(No Model.) 2 Sheets—Sheet 1.

E. E. LA ROSE.

CAR BRAKE.

No. 550,627. Patented Dec. 3, 1895.

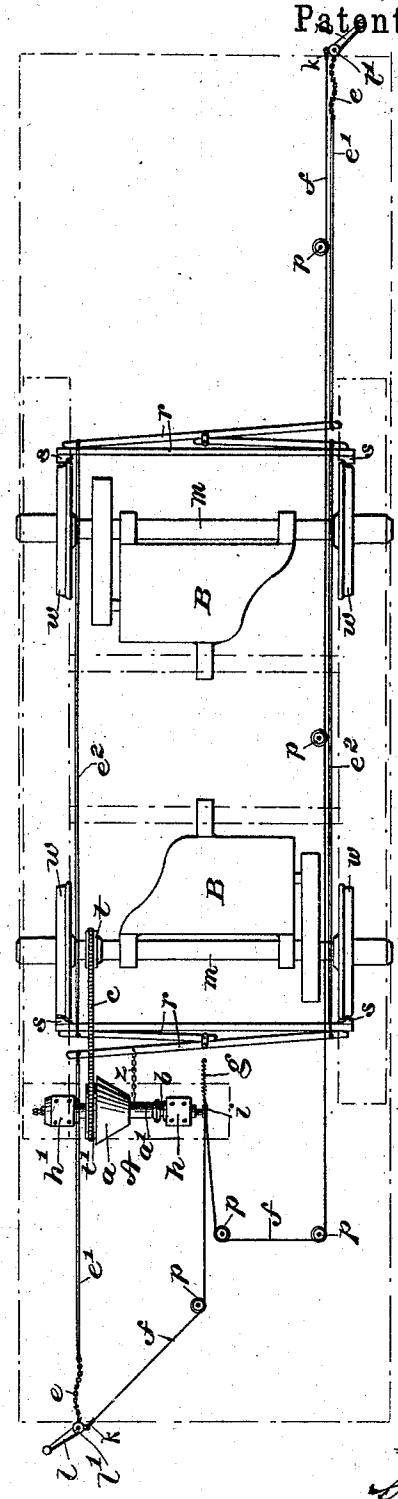

Fig. 1.

Witnesses.

Fred Arnold

W. M. King

Inventor.

Eugene E. La Rose.

by Remington & Hawthorn

Attys.

(No Model.) 2 Sheets—Sheet 2.

E. E. LA ROSE.

CAR BRAKE.

No. 550,627. Patented Dec. 3, 1895.

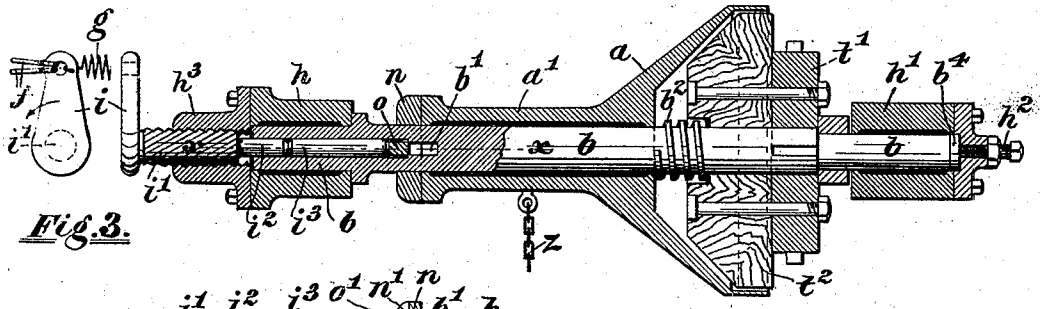

Fig. 3.

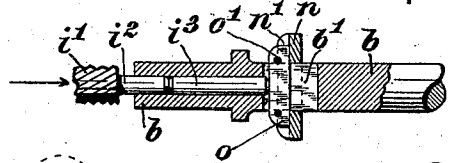

Fig. 4.

