(No Model.) 2 Sheets—Sheet 1.

R. F. BRIDEWELL.

BRAKE AND STARTER FOR STREET CARS.

No. 261,426. Patented July 18, 1882.

Fig. 1.

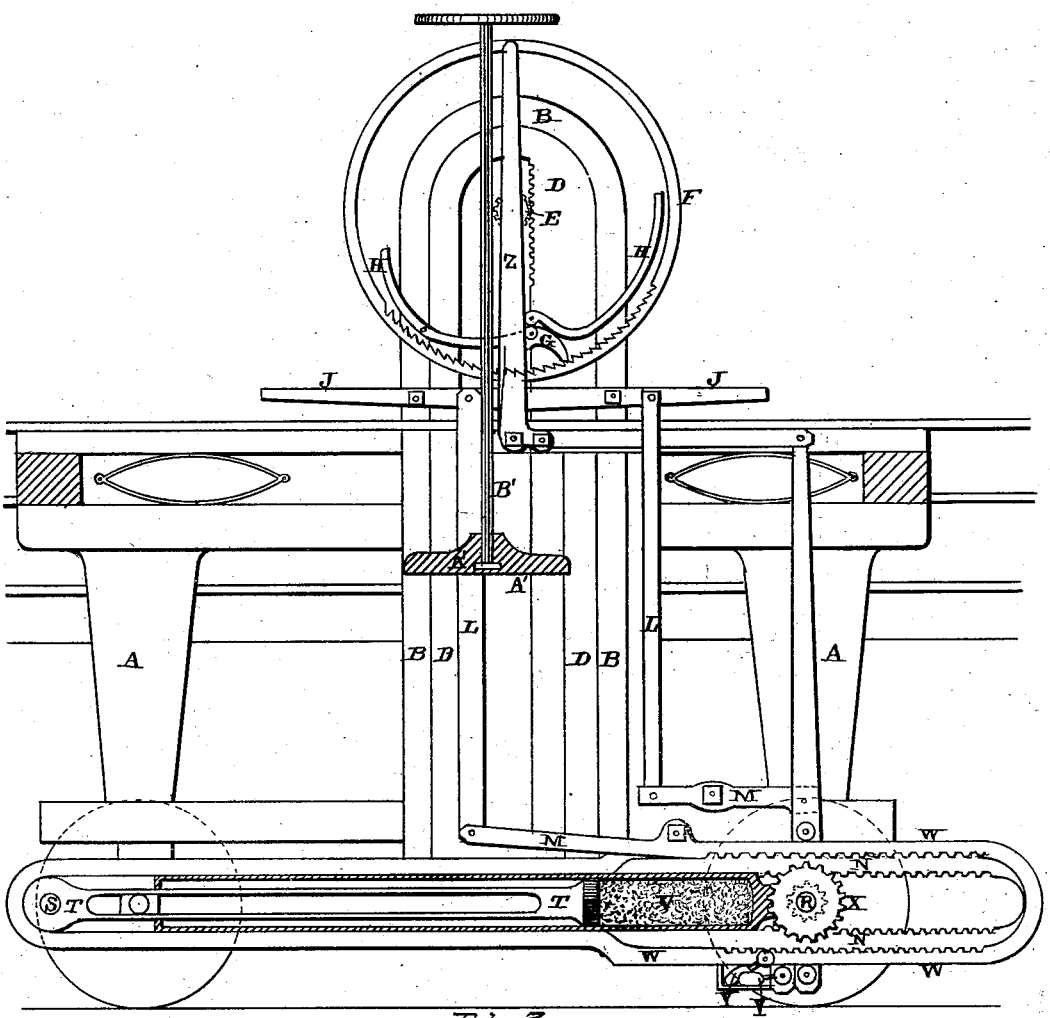
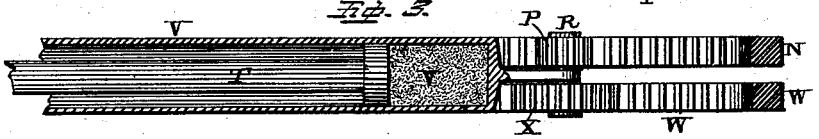


Fig. 2.



