(No Model.)

3 Sheets—Sheet 1.

A. DIEU.

CAR BRAKE.

No. 353,782. Patented Dec. 7, 1886.

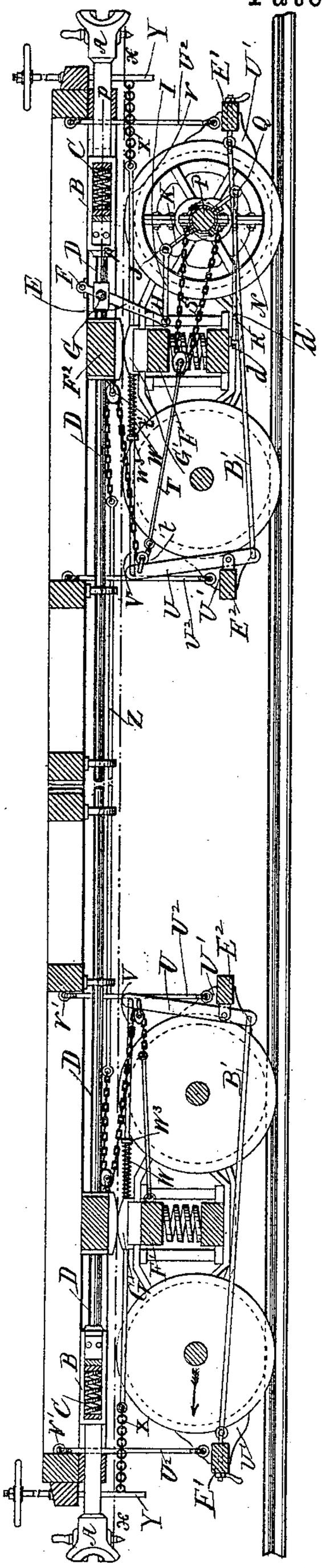

Fig. 1.

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(No Model.)

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Fig. 5.

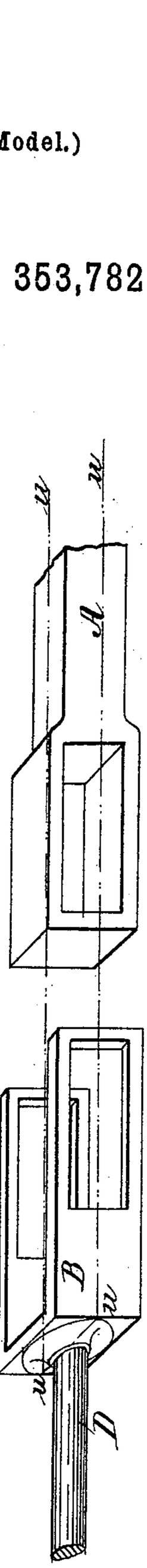

Fig. 4.

Fig. 2.

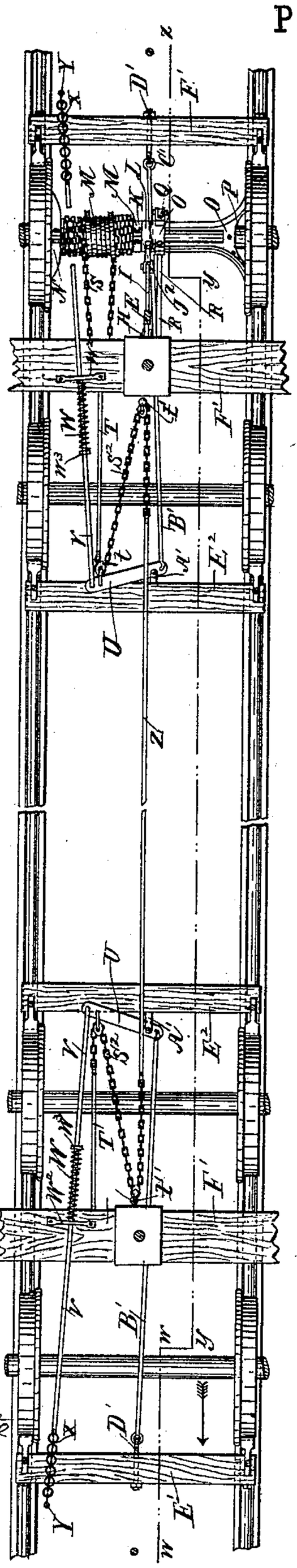

Fig. 3.

