

J. L. KNOWLTON.

Car-Brakes.

No. 137,079.

Patented March 25, 1873.

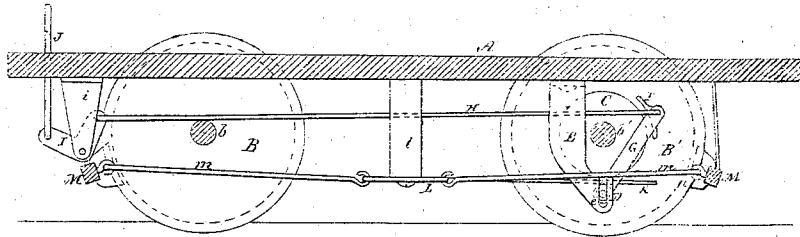


Fig. 1.

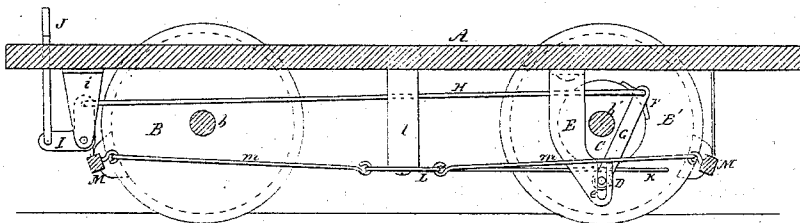


Fig. 2.

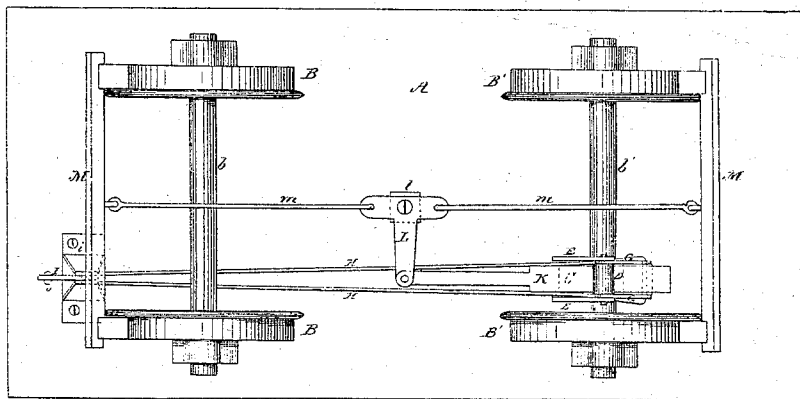


Fig. 3.

Witnesses,

C. A. Mariani  
Geo. Baker Jr.

Inventor,

John L. Knowlton.

# UNITED STATES PATENT OFFICE.

JOHN L. KNOWLTON, OF SHARON HILL, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM E. WALTON, OF SAME PLACE.

## IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. 137,079, dated March 25, 1873.

*To all whom it may concern:*

Be it known that I, JOHN L. KNOWLTON, of Sharon Hill, Delaware county and State of Pennsylvania, have invented a certain Improved Mode of Operating Car-Brakes, of which the following is a specification:

My invention consists in so arranging a friction-wheel on the car-axle, in connection with a pulley, rods, and levers, that the power derived from the rotation of the wheels, when the car is in motion, can be communicated at will to the brake-rods, causing the brakes to bear against the wheels, and thus stop the car.

Figure 1 is a longitudinal section, showing the position of the various parts when the brake is not applied. Fig. 2 is the same view with the brake on, and Fig. 3 is an inverted plan.

A is the floor of the car; B and B', the wheels; and *b b'* the axles, revolving in journals in the ordinary manner. On the axle *b'* is secured a friction-wheel, C; this wheel may be made of wood, or metal covered with leather, or of paper secured between two iron disks; the latter mode of construction I consider the best. D is a small metal pulley, which is allowed a vertical as well as a rotary motion, the axle sliding in the slot *e* of the bracket E, the bracket being securely attached to the bottom of the car. F is a metal shoe, the concave surface of which corresponds in shape to the periphery of the friction-wheel C; this shoe is connected to the small pulley D by means of the connecting-rods G, the lower ends of which form the bearings for the axle of said pulley. H is a double rod, one end of which is attached to the shoe F and connecting-rods G, and the other to one arm of the bell-crank lever I, suspended from the bottom of the car on the bracket *i*; to the other arm of this bell-crank lever is connected the foot-rod J. K is a flat bar, passing between the small pulley D and friction-wheel C, the end of which is jointed to the long arm of the double bell-crank lever L, which vibrates on the post *l* on the bottom of the car; each of the other arms of this double bell-crank lever is attached by means of the rods *m m* to the car-brakes M M, and if turned on its pivot in either direction will draw the brakes toward

each other, and consequently cause them to bear against the wheels.

The brakes are hung from the bottom of the car or from the trucks, in the usual manner.

When the car is in motion, and the several parts of my invention are in the position shown in Fig. 1, and it is desirable to apply the brakes, the foot-rod J is pressed down with the foot, and consequently (through the medium of the bell-crank lever I) draws the double rod H forward, and with it the shoe F, until the latter presses against the friction-wheel C. This wheel being secured to the axle *b'*, and therefore revolving with it, raises the connecting-rods G, and also the small pulley D, until the flat bar K is grasped firmly between the said small pulley and the friction-wheel C, and the flat surface of the bar being thus held against the friction-edge of the wheel C as it revolves the bar is drawn through between the rollers; this causes the double crank-lever L to turn on its pivot, and consequently, by means of the rods *m m*, applies the brakes M M to the wheels; the different parts then assume the position shown in Fig. 2.

As the shoe F, if not drawn tightly against the wheel C, will slip on its surface as the latter revolves, consequently the bar K will also slip, but will be drawn between the rollers with a power increasing or diminishing in proportion to the pressure on the foot-rod J.

This invention is particularly applicable to city passenger street-railway cars, as the driver can at all times have free use of his hands to govern his horses, and apply the brakes either suddenly or gradually, as the case may require, by means of his foot on the rod J.

I do not wish to confine myself to the use of the bar K, as the same end would be attained by dispensing with said bar, and in lieu thereof attaching a chain to the long arm of the double bell-crank lever L, the other end of said chain could wind on an extension of the axle of the small pulley D.

It is obvious that if the small pulley were to be operated, as has been described, but without the intervention of the bar K, as soon

as it came in contact with the friction-roller C it would be caused to revolve, thus winding up the chain, turning the crank-lever L, and applying the brakes.

What I claim, and desire to secure by Letters Patent, is—

The combination of the friction-roller C, shoe F, connecting-rods G, and small pulley

D, arranged substantially as described, for the purpose specified.

JOHN L. KNOWLTON.

Witnesses:

C. A. MERRIAM,  
GEO. BAKER, Jr.