(No Model.)

2 Sheets—Sheet 1.

E. E. LA ROSE.

CAR BRAKE.

No. 561,328. Patented June 2, 1896.

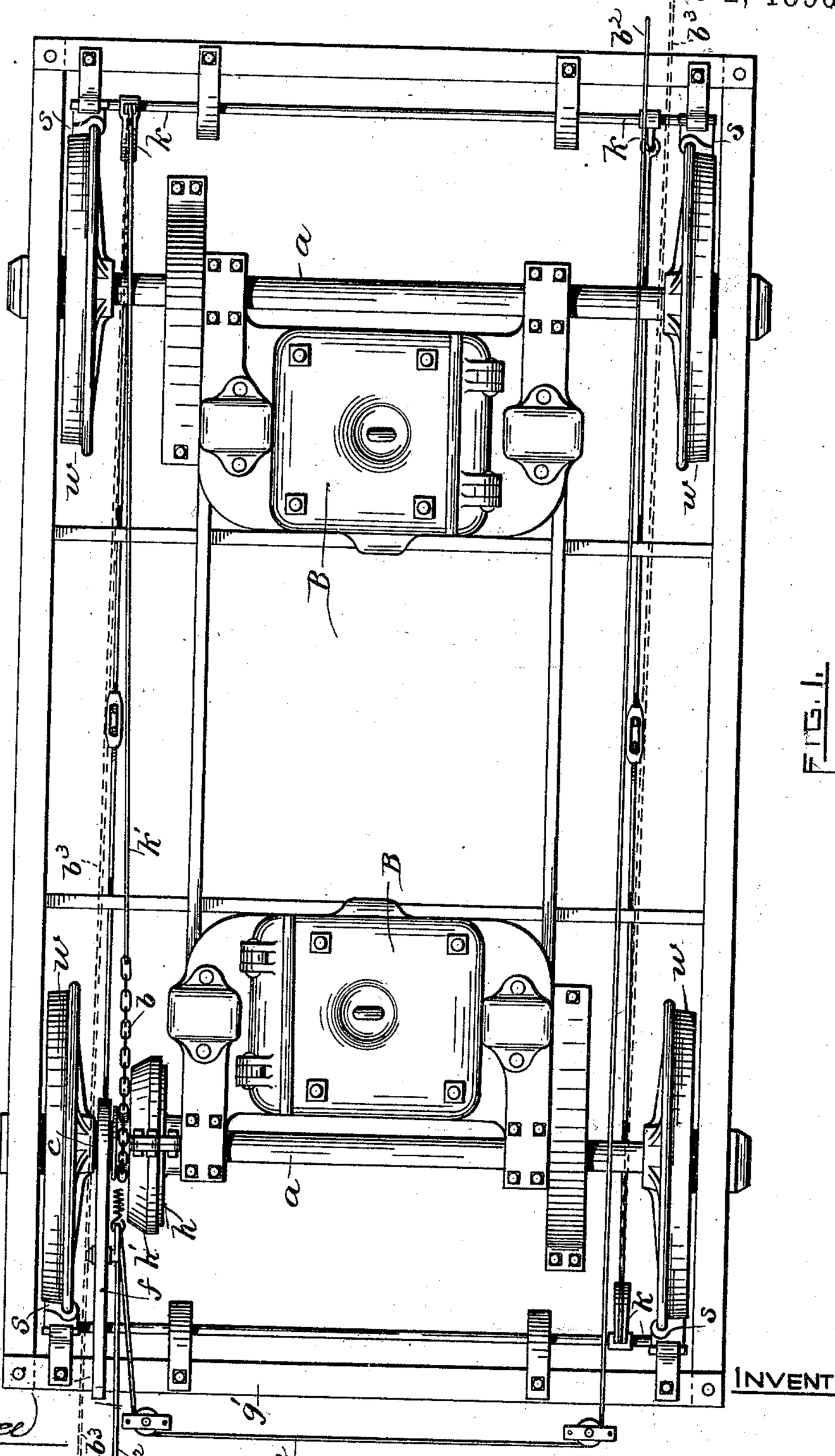
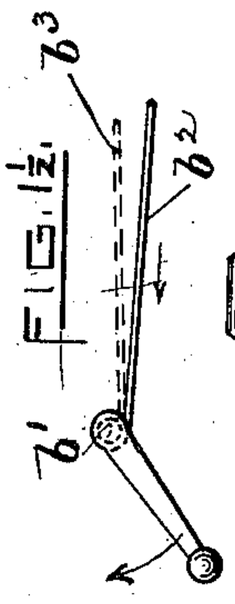