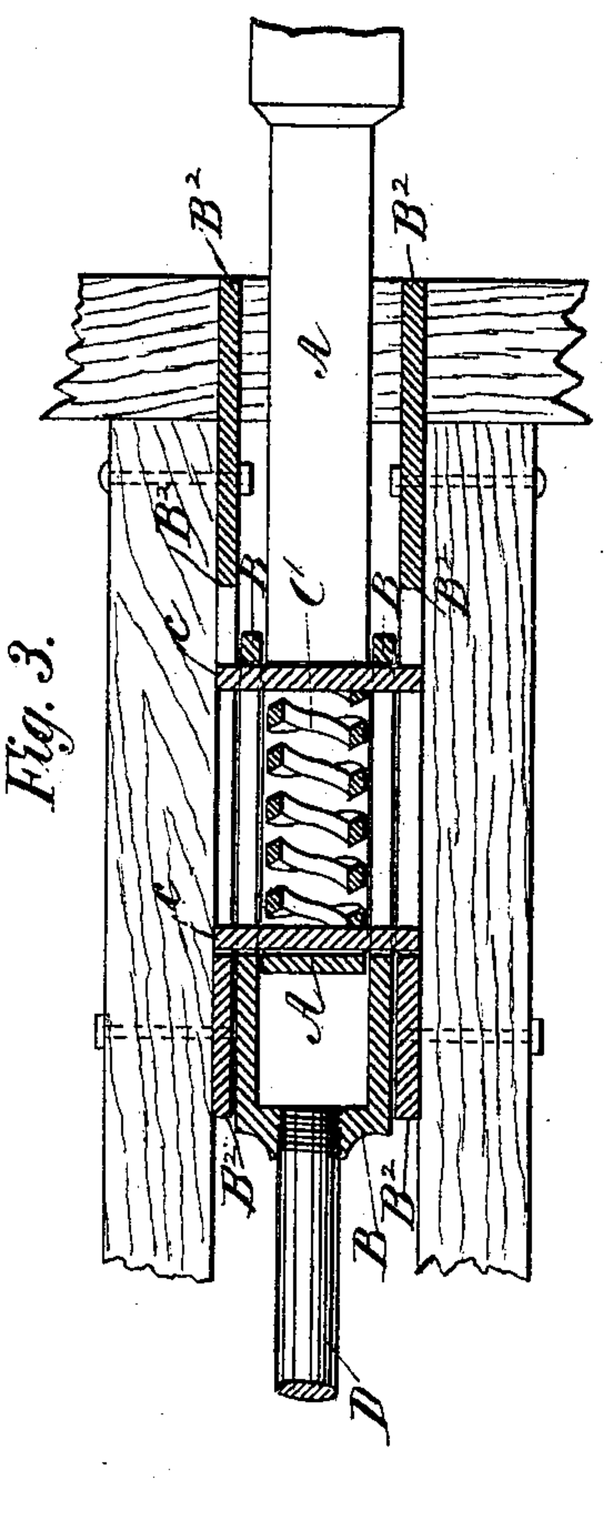

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Fig. 6.

