

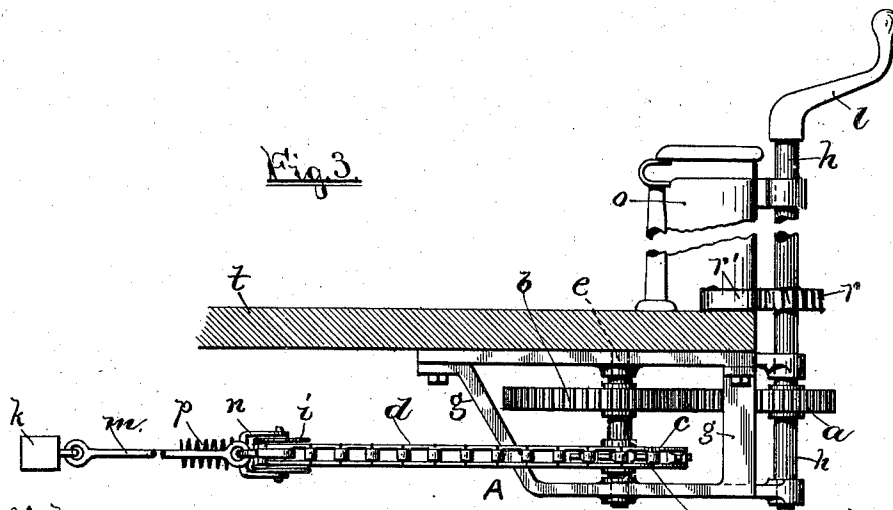
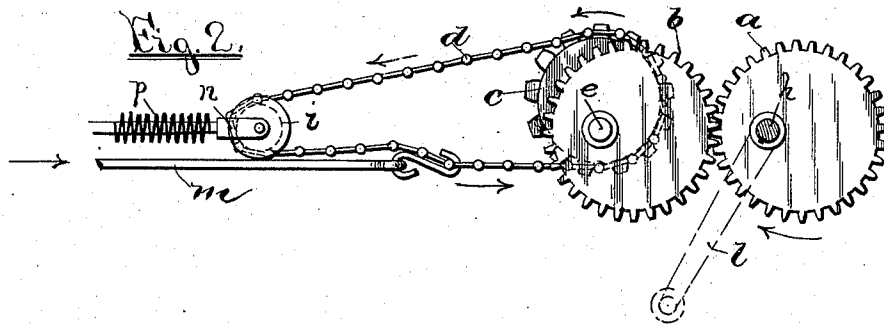
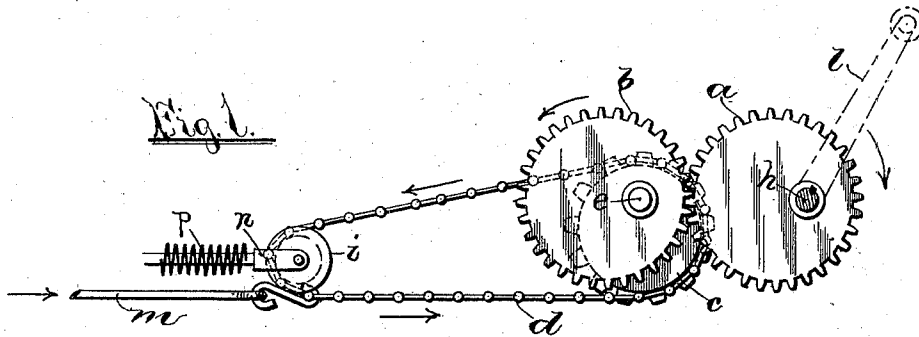
(No Model.)

2 Sheets—Sheet 1.

E. E. LA ROSE.
MECHANISM FOR OPERATING CAR BRAKES.

No. 558,588.

Patented Apr. 21, 1896.



Witnesses.

Willard A. Smith.
Remington Sherman

Inventor.

Eugene E. LaRose.
by Geo. H. Remington & Co.
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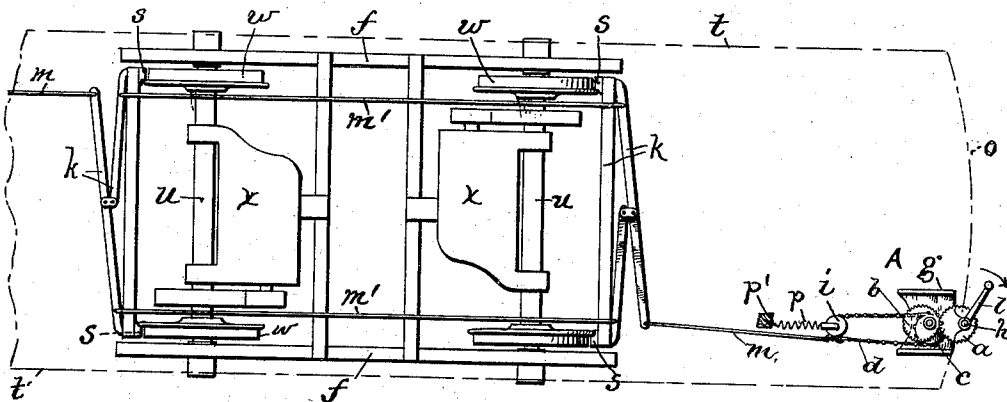


Fig. 4.

