# L. KIMPEL & E. FERCHLAND.

## STREET-CAR BRAKE.

No. 186,679. Patented Jan. 30, 1877.

*Fig. 1.*

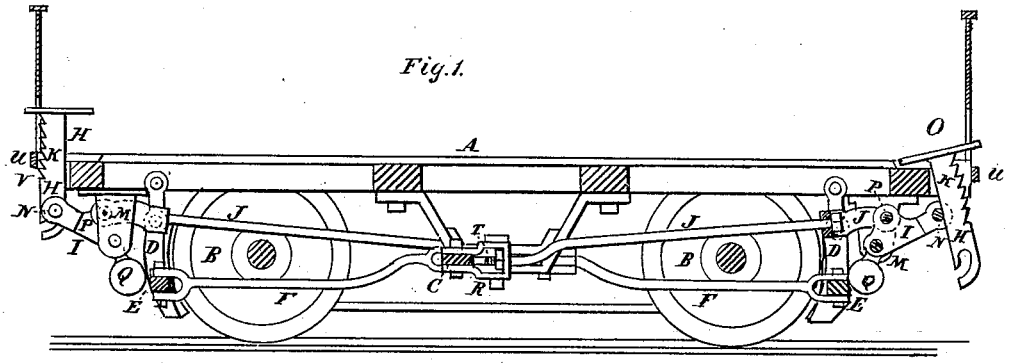



*Fig. 3.*

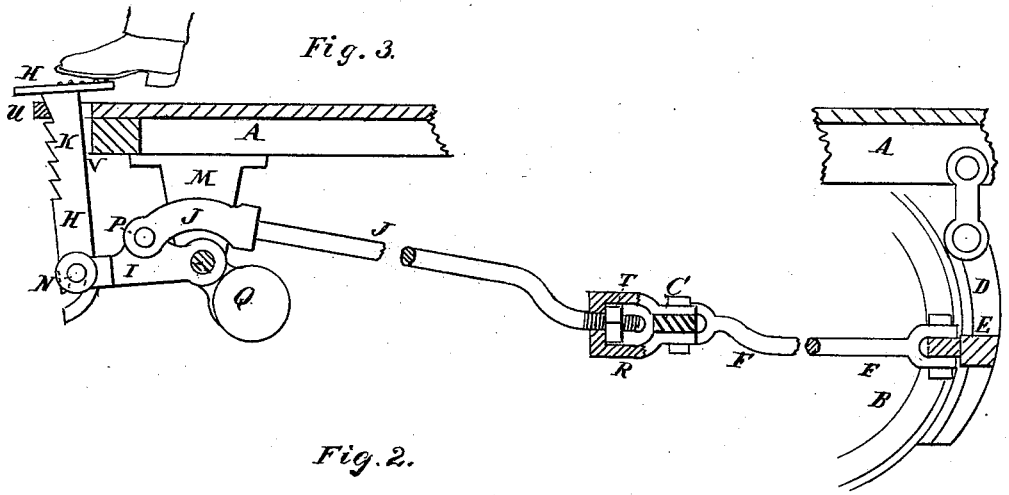
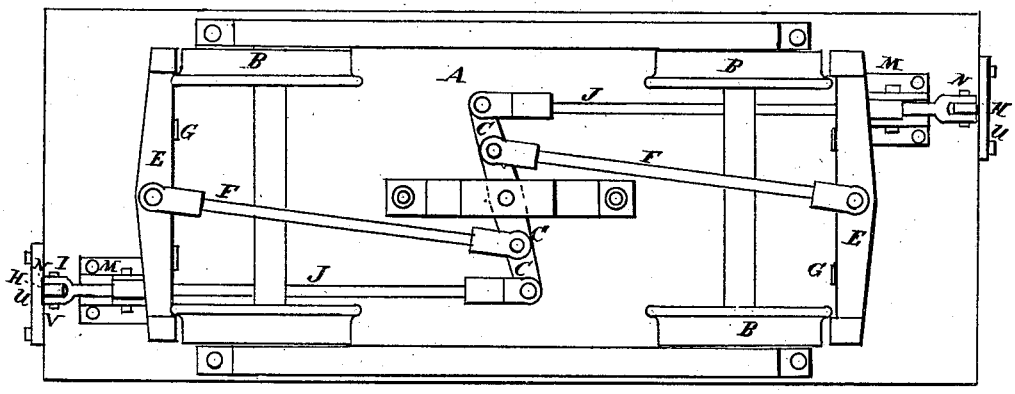



*Fig. 2.*




*Witnesses.*

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# UNITED STATES PATENT OFFICE.

LOUIS KIMPEL AND ERNST FERCHLAND, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN STREET-CAR BRAKES.

Specification forming part of Letters Patent No. **186,679**, dated January 30, 1877; application filed February 5, 1876.

*To all whom it may concern:*

Be it known that we, LOUIS KIMPEL and ERNST FERCHLAND, both of the city of Brooklyn, in the county of Kings and State of New York, have jointly invented a certain Improved Brake for Horse-Cars, of which the following is a specification:

The class of brakes herein referred to is the kind used for horse-cars and operated by foot, instead of by a hand-windlass.