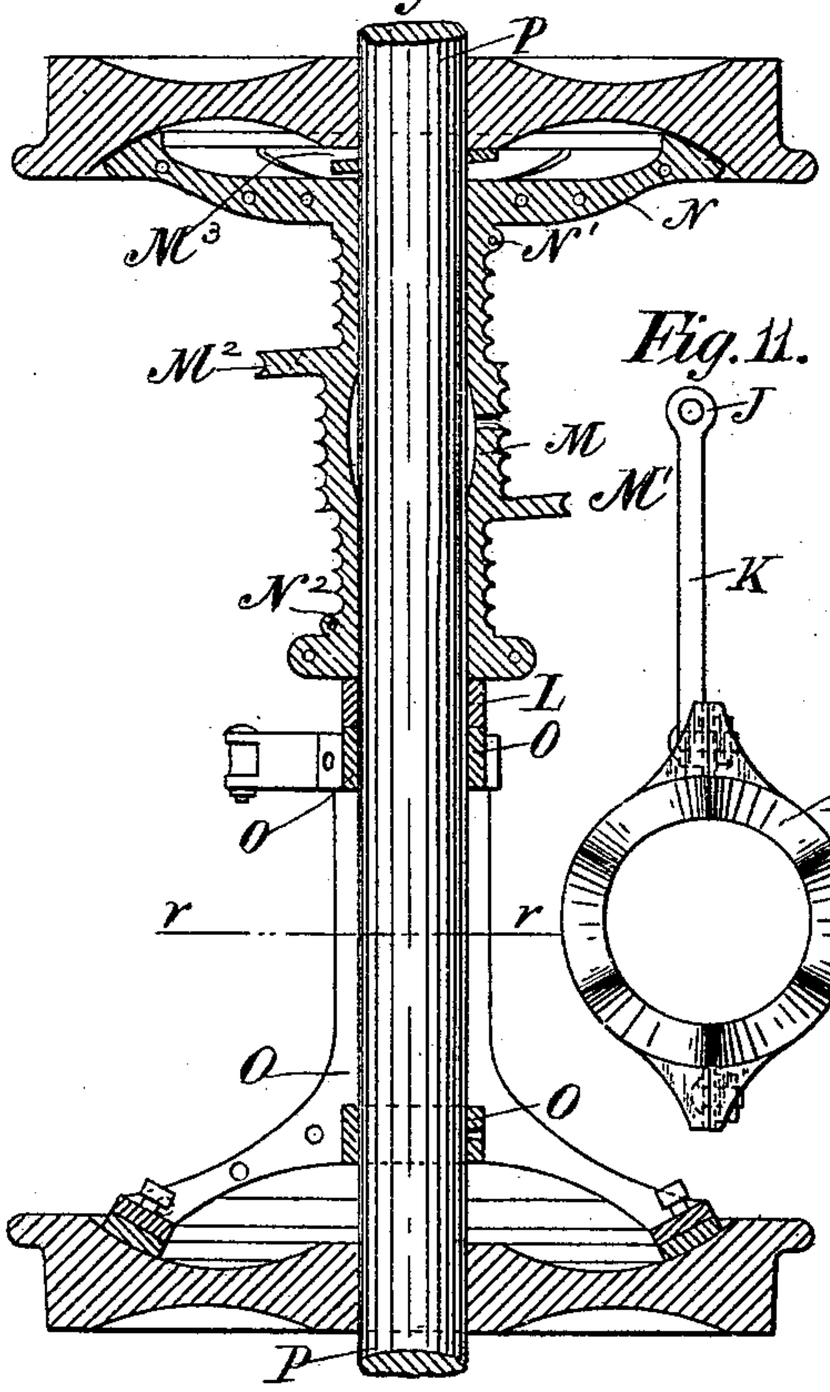


Fig. 11.

Fig. 8.

