

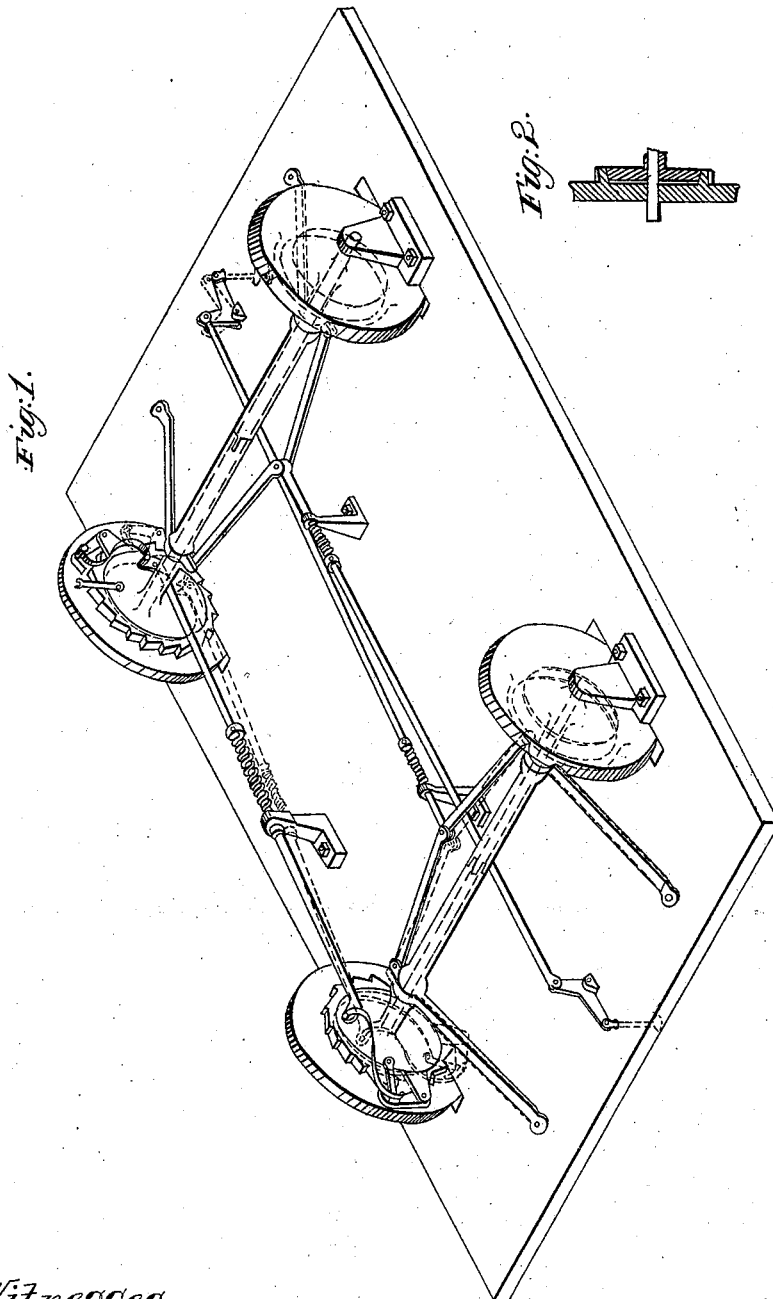
J. E. KELSEY.

Car Starter.

2 Sheets—Sheet 1.

No. 54,363.

Patented May 1. 1866.



Witnesses.

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Fig. 1.