FIG. 1.

FIG. 1½.



WITNESSES.

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Charles T. Hannigan.

INVENTOR.

Eugene E. La Rose.

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Atty.

(No Model.) 2 Sheets—Sheet 2.

E. E. LA ROSE.

CAR BRAKE.

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FIG. 2.

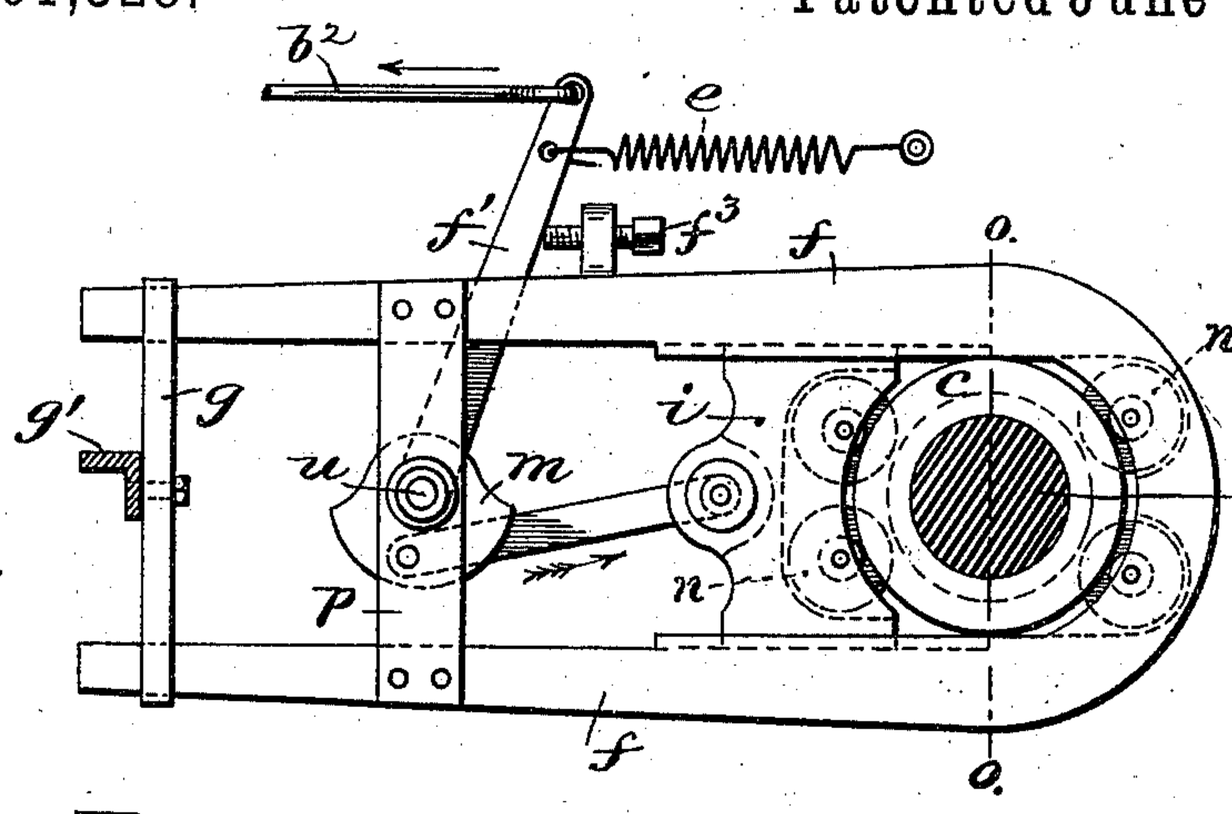


FIG. 5.