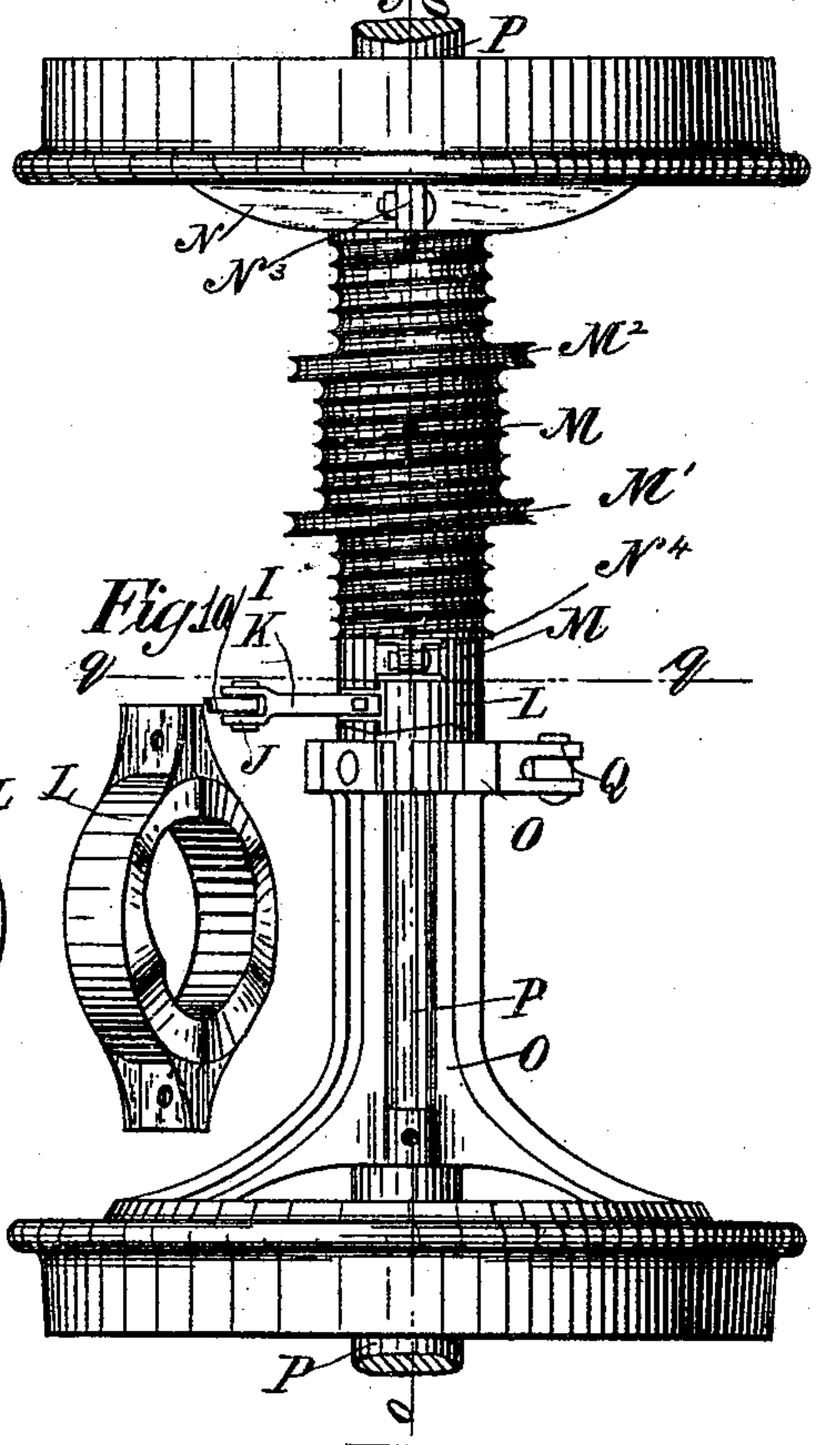


Fig. 10.

Fig. 7.

