, between the wheel brake-shoe and the outer end of said other member of the brake-lever.

8. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a bent brake-lever having an upwardly-extending member to which power is applied, a connection, through a pivot, between the other member of the brake-lever and the rail brake-shoe, a connection, through a pivot, between the wheel brake-shoe and the outer end of said other member of the brake-lever, and a device adapted to prevent movement of the rail brake-shoe from or toward the wheel.

9. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe having an adjustable connection with its support, a device adapted to apply the rail brake-shoe to the rail, and a connection between the rail brake-shoe and the wheel brake-shoe and pivotally attached to both said shoes, whereby the application of the rail brake-shoe to the rail applies the wheel brake-shoe to the wheel.

10. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe having an automatically-adjustable connection with its support, a device adapted to apply the rail brake-shoe to the rail, and a connection between the rail brake-shoe and the wheel brake-shoe and pivotally attached to both said shoes, whereby the application of the rail brake-shoe to the rail applies the wheel brake-shoe to the wheel.

11. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe having an automatically-adjustable connection with its support, a brake-lever connected through a pivot with the rail brake-shoe and having an upwardly-extending power-arm, and another arm on said lever and connected through a pivot with the wheel brake-shoe.

12. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe having an automatically-adjustable connection with its support, a device adapted to apply the rail brake-shoe to the rail, and a toggle-joint connection between the rail brake-shoe and the wheel brake-shoe, whereby the application of the rail brake-shoe to the rail applies the wheel brake-shoe to the wheel.

13. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a device supporting the wheel brake-shoe and adjustable vertically and automatically, a brake-lever having an upwardly-extending arm and connected through a pivot with the rail brake-shoe, and a toggle-joint connection between the rail brake-shoe and the wheel brake-shoe.

14. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a device supporting the wheel brake-shoe and adjustable vertically and automatically, a bent brake-lever having an upwardly-extending arm and connected through a pivot with the rail brake-shoe, the lower arm of said brake-lever and connected through a pivot with the wheel brake-shoe, the wheel brake-shoe and the lower arm of the brake-lever being below a line between the axis of the car-wheel and the pivot connection between the said brake-lever and the rail brake-shoe.

15. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a device supporting the wheel brake-shoe and adjustable vertically and automatically, a bent brake-lever having an upwardly-extending arm and another arm, a connection through a pivot between said other arm and the rail brake-shoe, and a connection through a pivot between said other arm and the wheel brake-shoe, the pivot connection between the wheel brake-shoe and said other arm of the lever being below a line between the axis of the car-wheel and the pivot connection of said other arm with the said rail brake-shoe.

16. The combination, in a car-brake, of an arm supported by the car-truck, a wheel brake-block, a device supporting the wheel

brake-block and having a vertical slot therein and engaging said arm, a lug on the outer face of the wheel brake-block, a rail brake-block having jaws on the top thereof, a brake-lever having an upwardly-extending arm, another arm on the brake-lever and pivoted between the jaws on the rail brake-block, and a pivot connection between the end of said other arm and the lug on the outer face of the wheel brake-block, the pivot connection between the lug of the wheel brake-block and said other lever-arm being below a line between the axis of the car-wheel and the pivot connection of said other arm with the rail brake-block.

17. The combination, in a car-brake, of a wheel brake-shoe having a vertically-adjustable support, a rail brake-shoe, a bent brake-lever having an upwardly-extending arm and connected through a pivot with the rail brake-shoe, the other arm on said brake-lever and connected through a pivot with the wheel brake-shoe, and a brace acting horizontally to prevent outward displacement of the rail brake-shoe.

18. The combination, in a car-brake, of wheel brake-shoes adapted to engage the adjacent sides of two wheels on the same side of a truck, a rail brake-shoe adjacent to each wheel brake-shoe, a brake-lever having a connection through a pivot with each rail brake-shoe, an arm of each brake-lever connecting each rail brake-shoe with the adjacent wheel brake-shoe and connected through a pivot with the wheel brake-shoe, and a horizontal strut having a connection with the rail brake-shoes.

19. The combination, in a car-brake, of wheel brake-shoes adapted to engage the adjacent sides of two wheels on the same side of a truck, a rail brake-shoe adjacent to each wheel brake-shoe, a bent brake-lever having a connection through a pivot with each rail brake-shoe, an arm of each brake-lever connecting each rail brake-shoe with the adjacent wheel brake-shoe through a pivot, and a horizontally-disposed rigid turnbuckle having a connection with the rail brake-shoes.

20. The combination, in a car-brake, of standards supported on the truck and adjacent to contiguous wheels on the same side of the car, an outwardly-projecting arm on each standard, a wheel brake-block below each of said arms, a turnbuckle attached to each wheel brake-block, a device attached to the upper end of each of said turnbuckles and having a vertical slot therein, said slots engaging said arms on the standards, lugs on the outer faces of the wheel brake-blocks, rail brake-blocks located adjacent to the wheels, jaws on the rail brake-blocks, a brake-lever above each rail brake-block and having an arm extending upward, another arm on each brake-lever and pivoted between the jaws on the rail brake-blocks, a pivot connection between the end of each of said other arms and the lugs on the outer faces of the wheel brake-blocks, the pivot connection between each of said other arms and said lugs being below a line between the axis of the car-wheel and the pivot connection of said brake-lever with said rail brake-block, and a horizontally-disposed rigid turnbuckle connecting the contiguous ends of said rail brake-blocks, substantially as and for the purpose specified.

21. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever connected through a pivot with the rail brake-shoe, an arm on said brake-lever and connected through a pivot with the wheel brake-shoe, and a projection on said arm and located between said pivots and adapted to engage a shoulder on the shoe, to limit the downward movement of said arm of the brake-lever.

22. The combination, in a car-brake, of a rail brake-shoe, a wheel brake-shoe, a brake-lever connected through a pivot with the rail brake-shoe, an arm on said brake-lever and pivoted by a bolt to the wheel brake-shoe, and a projecting end of said bolt and adapted to engage a shoulder above the rail brake-shoe, to limit the downward movement of said arm of the brake-lever.

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WM. R. GERHART.