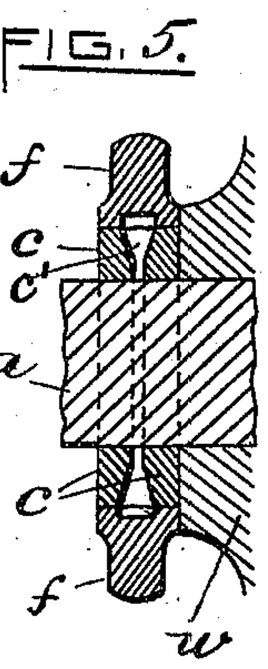


FIG. 4.

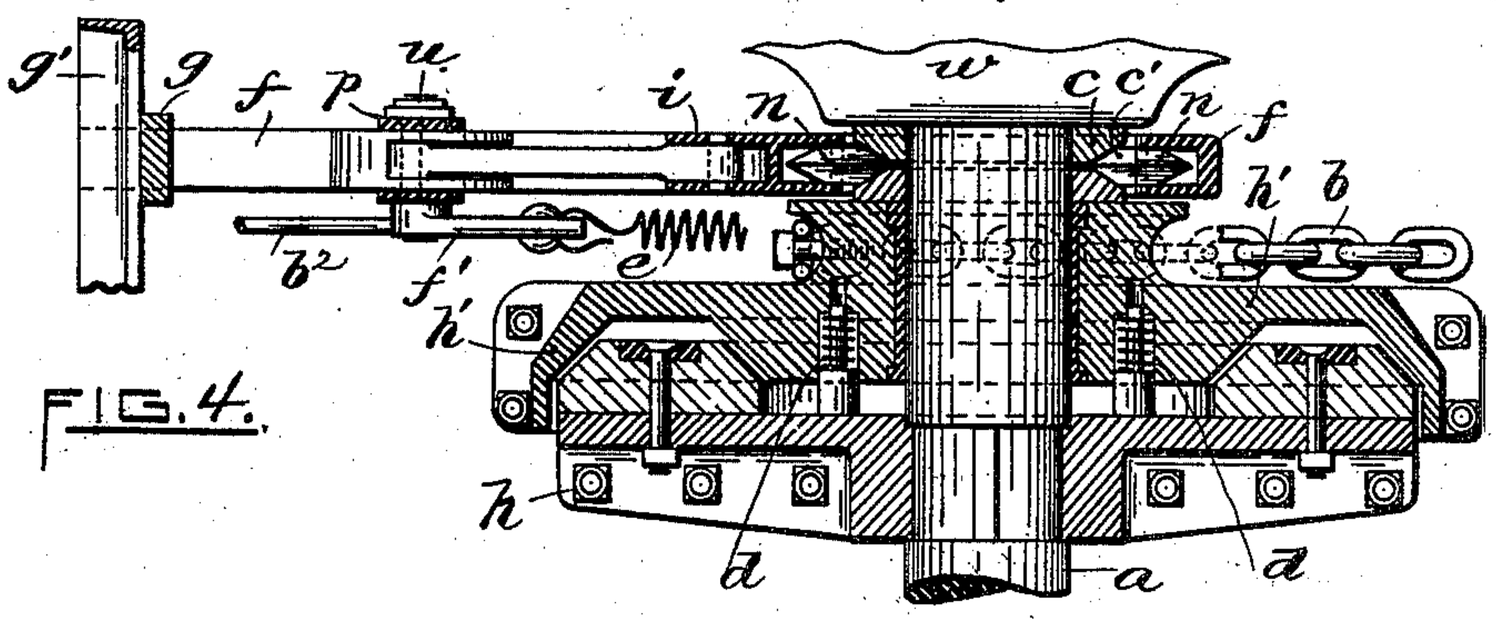


FIG. 7.