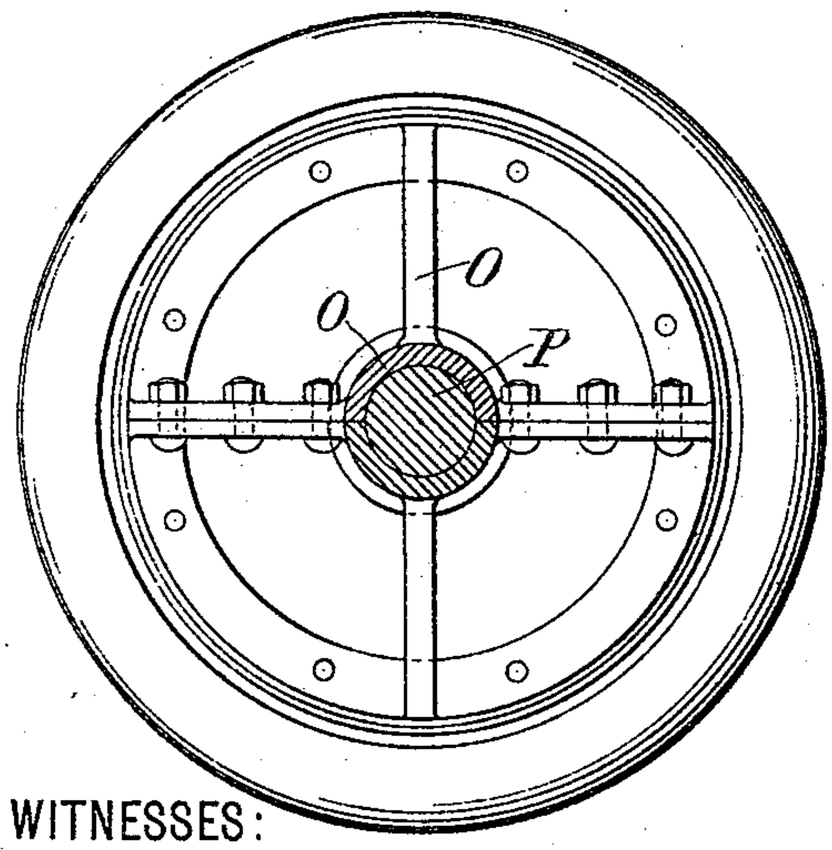
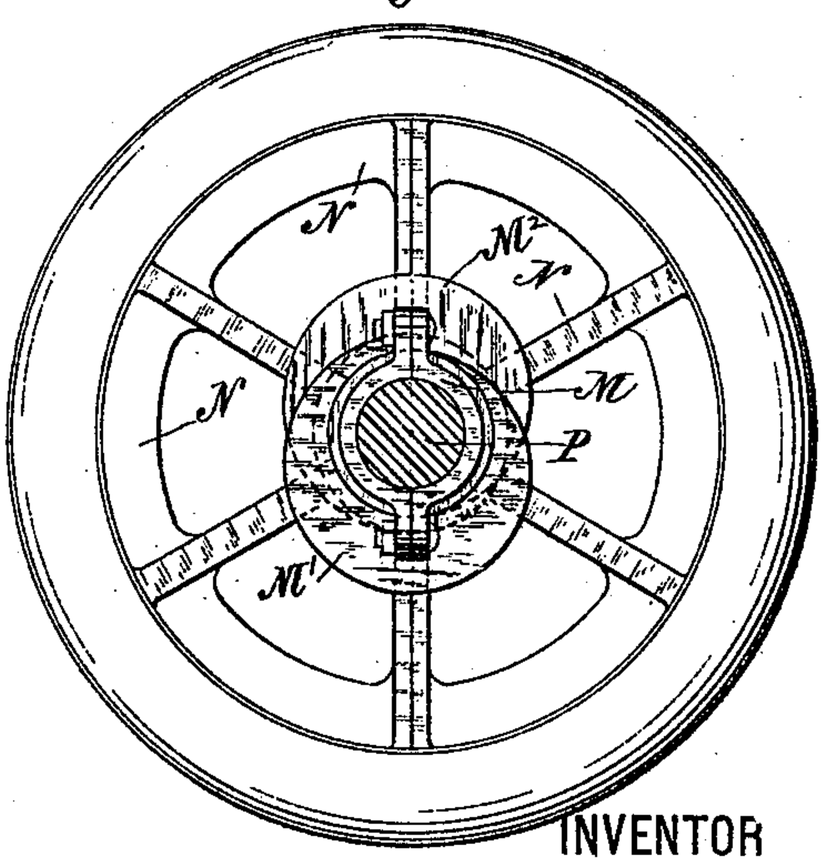


Fig. 9.



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UNITED STATES PATENT OFFICE.

ALEXANDER DIEU, OF NEW YORK, N. Y.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 353,782, dated December 7, 1886.