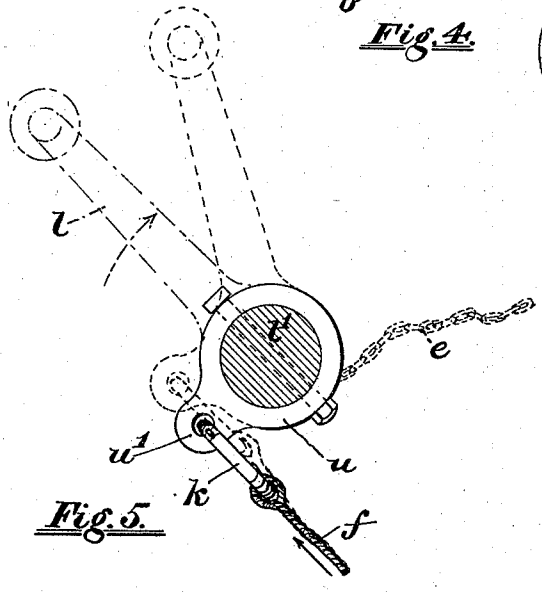

Fig. 5.

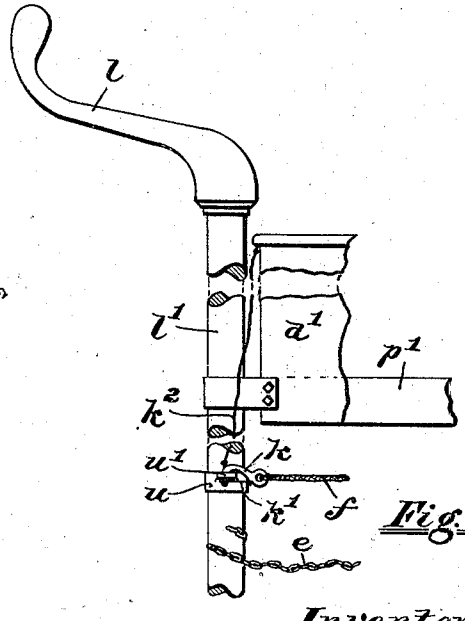

Fig. 6.

Fig. 2.

Witnesses.

Fred. Arnold.

W. M. King

Inventor.

Eugene E. La Rose.

by Remington & Henthorn

Attys.

UNITED STATES PATENT OFFICE.

EUGENE E. LA ROSE, OF PROVIDENCE, RHODE ISLAND.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 550,627, dated December 3, 1895.

Application filed March 27, 1895. Serial No. 543,352. (No model.)

To all whom it may concern:

Be it known that I, EUGENE E. LA ROSE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Railway-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 letters of reference marked thereon, which form a part of this specification.

My present invention relates to improvements in railway-car brakes, or rather to brake mechanism more particularly adapted for street-cars, the invention being of the class or type of braking devices in which the rotation of the car-axle is employed or utilized for actuating the brakes.

While, as just stated, braking mechanisms have been previously devised which operate through the force or power transmitted from the revolving car-axles, such former devices have been, so far as I am aware, impractical as well as lacking in efficiency, owing to the multiplication of parts, the amount of space required for their installation, and the necessarily increased cost.

The objects I have in view are to provide the ordinary street-cars with simple and comparatively inexpensive braking mechanism, the same being so constructed and arranged that it can be easily and quickly brought into or out of action, the device at the same time working with a degree of efficiency not heretofore attained. By means of my improved power-brake the brakeman, who in the case of electrically-propelled cars is also the motorman, is enabled to throw the brakes into or out of action by a minimum expenditure of force exerted through a short angular movement of the usual operating or brake lever. The device is operative from either end or platform of the car, or from both ends simultaneously, if desired, the same being effected without any change or adjustment whatever in the mechanism. In case of accident it can be instantly detached or disconnected, so that the ordinary hand braking mechanism with which the cars are usually provided is then brought into action, the brakeman at the same time using the operating or brake lever with great force to wind the brake-chain around the vertical rod or standard, as common, thus shortening the connections and forcing the brake-shoes into engagement with the periphery of the revolving car-wheels.