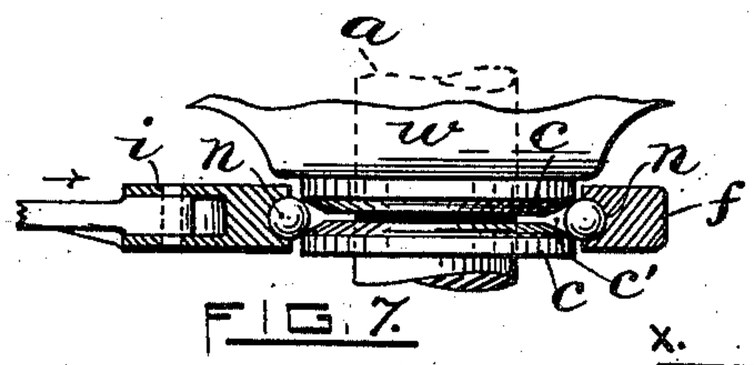


FIG. 6.

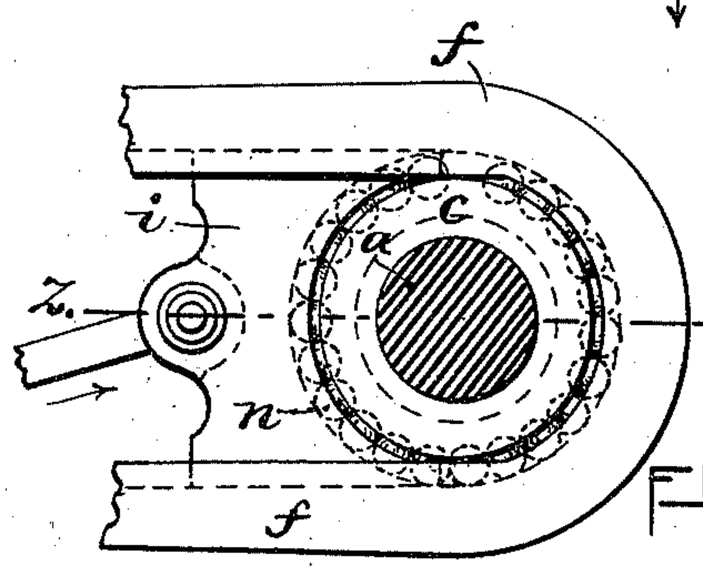
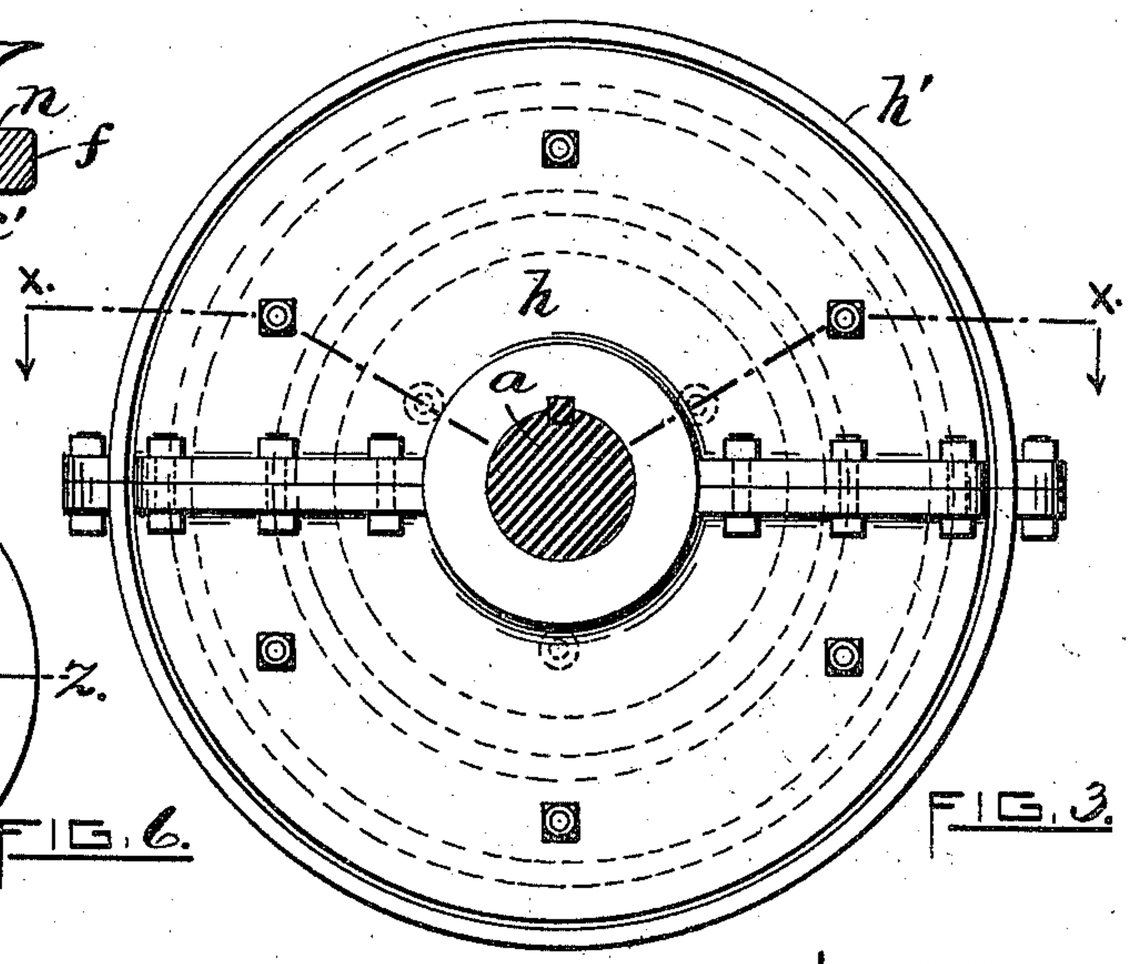