Application filed August 10, 1886. Serial No. 210,499. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER DIEU, a citizen of France, residing in the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Car-Brakes, of which the following is such a full, clear, concise, and exact description as will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide an automatic brake for railway-cars; and it consists in the construction and arrangement of parts, hereinafter more fully described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section taken in the plane *w w*, *y y*, and *z z* of Fig. 2, showing the two trucks and their brake mechanism, as well as the connections of the latter with the frame-work or body of the car, which is shown as being broken at equal distances from the ends. Fig. 2 is a horizontal section taken in the plane *x x* of Fig. 1, and at right angles to the section shown by Fig. 1. Fig. 2 presents a top view of the two trucks and their connecting brake mechanism. Fig. 3 is an enlarged horizontal or top view, partly in section, of the draw-bar A and of the forked piece B at the end of the rod or bar D, and showing also the buffer-spring C and the pieces B^2 B^2, connected with the car, the view thus presented in section being taken on the line *p p* of Fig. 1, the forked piece B and buffer A being cut in section at the point indicated by the line *u u* of Figs. 4 and 5, which latter figures are respectively enlarged perspective views of the forked piece B, secured to the end of the rod or bar D, as shown, and of the draw-bar A when disconnected from the same. Fig. 6 is a top view of the car-axle P, and, in connection therewith, a sectional view of the wheels and the parts L, M, and O of the brake mechanism, which are secured around the axle P, as hereinafter more fully described, the sectional view appearing in this figure being taken on the line *o o* of Fig. 8, which latter figure is a perspective view of the axle, the wheels, and the parts L, M, and O. Fig. 7 is an end view cut through the axle on line *r r* of Fig. 6, showing one of the wheels and the adjacent portion of the sleeve or part O which bears against the same, while Fig. 9 is an end view taken on line *q q*, Fig. 8, showing the opposite wheels and the differential crane or windlass M, which is secured to the axle and terminates in a circular rim made to bear against the wheel at that end of the axle. Fig. 10 is an enlarged perspective view of the collar L, which is interposed between the crane M and sleeve O on the car-axle P, showing the face thereof, which comes against the sleeve O; and Fig. 11 is a front view of the collar L, and showing also the arm K, by means of which the collar is actuated, as hereinafter described. In Figs. 1 and 2 the brakes are shown as being off, so that the brake-shoes do not bear against the periphery of the wheels.

Similar letters of reference indicate corresponding parts in all the figures.

A represents the buffer or draw-bar extending under the car-platform, and back under the end of the car until it meets the forked piece B, which is slotted so as to form a seat for the buffer-spring C. The play of the buffer takes place between the forks of the piece B, being limited by the spring C, which is keyed by the pieces *c c*, passing through the slots of the piece B and a slot in the end of the draw-bar, and extending into slots in the two pieces B^2 B^2, fixed to the car. The slots of the forked piece B do not extend back to the base of the fork, but there is an open space at this point which permits the end of the draw-bar to recede in the same; or the piece B may move toward the end of the draw-bar, each being free to move without the other for the distance permitted by the spring C. In addition to the movements permitted by the spring C, provision is also made by the slots in the pieces B^2 B^2 for a further movement of the bar D for a space of, say, three inches, being carried by the movement of the draw-bar at the opposite end of the car after the spring C at such end has been compressed sufficiently to exert a pressure upon this bar. The piece B is attached to a horizontal iron rod or bar, D, which extends beneath the car to a similar piece at the opposite end, the arrangement of the same with the draw-bar at that end being precisely the same. This rod D passes through several loops or eyes and is allowed free play within the same.

Near one end of the rod or bar D a lever, E,

is secured thereto by a bolt, G, which passes through the rod D and lever E, the lever being shown as passing through a slot in the rod and held at a fixed point by the bolt G. The end of the arm of the lever E, which extends above the rod D is fixed to the car by means of a small iron frame, F, or in any other suitable manner. The lower arm of the lever E connects at H with the extremity of a free lever, I, the opposite end of which is jointed or secured at J to the arm K of the collar L, which collar has a free run on one of the axles P. This collar L is made of two parts bolted together around the car-axle, and has one of its faces provided with projections or cam-surfaces alternately inclined, as shown in Figs. 10 and 11.