Witnesses.
J. Davis
W. W. Mortimer

Inventor.
R. F. Bridewell,
per
F. A. Lehmann,
Atty

(No Model.) 2 Sheets—Sheet 2.

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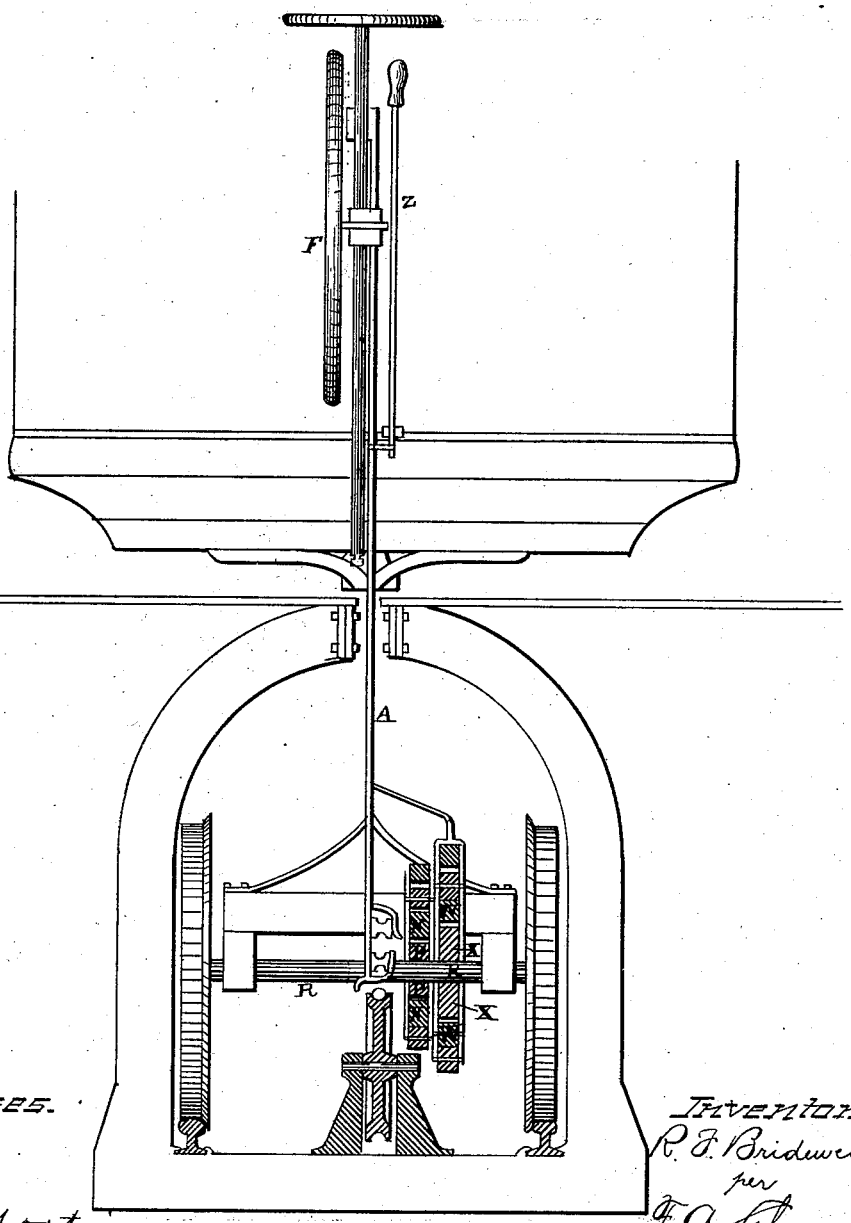
Fig. 2.



Witnesses.
Z. Davis
W. W. Mortimer.

Inventor
R. F. Bridwell
per
F. A. Lehmann,
Atty.