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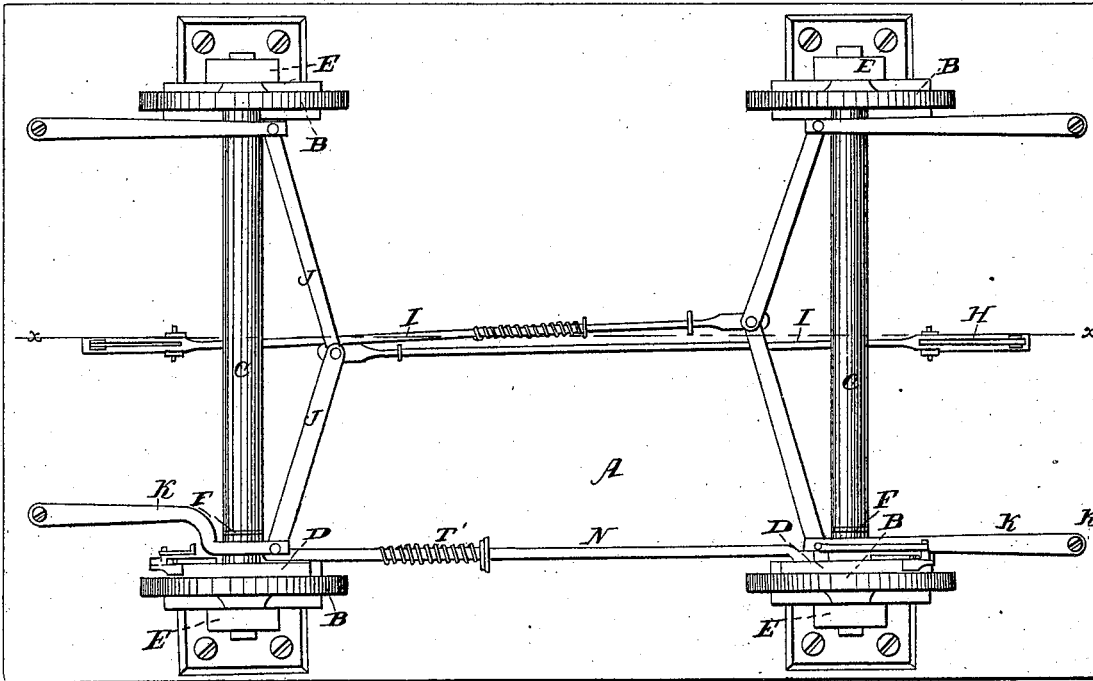


Fig. 2.

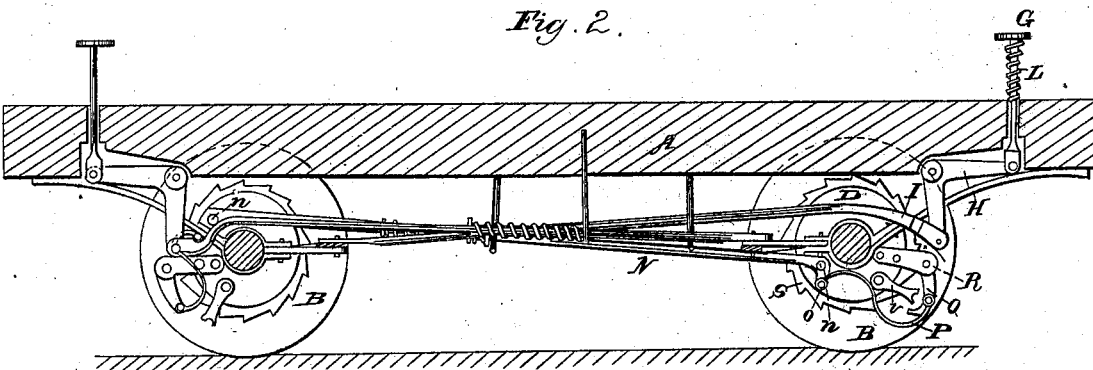


Fig. 4.

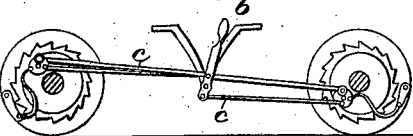
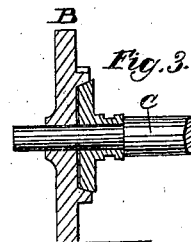


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES E. KELSEY, OF PROVIDENCE, RHODE ISLAND.

IMPROVED MODE OF STOPPING AND STARTING CARS.

Specification forming part of Letters Patent No. 54,363, dated May 1, 1866.