At the side of the collar L on which the cams or inclined surfaces are formed is a sleeve, O, which is made in parts bolted together, so as to secure it loosely around the axle. This sleeve O is provided at its inner extremity with inclines corresponding to those upon the adjacent face of the collar L, the two faces thus inclined being made to bear against each other. The sleeve O extends outwardly from the collar L, being provided a short distance therefrom with an arm, Q, and near its outer extremity it assumes the shape of radial arms or ribs, which are either cast or connect with a circular rim. (Shown in Figs. 6, 7, and 8.) This rim comes close to the inner side of the car-wheel, and when the sleeve is moved by the pressure of the cam-surfaces bearing upon similar surfaces on the collar L this rim is made to rub against the inside of the car-wheel. The movement of the sleeve O is limited by a rod, R, connected at one end to the arm Q, and having its opposite end pass through a loop or opening in an iron frame fixed beneath one of the cross-bars of the truck. The play of the rod R within this opening is fixed by key or lug *d*, outside of and another, *d'*, inside of the loop-opening in the iron frame at a point to be determined.

Opposite the sleeve O, and on the other side of the collar L, is a frictional pulley or windlass, M, made in parts secured together around the axle by bolts N^3 N^4, such windlass or pulley being provided with two differential cranes, M' M^2. The outer end of the windlass M is provided with radial arms which join a rim or ring, N, just inside of the wheel at that end of the axle. The windlass is held against the collar L by a spring, M^3, interposed between its arms and the wheel, and this spring prevents it being carried by the friction of the wheel, unless held against the same by the movement of the collar L. The spring M^3 also keeps the sleeve O in frictional contact with the car-wheel adjacent thereto, by reason of its pressure upon the windlass M, which moves against the collar L, which in turn presses against the sleeve.

A chain, S, having one of its ends secured at N' and the other at N^2, is wound around the windlass in such a way that it rolls up on one side while it unrolls on the other, and the pulley or windlass groove is such as to always produce a traction on the chain by reason of its passing over the differential cranes M' M^2, no matter what the run of the pulley may be. The chain S passes also over a pulley on the end of the rod T, and a chain, S^2, is secured to the opposite end of this rod T, which latter chain passes over a pulley, *t*, secured to the lever U, which lever is fulcrumed to the brake-beam E^2 by means of the piece A'. From the lever U, and attached thereto, a rod, T', extends to the brake-beam E', and is made fast to the same by a bolt, D'. One end of the lever U is attached to a rod, B', which extends to and is connected with the brake-beam E' by the bolt D'. A rod, V, also extends from the other end of the lever U, and has upon it a spring, W, which spring is secured at one end by a collar, W^3, around the rod V, and at its opposite end to a brace, W^2, secured to one of the cross-beams, F', of the truck. The rod V connects with a chain, X, which is secured to the spindle of a hand-brake, Y. The chain S^2, after passing over the pulley *t*, secured to the lever U, extends back and passes over another pulley, T', secured to a cross-beam, F^2, and thence the chain S^2 meets the rod Z, and is attached to the end thereof. The rod Z extends beneath the body of the car to a similar chain at the opposite end of the car, and operates a similar arrangement of levers connected with the brake-beams which act upon the wheels of the truck at that end of the car, as shown in Figs. 1 and 2.

The brake blocks or shoes U' are secured to the brake-beams E' and E^2 in the usual manner, such beams being suspended from the body of the car by means of rod U^2, or otherwise, as may be desired. The connection of the brake-beams and shoes and their movement against the periphery of the wheels are so well understood that detailed description thereof is unnecessary.

The direction of the motion of the car, as represented in the drawings, is shown by the arrow from the car-axle. The slackening of the locomotive, when its own brake is applied, naturally propels the car forward. The bar D is thus displaced relatively to its car and in the opposite direction to that of the train. The lever E being fixed at the point F, the bolt G, which passes through the bar D, will carry the lever E on its run. This movement is transmitted by means of the free lever I to the arm K of the collar L, and this collar will move around the axle, and being engaged with the cam-faces of the sleeve O, a separation is produced, and the sleeve O and windlass M move outwardly toward and against the inside of the wheels. The movement of the sleeve O will be limited by the rod R, and will be prevented from going backward, because the diameter of the rim of the sleeve O, which bears against the inside of the car-wheel, is calculated to have a friction on the car-wheel which is superior to the friction between the cam-surfaces thereof and those upon the collar L,

augmented by the force which acts upon the collar L and the car-wheel, will therefore carry the sleeve O in the direction it is going. The grooves on the differential cranes M′ M² allow the brake-blocks to be brought on the wheels by a single turn of the axle. This arrangement economizes several revolutions of the wheel and permits a lessening of the strength of the reaction-spring W.

