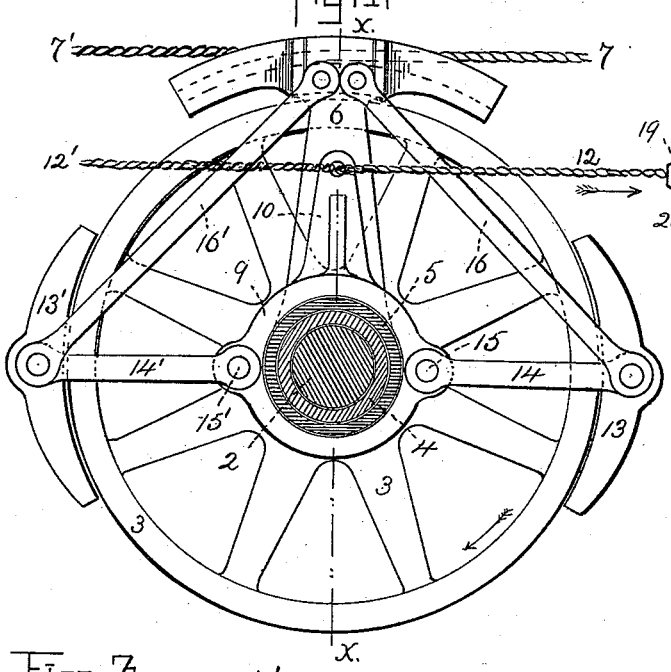
(No Model.)

N. LOMBARD.

CAR BRAKE.

No. 492,891. Patented Mar. 7, 1893.

Fig. 1.



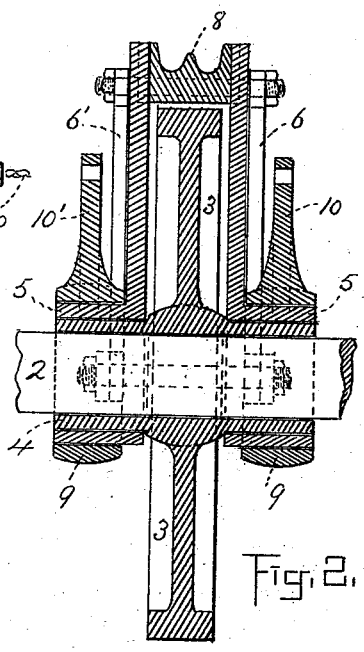


Fig. 2.

Fig. 3.

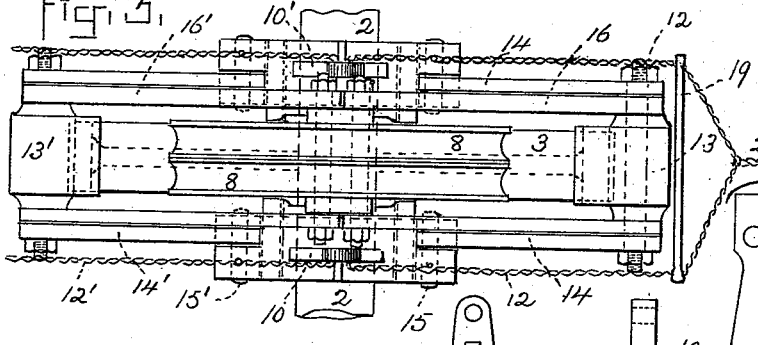


Fig. 6.

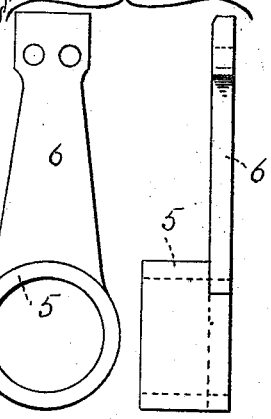
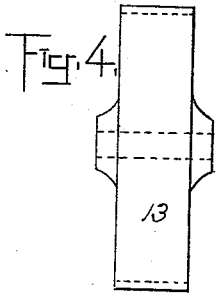


Fig. 4.



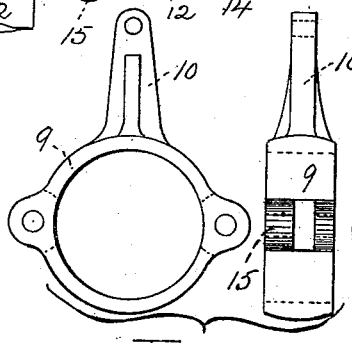


Fig. 5.

Witnesses.

Francis E. Stanwood

E. K. Boynton

Inventor.

Nathaniel Lombard.

by H. E. Lodge Atty.

UNITED STATES PATENT OFFICE.

NATHANIEL LOMBARD, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO HENRY A. CLARK, OF SAME PLACE.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 492,891, dated March 7, 1893.

Application filed January 3, 1893. Serial No. 456,988. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL LOMBARD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Car-Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of brake-mechanism, in which the momentum of the car to which it is attached serves to apply the brake.

This invention, as herein shown and described is intended especially for electric street-cars, and its purpose is to relieve the motor-man from all labor incidental to the setting of the brakes.

The mechanism embodying my invention is so arranged that a very slight movement of the brake-rod serves to check the car. This act is effected with little or no effort on the part of the motor-man, since I have so connected the several parts, that all the power required to set the brakes shall be derived from the momentum of the car itself.