The foot-brakes as heretofore made require a nearly radical change of all parts in converting the ordinary windlass hand-brake to the foot-brake; they have no provision for readjustment for proper operation after being in use for a time and when their shoes become worn; and they have always some operating part projecting above the rear platform, while the driver operates on the front platform, and thereby said operating part admits passengers to interfere with it.

This invention relates to the combination of peculiarly-arranged balanced foot-levers, with provision for entirely detaching the treadles from said levers, expansible brake-rods, with the ordinary horizontally-moving brake-lever, the ordinary shoes and brake-bars and springs, so that by these means the ordinary hand-windlass brake already in use may be converted to the foot-brake with a limited expense. By means of having the brake-rods adjustable in length or expansible the foot-lever can always be adjusted to come on its dead-center for full braking, although the shoes may have become worn, and thereby the full power of the foot-lever is always retained. By means of entirely detaching the treadle from the foot-lever all parts connected and operating above the rear platform are disconnected or removed, while the driver uses the brake on the front platform, and the passengers on the rear platform are not liable to interfere with the brake.

In the annexed drawings, Figure 1 represents a vertical longitudinal section of a horse-car with our improved brake shown in position while out of action. Fig. 2 is an inverted plan of the same. Fig. 3 represents a detached vertical longitudinal section of a portion of the car with our brake shown on a somewhat larger scale than in the former figures, and shown in position while in action.

A represents the car-body, which is provided with a brake-connection on both of its ends, close to the dash-board of the same. B B represent the wheels, C the usual brake-lever, D D the brake-blocks, E E the cross-bars combining each pair of blocks, and F F the connecting-rods from the said cross-bars to the brake-lever C; and G G represent the usual springs employed to press off the blocks D from the wheels. All of these working parts are arranged in the usual manner; but, instead of the usual hand-windlass and chain to operate the brake-lever, we employ a treadle, H, a lever, I, and a connecting rod, J, from said lever I to the brake-bar on each end of the car, so that each end of the car is provided with a treadle, H, a lever, I, and connecting-rod J. The treadles H have each a flat top platform, made rough for the proper bearing for the foot upon it, and they have each a vertical flat shank, K, which passes through a slot in the end of the car-platform. The levers I have their fulcrums in the hangers M, which are secured on the bottom side of the car-platform at the proper distance from the shank of the treadle. The outer end of each of the levers I is slotted for the shank of the treadle to pass in it, and through said end is secured a cross-pin, N, upon which the slotted end of the treadle is resting, as shown in Fig. 3. The slot in the end of the shank of the treadle is curved, as shown, so that the treadle remains engaged upon the pin N while the brake is operated. Whichever treadle is not required to be operated can be drawn up and disengaged from the lever I, as shown at O in Fig. 1. The object of having said treadles to disconnect entirely from the brake on the foot-levers I is so that passengers on the rear end or rear platform of the car are prevented from operating the brake and interfering with the management of the brake by the driver on the front platform of the car; and said levers I are combined with their connecting-rods J by means of pivots P, which are located on the same arm of the lever upon which the treadle engages the same. Each of said levers has a balance-weight, Q, cast or secured to the opposite side of its

arm, to which the pivots N and P are attached, so that by means of said weight said arm, with the treadle, is raised, ready for operation. The pivot P is located sufficiently distant from the fulcrum of the lever to obtain the required motion from it to the brake-lever; but its position is such with respect to the fulcrum and the end of the brake-lever that whenever the brake is made to bear fully, said pivot P is brought nearly in line or on its dead-center with said fulcrum and said brake-lever C. The end of the connecting-rod J attached to the crank-pin or pivot P is bent to allow said pivot to turn sufficient to come to the dead-center, but that said end of the rod stops against the fulcrum-pin of the lever I, to prevent the pivot P from passing beyond said dead-center. To adjust the connecting-rod J so that it may have the proper length after being in use for a time, we construct said rod with a loop, R, and with a threaded end to pass through said loop, and with screw-nuts T, as shown, or in any suitable manner for expanding or contracting said rod properly. In order to hold the brake and to brake the wheels with more or less force without retaining the foot upon the treadle, we employ a stop cross-bar, U, across the front end of the slot V, through which the shank of the treadle in the platform passes, and make the said shank, on its edge toward the cross-bar U, with teeth, as shown, so that the treadle can be pressed forward with the foot to engage said teeth, and thereby stop said treadle at any point desired and keep the brake engaged.

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

1. The combination of the balanced levers I I, with provision for attaching removable treadles H H, the expansible brake-rods J, with the ordinary horizontally-moving brake-lever, the shoes, and brake-bars, substantially as and for the purpose herein set forth.

2. The brake-lever C, brake-bars E, rods F, and shoes D, in combination with the treadles H, the levers I, and the rods J, provided with means of adjusting them in length, substantially as and for the purpose herein set forth.

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Witnesses:
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