The separation produced by the cam-surfaces on the sleeve O and collar L will produce a pressure of the friction pulley or windlass M on the other car-wheel, and the crane upon this windlass will advance the chain S, which operates the levers, as before described, thus bringing the brake-shoes against the wheels. As the speed of the locomotive increases the pressure of the windlass M against the wheel will decrease, because of the separation of the engine-buffer from the buffer of the car next behind, and the buffers of all the cars of the train separate and loosen their brakes in like manner. The force of the spring W, increased by the elasticity of the other parts composing the brake, will react on the chain S, and the frictional windlass will turn in a direction contrary to that of the wheels until there is equilibrium again. When the train begins to move forward, the cam-faces on the collar L and sleeve O will close again, and the spring M³ will throw the windlass back against the collar L, while the spring W will cause the brakes to assume their normal position. Now, assuming that a car which has been stopped begins to move in the opposite direction, the brake, instead of acting by the movement of the rod D, will remain motionless as to any action upon the wheels. The backward motion will begin to produce, as previously, a separation of the collar L and sleeve O, but the latter, by its pressure on the car-wheel, will be made to follow the movement of the wheel, and the direction of the motion of the collar L will be backward sufficiently far to meet the cam-surfaces on the sleeve O, so that there will be no separation or distance between them, and the friction-windlass will assume its position against the collar L, and be free from contact with the wheel, and consequently motionless, while the bar D will be brought back to its natural position with relation to the movement of the train, and will be ready for another movement or plunge to apply the brakes whenever the speed of the engine is slackened.

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

1. In brake mechanism, the frictional windlass M, provided with differential cranes M′ M², said windlass being secured around the car-axle, and made to carry a chain or its equivalent connecting with mechanism for operating the brakes, said windlass being adapted to take its motion from the car-wheel and to operate the brake mechanism, substantially as described.

2. In combination with brake mechanism having a frictional windlass, M, adapted to operate the same by taking its motion from the car-wheel, a spring interposed between said windlass and the adjacent car-wheel, whereby the said windlass is kept from contact with the wheel when the brakes are off, substantially as described.

3. The combination, with a car axle and brake mechanism, of the windlass M, secured around said axle, the sleeve O, also secured around the same, and the collar L, interposed between said windlass and sleeve, and connected with levers by means whereof it may be moved, said collar and sleeve being provided with corresponding cam-surfaces adjacent to each other, whereby the movement of said collar operates the said sleeve and windlass and their connecting mechanism, substantially as described.

4. In a car-brake mechanism, the combination of the sleeve O and windlass M, arranged as described, the collar L, interposed between said sleeve and windlass and being provided with an arm, K, the lever I, connected with said arm, lever E, connected at one of its ends to the lever I and having its opposite end fixed to the car, and the rod D, pivoted to said lever E and adapted to give motion to the same, thus causing the mechanism to operate, substantially as described.

5. In a car-brake, the combination of the windlass M, secured around the car-axle and provided with cranes M′ M², the chain S or its equivalent, rod T, lever U, connected with brake-beam E², chain S² or its equivalent, and rod Z, said chains being made to pass over pulleys connecting with said rods and with the lever U, and the whole being arranged as described, whereby the movement of the windlass M operates the brakes in the manner set forth.

6. In a combination with brake mechanism, the windlass M, collar L, and sleeve O, said collar and sleeve being provided with adjacent cam-surfaces for moving the said windlass and sleeve against the car-wheels, whereby they are carried by frictional contact with said car-wheels, the said sleeve O being provided with an arm, Q, said arm being connected with a rod, R, whereby the circular motion of said sleeve is limited, substantially as and for the purpose set forth.

7. In a car-brake, the combination, with the buffers of the car, of a rod, D, connected with levers adapted to give motion to the brake mechanism, said rod being provided with forked ends B B, and a spring, C, interposed within said forked ends and adapted to be acted upon by the same and by the buffer, whereby the movements of said rod and buffer are rendered independent of each other for the distance permitted by said spring, substantially as and for the purpose set forth.

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