Another object of my invention is to provide the motorman with an improved form of braking mechanism which will act instantaneously, such a device being particularly desirable and essential in the case of quick-running street-cars. My improved brake is constructed and arranged so as to give the driver or motorman swift, sure, direct, or positive, as well as easy, control of his car. When thus equipped the cars can be run, if desired, at a high rate of speed with comparatively little risk or danger to pedestrians or teams crossing the track in advance of the moving car, since the motorman can apply the brakes instantly or within a fraction of a second, the whole acting simultaneously and bringing the car to a full stop within its length, or even a less distance, thereby to a great extent avoiding the need of fenders or guards for the cars.

In order to effect said objects, my invention consists, essentially, of a "cone" or "friction-clutch," so called, having one member thereof rigidly secured to a secondary shaft driven by and in unison with one of the car-axles, a clutch member loosely mounted on said shaft, a flexible connection uniting said loose clutch member with the usual brake connections, and means actuated from the operating or brake lever for forcing the loose clutch member endwise upon its shaft into frictional engagement with the said fixed clutch member, all as will be more fully hereinafter set forth and claimed.

In the accompanying two sheets of drawings, Figure 1, Sheet 1, is a plan view showing portions of the running-gear of an ordinary electrically-propelled street-car, and also showing my improved power-braking device combined with the usual braking mechanism. Fig. 2, Sheet 2, is a horizontal sectional view, enlarged, taken through the center of my improved mechanism. Fig. 3 is an end view of the clutch-engaging screw. Fig. 4 is a longitudinal central sectional view

taken substantially on line x x of Fig. 2. Fig 5 is a plan view, enlarged, of the standard connection, &c.; and Fig. 6 is a side elevation of the same in reduced scale.

I would state here that since my improvement is capable of being combined or connected with any well-known form of hand or manual power braking mechanisms for cars I have deemed it unnecessary to illustrate the latter, except in a general way, as shown in Fig. 1. In said figure the outline of the car and some of the sills or beams are indicated by the broken lines, some of the brake-supports being omitted.

In the drawings, w w designate the traction-wheels, secured to the revolving axles m and mounted in boxes, as usual. B B indicate suitable electric motors connected with said axles for propelling the car. A standard or vertical brake-spindle l' and its operating-lever l are mounted at each end of the car. Each spindle has a short chain e secured thereto, which in turn is connected with rods e', attached to brake beams or levers r, extending transversely of and below the car-base. The said levers r are arranged and adapted to actuate the brake-shoes s, all substantially as usual. The two sets of brake-levers, &c., are united by links e^2, whereby the act of winding the chain e around either of the spindles through the medium of the lever or working handle l causes all the brake-shoes to frictionally engage the several wheels w simultaneously, the force or power thus employed in braking the car being that exerted by the operator or motorman.

In a car provided with my improvement the power exerted by the operator in braking is practically *nil*, while at the same time the length of the arc or circular path described by the handle l is only from fifteen degrees to twenty-five degrees, whereas in brakes actuated by manual power one or more complete revolutions of the handle are usually required.

In carrying out my invention I employ a suitable sprocket or chain wheel t, which is rigidly secured to one of the car-axles m and, say, contiguous to a wheel w, as indicated in Fig. 1. Forward of and parallel with said axle is located a short shaft b, the same being mounted to revolve in hangers or bearings h h', secured to the under side of the car. To the said shaft b is secured a similar chain-wheel t', motion being imparted to the shaft by a suitable flexible driving connection or chain c, passing round both chain-wheels, as clearly shown in Fig. 1.