Briefly stated my improvements consist in a rotary wheel or drum affixed upon the axle, a pair of friction-shoes or plates pivotally secured to a collar loosely upon the axle and adapted to grip the drum; said collar is operated by a lever-arm attached to the brake-rod chains. Further in an oscillating arm, also loosely upon the axle and surmounted with a segmental plate adapted to be united with the brake-lever, together with rods, which connect the friction shoes with the segmental plate in order that a pull conveyed to the chains may be transmitted to the brake-lever.

The drawings represent in Figure 1. a side elevation of brake mechanism embodying my invention. Fig. 2 is a vertical section on line *x x*. Fig. 3 is a plan of the same. Fig. 4 is an edge view of the friction-shoe. Fig. 5. shows side and edge views of the friction-shoe lever. Fig. 6 represents similar views of an arm carrying the segmental plate.

In the drawings 2 represents an axle to which brake mechanism embodying my invention is applied. Preferably in electric cars I employ that axle which is interconnected with the motor, since this part of the running gear always has the geatest momentum, and is the last to come to rest; hence the advantage of its application at this particular point is apparent. Positively attached to said axle is a wheel or disk 3 with a sleeve 4 upon the opposite ends of which are loosely mounted similar hubs 5 with projecting arms 6 6′; the latter are controlled by rods or chains 7 7′ connecting with the brake-levers, not shown, at opposite ends of the car. These chains are secured in a grooved segmental plate 8 which surmounts the arms, in order to bring the pull lengthwise of and in the direction of the chains themselves.

Furthermore loosely mounted upon the hubs 5 5′ are collars 9 9′ each furnished with a lever 10, 10′; these latter are respectively united with rods or chains 12, 12′ which extend to and are controlled by the brake-rods, not shown, at either end of the car, as usual. Since the levers 10, 10′ each have a connection or chain to the respective brake-rods, and in order to equalize their action upon the brake-rods, I have supplied a spreader or tie bar 19 which is united to a single chain or rod 20 leading to the brake-rods. In this way the effect of each lever is transmitted to the brake-beam (not shown) by means of the chains 7 7′.

Co-operating with the revoluble disk 3 are a pair of fricton-shoes 13, 13′, which are pivotally supported at the ends of two short rods 14, 14′ loosely secured at 15, 15′; such points being preferably diametrically positioned in the collar 9. By this arrangement it will be seen, that very slight rocking of either of the levers 10 10′ will serve to draw one of the friction shoes against the periphery of the disk 3, which is revolving under the influence of the momentum of the car. In order to transmit this effect or pull exerted by the friction shoe, when in contact with the disk, and occasioned by its tendency to revolve with the latter, I have supplied two connecting rods 16, 16′ which unite the pivots of the friction-shoes with the outer ex-

tremities of the arms 6, 6′. According to the degree of force, with which a friction-shoe is applied, so depends the amount of pull created by the momentum of the car upon the chains 7 7′.

The operation is as follows; assuming that the axle and disk are moving in the direction indicated by the arrow, should the brake-rod be operated, the chain 12, now the active one, is shortened with the result to rock the lever 10 in the direction of the pull of the chain. As a consequence the point 15 on the collar is lowered. But since it moves in the line of a tangent from the position in which it is now shown, the friction-shoe 13 is drawn against the revolving surface of the disk 3. When frictional contact occurs the shoe tends to rotate at the same speed as the disk, but this tendency is checked by the rod 16. Hence as the friction-shoes are pressed more or less tightly against the disk, so does the pull upon the chains 7. 7′ vary, such pull being transferred directly through the rods 16, 16′ to the arms 6. 6′, which are free to oscillate as occasion requires. In the instance above described and in the application of the friction-shoe 13, the effect is to transmit the strain or pull to the chain 7′ and operate the brake-lever, which is controlled by said chain. Conversely when the brake-rod united with the rod 12′ is operated the brake-levers 10 are oppositely actuated and tension is put upon the chain 7.

Among the advantages of this mechanism is the simplicity of the parts and their small number, only a very few pieces being required, and these can be attached to any car without alteration or change in the running gear, or in the construction or arrangement of the car-body. Furthermore a slight effort only on the part of the motor-man accompanied by a small movement of the brake-rod serves to produce a powerful leverage upon the brakes to set the latter.

What I claim is—

1. The combination with a revoluble axle, and a disk affixed upon the same, of non-revoluble levers independently operated by the brake-rods, friction shoes attached to said levers, rocking arms with chains to brake-levers, and positive means to unite the friction shoes with the rocking arms, substantially as specified.

2. In brake-mechanism, a revoluble axle, a sleeve disk rigid thereupon, and pivoted rocking shoes to co-operate with said disk, combined with a pair of rocking arms furnished with hubs loosely upon said sleeve, a pair of levers with collars loosely upon said hubs, rods which unite the friction shoes to said levers, and positive means to interconnect the shoes with the arms, as likewise means to join the arms with the brake-levers, substantially as explained.

3. In a car-brake the combination with a rocking lever, a pivoted rod attached to said lever, and frictional shoes at the extremity of said rod, of a revoluble axle, a disk affixed thereto, and an operating brake-rod connected with the lever, whereby rocking of the lever through the agency of the rod causes the friction shoe to bear against the disk, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

NATHANIEL LOMBARD.

Witnesses:
H. E. LODGE,
FRANCIS C. STANWOOD.