FIG. 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 561,328, dated June 2, 1896.

Application filed May 4, 1896. Serial No. 590,113. (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 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 invention relates to power-brakes for street-railway cars, and more particularly to electrically-propelled street-cars, said invention being an improvement on the car-brake patented to me by United States Patent No. 550,627, dated December 3, 1895. In said patented device a friction-clutch was employed, one member thereof being rotated by the movements of the car-axle. In my present device friction-clutch members are also used, one member being rigidly secured to the car-axle, the other being slidably mounted thereon and having a novel form and construction of clutch-shipping mechanism arranged whereby the clutch may be actuated quickly and readily, the working friction of the parts being reduced to a minimum, all as will be more fully hereinafter set forth and claimed.

My present braking mechanism is well adapted to be employed on electrically-propelled street-cars. In cars of this type the motors and gearing usually occupy nearly all the space between the adjacent faces of the hubs of the car-wheels mounted on the axles. In some cases a space of about seven inches only is available on the axle, said space being as a rule far too limited to receive suitable braking mechanism. I have devised an efficient and effective power-brake capable of being mounted on the axles of such electric cars and well adapted to be located in the restricted space just referred to. I may add here that my improved brake may be combined or connected with any well-known form of hand or manual power braking apparatus—that is to say, the clutch-shipper itself may be coupled or jointed to the usual pull-rod, which in turn is actuated by the vertical brake-spindle and the intermediate flexible connection or chain. One of the clutch members is connected with the usual or any well-known system of compound levers carrying the brake-shoes, said levers being so connected and arranged that all the brake-shoes are brought into frictional engagement with the wheel-faces simultaneously.