UNITED STATES PATENT OFFICE.

RICHARD F. BRIDEWELL, OF SAN FRANCISCO, CALIFORNIA.

BRAKE AND STARTER FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 261,426, dated July 18, 1882.

Application filed January 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, RICHARD F. BRIDEWELL, of San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Brakes for Street-Cars; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in brakes for traction street-cars; and it consists, first, in the combination of suitable operating-levers, two pivoted rack-bars, operating-wheels placed upon an axle, an air-cylinder, and a piston for condensing the air therein, whereby the momentum of the car in stopping is used to compress the air in the cylinder, and this compressed air is used in starting the car forward; second, in the combination of suitable operating-levers, two pivoted internally-toothed ratchet-bars, which are of different widths and which engage with wheels of different sizes upon the axle, one of which is used in compressing the air in the cylinder and the other in starting the car forward; third, in the arrangement and combination of parts, which will be more fully described hereinafter.

The object of my invention is to provide a means by which the momentum of the car in stopping is made to compress air in the cylinder, and this air in starting is made to assist the car, so that by the time the grip shall have taken a firm hold of the cable the car will be in motion, and thus a sudden jerk avoided.

Figure 1 is a longitudinal vertical section of my invention. Fig. 2 is a vertical cross-section of the same; Fig. 3, a detail view of the same.

The car or dummy will be of any construction which may be preferred, and be supported upon suitable standards, A, which pass down through a slot made through the top of the street into the road-bed beneath, and to the lower end of which standard are secured suitable supporting-wheels, as shown in Fig. 2. The car is to be drawn along by the traction rope or chain, which is supported upon suitable pulleys placed in the road-bed, and the car will be provided with a grip in the usual manner, for taking hold of this rope or chain for the purpose of drawing the car along. The general features of the grip have already been shown and described in a former application, and need not be more fully described here than in general terms.

The grip consists of an upper stationary jaw, which is connected with the outer stationary part of the frame B, and the lower movable jaw, which is connected with the movable part of the frame D, which moves vertically inside of the part B. This movable part of the frame is provided with teeth or cogs, which mesh with an operating-pinion, E, on the shaft of the large wheel F. By turning this large wheel F the movable part of the frame can be moved vertically for the purpose of closing the lower jaw upon the cable or for opening it for the purpose of stopping the car. Inside of the large wheel F are made suitable teeth, with which the dog G meshes, which dog is operated by the two hand-levers H, which are pivoted upon the frame B, for the purpose of allowing the wheel F to be freely turned. This dog serves to lock the wheel F in any desired position, and by locking the wheel prevent the vertically-moving part of the frame from dropping downward, and thus loosening the lower jaw of the grip upon the cable.

Also, pivoted upon the frame B are the two treadles J, both of which have a connecting-rod, L, attached to them for the purpose of operating the two pivoted levers M, which are secured in any suitable manner to the truck-frame. One of these treadles has its lever attached to it inside of its pivot and the other one outside, so that the levers M will always be made to operate in opposite directions. Both of these levers M are connected with the ratchet-bar N, which has teeth on its two opposite inner sides for the purpose of engaging with the pinion P on the axle R. This internal-toothed rack-bar extends horizontally along over the axle of the other wheels, and has its end connected by means of the pin or pivot S with the piston T, which is used for compressing air in the cylinder V. In stopping the car the large wheel F is operated for the purpose of disengaging the grip from the cable, and then either one of the treadles is operated, ac-

cording to the direction in which the car is moving. One of these treadles will bring the rack in the upper portion of the bar in contact with the pinion, and the other one will bring the teeth in the lower portion in gear with the pinion, and in either case the rack-bar will be moved along so as to force the piston into the cylinder and compress the air therein.