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UNITED STATES PATENT OFFICE.

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

MECHANISM FOR OPERATING CAR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 558,588, dated April 21, 1896.

Application filed February 3, 1896. Serial No. 577,778. (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 Mechanism for Operating 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.

In a patent of the United States. No. 550,627, granted to me December 3, 1895, I have described and claimed a power-brake adapted for street-cars. My present invention also has relation to the braking mechanism of street-cars, and more especially to the hand braking apparatus of electrically-propelled or trolley cars.

In street-cars provided with hand braking mechanism, constructed substantially as usual, the force or power applied to the brake-handle operates directly in winding the chain of the brake connection round the vertical spindle, the purchase or leverage being practically invariable; or, in other words, the leverage of the parts of the mechanism when taking up the slack of the connections is the same as when the brakeman is exerting greater force upon the brake-handle to set the brakes.

The object I have in view in my present invention is to provide street-cars with hand braking mechanism having greater power and efficiency than the braking devices just referred to. By means of my improvement the act of braking is effected with facility and with the expenditure of less manual power, the arrangement being such that greater speed or movement of the parts is attained during the major portion of the brake action, the speed gradually decreasing during the latter part of the brake movement—that is to say, the construction is such that the slack of the brake connections is quickly taken up, since a comparatively small force is required to effect it; but as the brake-shoes begin to

act the power or force exerted upon the brake-handle will be multiplied several fold.

I accomplish the results just named by a braking device consisting, essentially, of a pair of suitably-mounted intergearing eccentric or elliptical gears, one of which may be secured to the usual brake-spindle, an eccentric wheel or drum actuated by and in unison with said gears, a flexible connection positively driven by said wheel, and suitable brake connections coupled or linked to said flexible connection, all as will be more fully and concisely set forth and claimed.

In the accompanying two sheets of drawings, Figure 1 is a plan view showing my improved braking device in its normal position, as when the brake-shoes are free. Fig. 2 is a similar view showing the position and relation of the parts when the brake-shoes are set. Fig. 3 is a side elevation corresponding with Fig. 1, and Fig. 4 is a partial plan view, in reduced scale, showing my improved device adapted to the usual braking mechanism of a trolley-car truck.

While I have represented my improved braking device as applied to an electric or trolley car, it is obvious that it may be equally well adapted to be combined with the hand braking apparatus of other types of cars.

In Fig. 4, *t* indicates the outline of a part of the car-base; *f*, the truck-frame; *w*, the wheels mounted on axles *u*, as usual, and *s* the brake-shoes, the latter capable of being forced into frictional engagement with the wheel-faces. The brake-shoes *s* are mounted on or secured to a system of suitably-supported compound levers *k*, substantially as usual. A set of said levers *k* is located at the front side of each pair of wheels *w*, the same being united by links or connections *m'*, as common. Each of said systems of levers *k* is provided with a connection or pull-rod *m*, whereby any tension or pull upon the latter will cause the four brake-shoes to move simultaneously. I may further add that in ordinary hand braking devices a vertical brake-spindle is located at each end of the car-platform outside of the fender or dash, the lower end of the spindle having wound thereon a chain or flexible connection, one end of which is attached to the rod *m*. The

function and manner of operating a brake of this type is well known.

In the drawings, A indicates one form of my improved braking device as a whole. As drawn, it is combined with the usual brake-spindle *h* and pull-rod *m*, the latter being indirectly connected with the brake-shoes *s*, as before stated.

To the lower part of the spindle *h* is secured an eccentric gear *a*, which in turn meshes into a similar gear *b*, secured to a short vertical shaft *e*, both shafts *h e* being mounted in a suitable frame or housing, as *g*, secured to the under side of the car platform or base *t*. An eccentric sprocket-wheel *c* is secured to shaft *e*, round which wheel passes an endless chain or flexible connection *d*. The bight of the chain is supported by an idler or sheave *i*, mounted to revolve freely in a yoke *n*, the latter in turn being attached to a fixed member *p*, Fig. 4, through the medium of a spring or yielding connection *p*. By means of this latter device the chain *d* is kept comparatively taut at all times and irrespective of the position of the several eccentric members *a b c*. The forward end of the pull-rod *m* is hooked into or otherwise secured to the working side of the chain *d*.

