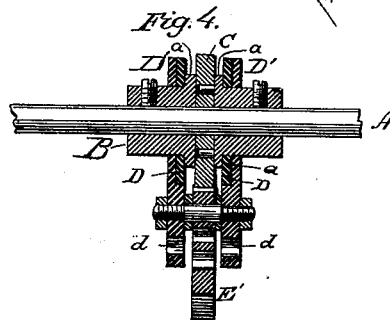
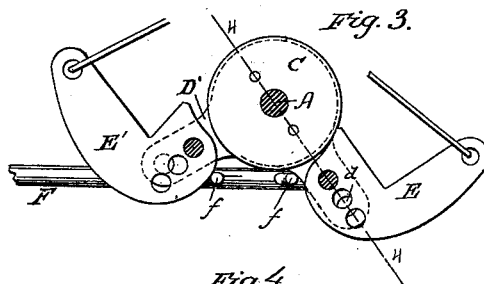
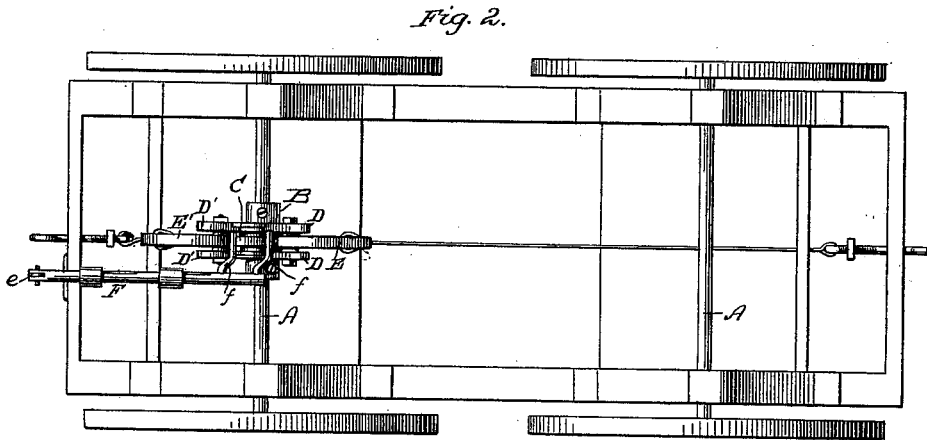
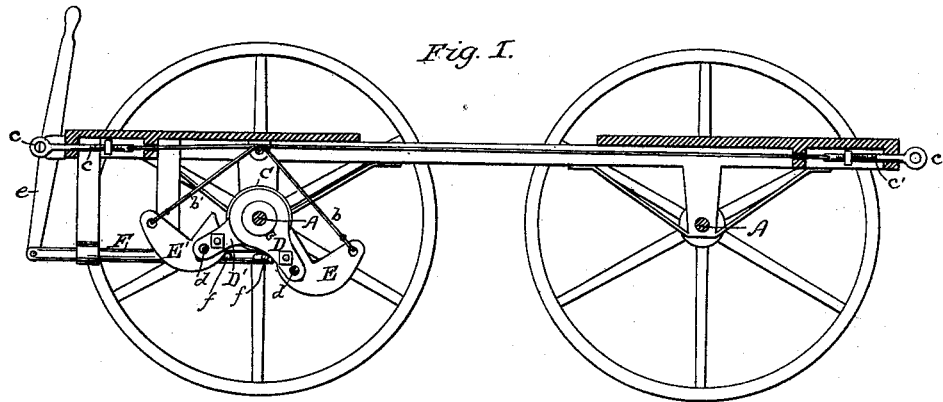


J. HILL.
Car Starter and Brake.

No. 214,913.

Patented April 29, 1879.



Attest:
Clarence Poole
Warren July

Inventor:
Joseph Hill
by Geo. W. Shyres
att'y.

UNITED STATES PATENT OFFICE.

JOSEPH HILL, OF WILLIAMSPORT, PENNSYLVANIA, ASSIGNOR TO HIMSELF
AND JOHN R. T. RYAN, OF SAME PLACE.

IMPROVEMENT IN CAR STARTER AND BRAKE.

Specification forming part of Letters Patent No. **214,913**, dated April 29, 1879; application filed
September 21, 1878.

To all whom it may concern:

Be it known that I, JOSEPH HILL, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented new and useful Improvements in Combined Car Starter and Brake; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object I have in view is the production of a car-starter, also forming a brake, especially adapted for use upon street-cars, which will be simple and strong in construction and not liable to get out of order, and will be efficient in operation, not requiring any attention from the driver in its use as a starter after being shifted to work while the car is going in one direction, and preventing any backward movement of the car, also being easily and conveniently applied as a brake to stop the forward movement of the car.