Also, connected to the piston by means of the pin or pivot S is a second larger rack-bar, W, which, while it is placed parallel with the smaller rack-bar, is separated some little distance from it, and is made to engage with a second wheel, X, upon the axle, which is just double the size of the pinion. These two rack-bars, being pivoted to the piston, always move together, and while the smaller rack-bar is used only in stopping the car the larger one, W, is used only in starting it. These two rack-bars are supported in a frame or stirrup, which is suspended from the truck-frame, and the two bars rest upon the weighted levers Y. When either one of these rack-bars is forced downward upon these weighted levers, which are provided with friction-rollers at their inner ends, the weighted ends of the levers are raised upward; but as soon as the force which moves the rack-bars is taken off the weighted levers cause the bars to rise upward just sufficiently far to throw the teeth of the bars out of gear with their respective wheels. Between the outer edges of the wheels and the inner edges of the teeth made in the rack-bars there is just sufficient space left so that the parts will not be brought into operation unless it is specially desired. When either one of the treadles is pressed downward the smaller rack-bar is thrown into gear with its pinion, and the rack-bar is drawn along, forcing the piston T into the cylinder V until the momentum of the car is overcome. The air is held confined in the cylinder V until the car is ready to start, when the lever Z is used according to the direction in which the car is to start, and this lever, through its connecting-rods, causes the large rack-bar, W, to be thrown into gear with the wheel X, and then, the foot being removed from the treadle A, the smaller rack-bar is thrown out of gear with its pinion, when the whole pressure of the condensed air will be exerted in forcing the piston outward, and this piston, in moving the two rack-bars, will be exerting just so much power in starting the car. Even if the compressed air is only sufficient to start the car in motion or to cause it to start much more easily, the sudden and unpleasant jerk which always takes place when the grip is fastened upon the cable and the car is suddenly started is avoided. The pressure of the condensed air, being exerted in starting the car, will cause the car to begin moving gently with the cable before the grip is clamped upon the cable. The two wheels upon the axle are made in the proportion to each other so that when the smaller rack-bar is thrown into gear with the pinion the car will not be stopped so suddenly, and the wheel X is made twice the size of the pinion, so that a much greater power will be exerted upon the axle in starting the car than there was in stopping it.

The piston-rod T is slotted so as to pass over the second axle of the car, and the cylinder is made just long enough to be supported between the two axles without binding against either one of them. When the air is being condensed in the cylinder the whole strain upon the cylinder is transferred to the axle, there being about one-quarter of an inch play between the ends of the cylinder and the two axles. This cylinder will be supported by means of suitable straps from the truck-frame, and has that end which bears against the axle to which the two spur-wheels are secured made thin, so as to catch over the axle in between the wheels. In order to regulate the descent of the car downhill, an iron brake, A′, is used, which is made to press against the top of the slotted rail by means of a screw-rod, B′. Where the car is going down hill the grip may be disconnected entirely from the cable, and then this shoe made to bear with any desired degree of force upon the top of the slotted rail in the top of the road-bed, and thus by frictional contact regulate the speed at which the car shall move down the hill.

Having thus described my invention, I claim—

1. The combination of the treadles, the connecting-rods, and the levers with the rack-bars, spur-wheels upon the axle, the air-cylinder and the piston, the rack-bars being connected to the piston, substantially as shown.

2. The combination of the treadles, the connecting-rods, and the levers for raising and lowering the smaller rack-bar, and the spur-wheels upon the axle with an operating-lever for throwing the rack-bar W in and out of gear with the wheel X, the air-cylinder, and piston, whereby one of the rack-bars is made to compress air in a cylinder by the momentum of the car when stopping and the other rack-bar is made to utilize this compressed air in starting the car, substantially as described.

3. The combination of the two rack-bars, a suitable supporting-stirrup, and the weighted levers upon which the rack-bars rest, whereby they are held in such a position when free to move that they will not engage with the wheels upon the axle, substantially as set forth.

4. The combination of the two rack-bars, pivoted together at one end to the piston T, an air-cylinder, V, the spur-wheels upon the axle, and suitable mechanisms for operating the rack-bars independently, substantially as specified.

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

RICHARD F. BRIDEWELL.

Witnesses:
JOHN WHITE,
JOHN E. HAMILL.