In the accompanying two sheets of drawings, Figure 1 is a plan view of a car-truck provided with motors and braking mechanism substantially as common and having my improved clutch-shipping device combined therewith. Fig. 1½ is a partial plan view forming practically a part of Fig. 1 and showing the brake-spindle through which the shipper is operated. Fig. 2 is a side elevation of the shipper mechanism. Fig. 3 is an end view of the clutch. Fig. 4 is a horizontal section, taken on line $x\,x$ of Fig. 3, showing the relation of the parts, the clutch members being disconnected or in the normal position. Fig. 5 is a transverse section taken on line $o\,o$ of Fig. 2. Fig. 6 is a partial side view showing the shipper-arm provided with a series of antifriction-balls, and Fig. 7 is a sectional view taken on line $z\,z$ of Fig. 6.

Again referring to the drawings, Fig. 1 represents portions of a base, truck, &c., of an electric car. The axles a thereof are mounted to revolve in boxes and are provided with wheels w and motors B, substantially as common. The brake-shoes s are connected with and actuated by a series or system of compound levers k, also as common.

To one of the axles a and between the adjacent faces of the hub of the motor and wheel w are located the fast and loose members $h\ h'$, respectively, of a friction or cone clutch. The said clutch members may be made in two parts or halves and bolted together, as shown in Figs. 3 and 4. The fast or male member h, as drawn, lies contiguous to the motor, the movable member h' being next to the wheel-hub. A pair of washers c are loosely mounted on the axle between the said wheel-hub and the sliding member h'. The adjacent faces of the washers at their peripheries are beveled, as at c', so as to form a substantially V-shaped space. To the hub of the clutch member h' is secured the end or ends of a

chain b, the other end being joined to a connection k', forming part of said system of brake-levers k, as clearly shown.

The two parts h h' of the clutch are kept normally apart by means of one or more springs d, substantially as shown, or in any other well-known manner. Thus it will be apparent that upon forcing the member h' endwise into frictional engagement with the revolving fellow member h the brake-shoes will thereby be brought into contact with the wheel-faces through the medium of the connections k k' and chain b, the latter at the same time being wound around the hub of the clutch member h' a corresponding extent. Upon releasing or withdrawing the power employed to force the clutch members together the expansive force of the compressed springs d operates to separate the clutch and thus simultaneously release the brake-shoes from the wheels w.

The means devised by me for effecting the frictional engagement of the clutch members consists of the endwise-movable suitably-supported shipper arm or yoke f, in which is mounted a slidable block i, and a crank or lever m connected with said block. The shipper-arm, as drawn, is grooved on its inner or concave side to receive a series of small antifriction rolls or balls n, the form of such rolls transversely being V-shaped and adapted to engage the correspondingly shaped or beveled sides c' of the said washers c. The side or edge of the sliding block i contiguous to the said concave side of the shipper-arm is also made concave and provided with antifriction-rolls. When the several parts are in place, the corresponding axle a will be central with respect to the said rolls, as clearly shown.

By means of the arrangement just described it will be seen that when the lever or crank m is moved inwardly or toward the axle with sufficient force the concave faces of the block i and shipper-arm f will be advanced toward each other, thus bringing the rolls into snug contact with the beveled sides of the washers c from opposite points, the action of the shipper being to forcibly separate the washers in a lateral direction; and since the outer washer is resisted by the hub of the fixed wheel w it follows that the shipper's movement will cause the other washer and corresponding clutch member h' to move along the axle, thereby clutching the parts h h' together, thus winding or shortening the chain b and setting the brakes, as before stated.