My invention consists in the construction, arrangement, and combination of the principal operative parts of my starter and brake, all as fully hereinafter explained.

In the drawings, Figure 1 is a sectional view of the floor and trucks of a street-car with my improvement attached; Fig. 2, a bottom view of the same; Fig. 3, a separate view of the double friction-clutch, and Fig. 4 a section of the same on the line 4 4 in Fig. 3.

Like letters denote corresponding parts.

Upon the center of either axle A of the car is keyed a drum, B, having a centrally-projecting friction flange or wheel, C, of any suitable material. On each side of the friction-wheel C the drum has a shoulder, *a*, Fig. 4, and is of smaller size outside of these shoulders. The enlarged ends of arms D D' fit over the ends of the drum and work freely on the same, the arms D' bearing against the shoulders *a*, while the arms D work against the outer face of the arms D'. These arms project from opposite sides of the drum beyond the periphery of the friction-wheel, and have pivoted between their ends clutching-levers E E'. The short arms of these levers extend inwardly toward the friction-wheel, while their long arms, formed about at right angles to the

short arms, project upwardly toward the floor of the car, their upper ends being connected by chains and rods *b b'*, running in opposite directions to the draw-bars *c c'*. The bolt which pivots either of the clutching-levers to its carrying-arms may be passed through any of a number of holes, *d*, made in the ends of the arms and the angles of the levers, so that when the friction-surfaces are worn by use, the levers can be adjusted closer to the friction-wheel, thus prolonging greatly the time that one of these double clutches can be used without repair.

F is a horizontal rod, sliding in the ends of hangers supported from the platform of the car nearest the clutch. This rod is moved back and forth by a lever, *e*, pivoted to the platform, which lever may be operated either by the hand or foot of the driver. The rod F preferably extends the whole length of the car, and a lever is situated on each platform to operate it; but when my improvement is used alone as a starter, it may be worked by only one lever. The rod F is situated to one side and just below the friction-wheel C, and has arms *f*, which work back and forth below the friction-wheel. When the rod F is moved in one direction, one of the arms *f* strikes the under side of the clutching-lever and its carrying-arms on the side of the axle toward which the rod is moved and raises them, throwing the lever out of engagement with the friction-wheel. An opposite movement raises and disengages the other clutching-lever, while the first lever drops by its own weight into engagement with the friction-wheel. If the car is being pulled from the draw-bar *c*, the clutching-lever E' should be raised by sliding the rod F forward. Then, when the horse is started, the draft will be upon the long arm of the lever E, and the short arm of such lever will lock against the periphery of the friction-wheel, giving the horse the advantage of the leverage thus obtained till the lever reaches its highest point, when it is out of contact with the friction-wheel. At every start this operation takes place without any further attention from the driver of the car than that of seeing that the clutching-levers are in the right positions.

When the car is in motion, at the instant the traces of the horse are slack the clutching-lever will drop down, and will remain out of engagement with the friction-wheel till the horse tightens in the traces, when the lever will be raised and the clutch operated, so that the starter will be in constant use even while the car is moving. In traveling in the opposite direction, the rod F is shifted and the engagement of the friction-levers reversed.

With my improved starter the car will stand on an up grade, since any backward movement will lock the lever, which is in use as a starter, with the friction-wheel. To stop the forward motion of the car, the rod F is shifted, and the clutching-lever on the forward side of the friction-wheel thrown into engagement therewith. As the car is again started, the lever on the rear side of the friction-wheel is thrown into engagement to act as a starter.

Thus it will be seen that by the movement of a single lever my devices can be worked to act effectively both as a starter and as a brake, assisting the horse and controlling completely the movements of the car.

It will be seen that my improvements can be otherwise applied than to a street-car, since they could be used with good advantage on hand and other cars.

What I claim as my invention is—

1. The combination of the friction-wheel C, the arms D D', and the clutching-levers E E', adjustably pivoted to said arms, constructed and arranged substantially as described and shown.

2. The car starter and brake described, wherein are combined a friction-wheel keyed on an axle and two adjustably-pivoted clutching-levers engaging with opposite sides of such friction-wheel, and connected with the draw-bars and the shifting-rod, and operated by a lever, substantially as set forth and shown.

This specification signed and witnessed this 26th day of July, 1878.

JOSEPH HILL.

Witnesses:

JOHN J. HARRISON,

THOS. H. HARTMAN.