Referring now to Fig. 3, it will be seen that a disk t^2 of suitable material, as wood, is rigidly secured to the chain-wheel t'. This disk is beveled on one side or face and forms one member of a friction-clutch. The other clutch member a is made of metal and is movable endwise upon the shaft b. One end of the member a is shaped so as to frictionally engage with and form the counterpart of the beveled portion of the fixed fellow member t^2. When the clamping-surfaces of the clutch are separated, as when the device is in its normal or non-acting position, the car at the same time being in motion, the shaft b freely revolves within the member a, the latter being extended to form a bearing a' therefor. A spring b^2, surrounding the shaft, is interposed between the adjacent faces of the clutch members and serves to keep them normally separated.

One end of the clutch-shaft b, the end nearest the fixed clutch member, is supported in a hanger or bearing h', a screw h^2 and interposed metal disk b^4 being employed to resist the endwise thrust of the device. The opposite end of said shaft is supported in a bearing h. To the outer end of this bearing is secured a flange or cap h^3, which is tapped centrally and forms a fixed nut for the endwise-movable coarse-threaded screw i'. The shaft is bored centrally. The inner end of the hole thus formed terminates in a slot or keyway b', extending transversely through the shaft. A thrust-collar n is loosely mounted upon the shaft and is adapted to frictionally engage the adjacent end of the hub a' of the member a. This collar has a groove or slot n' formed in its face, Fig. 4, in which is mounted a key o, the latter also passing through the keyway b' of the shaft, as clearly shown. The inner end portion i^3 of the screw i' is reduced in diameter and extends into the bored end of the shaft and is adapted to engage the outer end of a movable short steel plug i^3 in contact with said key o. It is obvious, now, that upon turning the screw i' in the proper direction the spring-resisted clutch member a will be forced endwise into frictional engagement with the revolving fixed clutch member.

I prefer to connect the clutch member a to one of the members or levers r of the usual hand-braking mechanism through the medium of a short chain or flexible connection z, the latter being firmly secured to both, the relation of the chain z to said parts being such that there is practically little or no slack chain when in the normal position, or as represented in Figs. 1 and 3. Such being the case, it is apparent that the rotation of the car-axle irrespective of its direction of revolution produces a corresponding movement of the friction-clutch, assuming the two parts thereof to be in frictional contact, thereby mechanically braking the car.

The operating-screw i' is provided with a short arm i, to which is secured a wire rope or flexible connection f. The latter is suitably supported below the car and extends to the said usual brake-spindles l', mounted at the two ends of the car. Each end of the connection f is secured to a hook k, (shown in Figs. 5 and 6,) which in turn is removably secured to a short extension u' of the ring or member u, fixed to the spindle. A light spring or clip k' serves to prevent the hook from be-

ing accidentally detached from the member u. By means of a cord k^2, connected with the hook, the operator can easily and quickly disconnect the connection f from the spindle when desired. A spring g, secured to the screw-arm i, is employed for retracting the screw connection f, &c., to the normal position.

It is to be observed that when the usual manual or hand power brake is employed considerable time is lost in taking up all the slackness of the several connections, since the action of the brake is wholly independent of the speed of the traveling car, while at the same time the entire power transmitted to the brake-shoes is only that imparted to the brake-spindle lever or handle l. When my improved braking device is used, assuming the several parts thereof to have been properly adjusted and that the connections f are attached to the brake-spindles l', as before described, the operator can throw the clutch into action almost instantaneously with a minimum amount of force applied to the braking-lever l, since the latter need be vibrated but a short angular distance. It is obvious, too, that with my improved brake the faster the axles revolve the quicker will be the brake action to rotate the clutch member a, and thus cause the brake-shoes to snugly engage the wheels w.

I would add that in any event the clutch member a is rotated but a partial revolution (usually much less than one-half of a turn) to effect a complete brake action, as in stopping the car. Such a limited rotary movement would, however, obviously produce a too sudden stoppage of the car if the two parts of the clutch were adapted to interlock to form a positive-action clutch. Therefore I employ a friction-clutch arranged whereby the surfaces thereof when in contact may slide upon each other at varying rates of speed.