The shipper-arm is provided with a tie or brace p, in which the said crank m is fulcrumed, the latter consisting of a short shaft u and having an arm or lever f' secured thereto. The upper or free end of the said lever f' is attached to the usual vertical brake-spindle b' by a pull-rod or connection. In lieu of the latter a flexible connection b^2 may be employed, one end being secured to the brake-spindle. Now upon turning the usual operating lever or handle b^4, surmounting said spindle, (see Fig. $1\frac{1}{2}$,) in the proper direction it is obvious that the clutch members will thereby be brought into frictional engagement. Upon releasing or slackening the power applied to the brake-handle the shipper-arm and its block will automatically return to the normal position by means of a fixed spring e, having one end fast to the operating-lever f', as clearly shown in Fig. 2.

The shipper-arm is continuously supported by the normally stationary collars c, both while the clutch is in action and out of action. In order to effect this result, the sides of the arm are made comparatively wide or thick, as shown in Fig. 5. It will be seen that the two projecting parts or legs of the shipper are parallel to each other, the adjacent bearing-surfaces being separated a distance equal to the diameter of the collars c.

The free end of the shipper may be supported in a suitable bracket or guide g, firmly secured to one of the girders g' of the truck. (See Figs. 2 and 4.) In order to prevent the shipper-opening spring e from retracting the block i too far, the arm f is provided with an adjustable stop f^3. (See Fig. 2.)

From the fact that the clutch member h' and the collars c are practically stationary except when the clutch is in action I prefer to so construct and arrange the rolls n whereby they are in continuous yielding contact with the collars.

The car-braking mechanism illustrated herewith is readily controlled by the motorman by the expenditure of a comparatively small amount of pressure or force applied to the usual brake handle and spindle b', the degree of handle movement being much less in such event than in the case of cars unprovided with my improvement. If from any cause the power-brake should become temporarily inoperative, the connections or pull-rods b^3 (shown by dotted lines, Figs. 1 and $1\frac{1}{2}$ and coupled to the usual hand-braking mechanism) may be quickly brought into action by first simply detaching the said flexible or power-brake connection b^2 from the brake-spindle b', after which it may be operated in the usual manner.

It will be apparent that the braking mechanism (whether worked by power or by hand) is capable of being operated from either end of the car and also while the latter is moving in either direction by simply turning the crank-handle in the usual direction. (See arrow in Fig. $1\frac{1}{2}$.)

I am aware that shipper members of friction-clutches have been devised prior to my present invention in which the sliding part of a clutch has been effected by means of wedge-shaped members working in concert with the shipper. Therefore I do not claim such construction broadly. In all such former devices, however, a great part of the power transmitted thereto from the brake spindle or lever employed was expended in overcom-

ing the frictional resistance of the wedge itself.

I claim as new and desire to secure by United States Letters Patent—

1. The combination with a friction-clutch consisting of a fixed member and a movable member, as *h'*, of a shipper device provided with a series of antifriction rolls or balls arranged to coact with the said movable member in forcing the clutch members together, and means controlled by the brakeman for forcing the said antifriction members into action, substantially as hereinbefore described and for the purpose set forth.

2. The shipper device for power-clutches substantially as described, the same consisting of suitable collar members, as *c*, adapted to be mounted on the clutch shaft or axle, a shipper arm or yoke *f*, a block or cross-head *i* movable in said yoke, a series of antifriction members *n* mounted in the yoke and block, and means for forcing said members *n* into frictional engagement with the adjacent faces of said collars, for the purpose set forth.

3. In a power braking device for railway-cars, the combination with fast and loose clutch members mounted on the shaft or axle, and having one of said clutch members coupled to the brake connections, of a pair of suitably-mounted oppositely-beveled collars arranged on said axle contiguous to the other member of the clutch, a shipper capable of being expanded and contracted having a series of antifriction-rolls in engagement with the beveled faces of said collars, and means connected with the usual operating or brake lever and with said shipper, whereby the latter is forced into action for the purpose set forth.

4. In friction-clutch mechanism for power braking apparatus for street-railway cars, the combination of a pair of loose collars mounted on the axle contiguous to the clutch, and a movable shipper member supported by and in continuous engagement with said collars, 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,

REMINGTON SHERMAN.