It will be seen that the two eccentric gears *a b* are so set or adjusted with respect to each other and to the spindle *h*, when in the normal position, as shown in Fig. 1, that the minor radii are forward of the respective shafts' centers, the major radii being on the opposite side thereof. Therefore upon turning the handle or lever *l* in the arrow direction the longest radius of gear *a*, working on the shortest radius of gear *b*, will cause the latter to move at a correspondingly greater rate of angular speed than the former. Upon turning the said lever or operating-handle *l* ninety degrees from the normal or starting point the rate of movement of the two gears will then be alike; but upon continuing the movement ninety degrees farther, or to the extreme position shown in Fig. 2, the relative speeds will then be reversed, as compared with Fig. 1—that is, the gradually-decreasing radii of gear *a* in turning will produce or cause gear *b* to rotate at a correspondingly-reduced rate of speed. Thus it is seen that during the first half of the angular movement of handle *l* the slackness of the several connections (in case the chain *d* be wound direct on shaft *e* or concentrically with it) are quickly and easily taken up; but during the other half of the movement the leverage gradually increases, the speed of gear *b* becoming slower and slower. The corresponding maximum leverage is represented in Fig. 2.

In order to still further increase or multiply the leverage of the said gears *a b*, I secure an eccentric chain wheel or drum *c* to the gear-carrying shaft *e* in such manner that its minor radius is fixed, say, at substantially right angles to the said minor radius of gear

b. (See Fig. 1.) Now upon turning the handle *l* ahead ninety degrees from the said normal position the action of the wheel *c* will be to take up or advance the pull-rod much more quickly than would be due to the action of the gears *a b* alone, or even though the drum were concentric with the shaft *e*. By continuing the movement of handle *l* ninety degrees farther to its limit, or as shown in Fig. 2, the power or leverage of the wheel *c* gradually increases, owing to its correspondingly-decreasing radii with respect to the center of shaft *e*, the movement of chain *d* then being several times slower than when in the initial position shown in Fig. 1.

While I have shown only one form of my improved braking mechanism, it is obvious that other forms having different proportions embodying the device may be employed without departing from the spirit of the invention—for example, elliptical gears may be employed in lieu of eccentric gears, and a band or other flexible connection used in lieu of the chain *d*, the wheel or drum *c* being modified accordingly. By varying the proportions of the gears the maximum angular movement of the operating-handle *l* may be more or less than one hundred and eighty degrees, as desired. In any event I prefer to make the minor radius of wheel *c* as short as possible consistent with necessary strength.

The relation of the three eccentric members to one another may be varied under certain conditions; but however it may be modified I consider it essential that practically the first half of the action or stroke produces an increased speed of the pull-rod's movement, and the other half of the action an increasing multiple of the power applied at the handle, thereby resulting in a correspondingly-decreased movement of the pull-rod and a more powerful setting of the brake-shoes against the car-wheels.

I claim as my invention—

1. In hand braking mechanism for street-cars, the combination of a pair of revoluble non-concentric gears or members adapted to work in unison, an operating lever or handle through which said members are actuated, a revoluble eccentric drum or wheel controlled by the movements of said lever, and a connection mounted on said drum and coupled to the brake connections, arranged whereby the latter are moved at an increasing rate of speed during the first part of the brake action and at a decreasing rate of speed during the latter part of the brake action, substantially as described.

2. In hand braking mechanism for street-cars, a pair of eccentric gears meshing into each other, suitable brake connections actuated and controlled by said gears, whereby the initial action of the gears moves said connections faster than a normal rate and much slower than a normal rate during the final action, and having said gearing provided with auxiliary means for further increasing the

said fast rate of movement of the connections, substantially as hereinbefore described.

3. In a braking device for street-cars, the combination with a connection or pull-rod, suitably-mounted brake-shoes and intermediary members connecting said pull-rod and brake-shoes, of a pair of suitably-mounted eccentric gears meshing into each other capable of being operated by the brakeman, an eccentric member, as *c*, actuated by power applied to said gears, and a flexible connection actuated and controlled by said member *c* and connected with the pull-rod, arranged and adapted for operation substantially as hereinbefore described and for the purpose set forth.

4. In a braking device for street-cars, the combination of a pair of vertical shafts, an operating handle or lever, a pair of intergearing eccentric gears mounted on said shafts, an eccentric chain-wheel mounted on one of the

shafts and a suitably-supported chain mounted on said wheel and connected with a rod or other member, as *m*, through which power is transmitted to the brake-shoes, substantially as set forth.

5. In a braking device, the combination with an eccentric chain-wheel and compound or multiple gearing for rotating said wheel at varying rates of speed, of an endless chain passing round and capable of being actuated by said wheel, means for keeping the chain normally taut, and a pull-rod or connection, as *m*, through which the brake-shoes are operated secured to the driving side of the chain, substantially as hereinbefore set forth.

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

EUGENE E. LA ROSE.

Witnesses:

GEO. H. REMINGTON,
REMINGTON SHERMAN.