While I have represented the shaft b as revolving in unison with the fixed clutch member t^2, it is obvious that the arrangement of parts may be reversed—that is to say, the revolving member t^2 may be loosely mounted upon the shaft, in which event the other member a would be rigidly secured to the shaft, the latter then being endwise movable in the bearings, as in throwing the clutch into and out of action, but non-rotatable, its extreme axial movement being practically much less than one-half a revolution, as before stated.

I would further state that I consider a "positive-action" clutch impractical when combined with car-braking mechanism, as it possesses too great rigidity, &c. With a friction-clutch, however, the braking can be effected gradually, yet quickly.

Another advantage is that the several connections are somewhat yielding, and until the car is brought to a full stop the cone or contact surfaces of the clutch slide upon each other, thereby not only relieving the mechanism from undue strains, but bringing the car to a stop with comparatively little, if any, discomfort to the passengers, since all sudden jars or shocks are avoided.

The clutch and its contiguous parts may be suitably housed to exclude dust, &c., although being readily accessible for inspection and repairs.

I claim as my invention—

1. In a railway car, a suitably mounted car-axle, track-wheels secured thereon, brake-shoes capable of being forced into frictional engagement with said wheels, levers and suitable connections substantially as usual arranged to be made operative by manual power, in combination with a cone-shaped friction-clutch having one member thereof positively driven by the said car-axle, a suitably mounted slidable member arranged to frictionally engage with said driven clutch-member, thus forming a power brake, connected with some suitable part of the said manual power braking mechanism, and means consisting of a suitably mounted quick-acting screw and its nut, and flexible connections uniting said screw with a suitable arm or lever capable of being actuated and controlled by the brakeman for forcing said slidable member into engagement with its fellow member, for the purpose hereinbefore set forth.

2. In a railway-car, the combination with the usual manual power braking mechanism, of a cone-shaped clutch-member driven by and in unison with the revolving car-axle, an endwise movable clutch-member forming the counterpart of said driven member, mechanism connected with the said movable member and with the operating-lever of said usual braking mechanism for throwing the movable member into yielding frictional engagement with the driven member, and a connection uniting the movable member with any suitable part of the manual braking members, substantially as described.

3. In a power-brake for street cars, the combination with a revoluble clutch member driven by and in unison with one of the car-axles, of an endwise slidable member attached to the usual manual power braking mechanism which actuates the brake-shoes, mechanism connected with said slidable member for forcing the latter into frictional engagement with the said revolving fellow member, the usual hand-actuated brake-spindle, as l', around which the brake-chain is wound when braking by hand or manual power, having a short arm or dog u' secured thereto, and a flexible connection f detachably secured to said dog and to the said slidable clutch-member mechanism, substantially as hereinbefore described.

4. In a power-braking device for street cars, a friction-clutch, consisting of two members, one of which is driven by the rotation of the car-axle the other member being slidable and connected with the usual brake-shoe levers, a rotatable shaft having said clutch-members mounted thereon, a spring-resisted screw for

forcing the said slidable member into frictional engagement with the other or driven member, a vertical brake-spindle controlled by the brakeman, and a connection, as *f*, uniting said screw and brake-spindle, all arranged and adapted for operation substantially as hereinbefore described and for the purpose set forth.

5. In a power-brake for street cars, a suitably mounted rotatable shaft *b*, and a friction-clutch member secured thereon driven by the car-axle, in combination with an endwise movable clutch-member *a* loosely mounted on said shaft and connected with the usual manual-power braking mechanism, a collar, as *n*, mounted on the shaft and in engagement with said member *a*, a fixed nut, a screw fitted to the nut and extending therethrough, arranged to coact with said collar, a vertical brake-spindle connected with the usual manual-power braking mechanism, and a flexible connection uniting said brake-spindle and screw, substantially as hereinbefore described.

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

EUGENE E. LA ROSE.

Witnesses:
GEO. H. REMINGTON,
FREDERIC ARNOLD.