To all whom it may concern:

Be it known that I, JAMES E. KELSEY, of the city and county of Providence, and State of Rhode Island, have made a new and useful Improved Car Brake and Starter; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a view of the under side of a car-bottom. Fig. 2 is a nearly central longitudinal vertical section on the line *x x*, Fig. 1. Fig. 3 is a detached view, partly in section, showing the relation of the axle and clutch to the wheel. Fig. 4 is an elevation or diagram view, showing a modification in the manner of changing the engagement of the pawls with the wheels, according to the direction in which the car is moving. Fig. 5 is a perspective view of the under side of the car.

The invention consists of devices for stopping and starting street-cars, making the momentum of the car as its motion is arrested to act upon a spring, which, when the engagement of the brake is terminated, gives a forward impulse to the car and assists in starting it.

The arrangements for acting upon the brake and starter are under the control of the driver, who operates by pressing with his foot upon a piston which projects upward through the end platform of the car, and the piston arrangement is afforded at each end of the car, so as to be convenient to the driver in whatever direction the car is traveling.

Each of the pistons is connected to a certain pair of wheels and possesses distinct apparatus, so that the invention may be said to be duplicated, each end being provided with its appropriate arrangement and connections.

Speaking in general terms, by the pressure upon the piston a connecting-rod is caused to press upon a toggle, which pushes friction-clutches into engagement with a pair of wheels, which latter, causing the friction-clutches to rotate, draw upon a rod and act upon a spring to condense or elongate it, the spring reacting to rotate the clutches and the wheels, as the

pressure of the driver's foot upon the treadle is withdrawn.

In the drawings, A is the bed or bottom of the car, and is supported by four wheels, B, which are shrunk, by pairs, upon the axles C, and are journaled in hangers E, which are attached to the car-bottom.

Upon the axle C, in the neighborhood of each wheel, (or of but one wheel on each axle, if that should prove sufficient,) is a friction-clutch wheel, D, on a sleeve, F, through which latter the axle C passes. The sleeve and clutch, (best seen in Fig. 3,) occupy a position between the central or enlarged portion of the axle and the wheel B, and the friction-clutch has a conical periphery, so as, when passed outwardly, to engage with a correspondingly-shaped recess in the inner face of the wheel. The effect of this motion will be made more apparent presently; but it is evident that by being forced into the wheel the motion of one will be communicated to the other, as they will bind against each other. The motion of the sleeves F and their attached friction-clutches D is caused by the imposition of the driver's foot upon the treadle G, which partially rotates the rock-shaft H, a thrust motion being communicated to the rod I, which straightens the toggle-levers J J, and the latter being connected to the ends of the levers K, which are pivoted at *k* to the under side of the car, and embrace the sleeves F. The said sleeves are thereby thrust outwardly, and the friction-clutch wheel protruded into the above-mentioned recess in the inner faces of the wheels. When the pressure of the foot is withdrawn from the treadle G, the latter rises by the influence of a spring, L, which is placed beneath it, or by means of a spring, M, which is placed upon the connecting-rod I, or at some other appropriate point, to restore the parts to their normal condition and withdraw the friction-clutches from the car-wheels, as it is *sine quo non* of the arrangement that when the brake is out of use the wheels shall run perfectly free and unimpeded.

It is a necessity of the case that the car should run with equal facility in either direction, and that the brake arrangement should be under the control of the driver, who occupies the forward platform of the car when in motion. A treadle is therefore provided at

each end, and is made to operate in conjunction with one pair of wheels, and the treadles actuate the apparatus in connection with the pairs of wheels at the opposite ends of the car.

The action of the other portions of the apparatus may be as well understood by a recitation of its action as by any other mode of description, and is as follows: The pressure being placed upon the treadle G, and the friction-clutch wheel (or wheels) being driven into the recess on the inner side of the wheel B, the continued motion for a short space of time of the latter causes the clutch D to revolve in the same direction for about one-quarter of a revolution, and thus causes the endwise motion of the rod N, which is pivoted thereto at *n*. On the end of the bent arm *o* of the rod N is placed a spring, P, shaped like the letter S, and to this spring is attached a pawl, Q, pivoted on a holder, R, which is firmly attached to the clutch-wheel D, so that as the said wheel moves in conjunction with the car-wheel B, the pawl Q is drawn into engagement with the ratchet-teeth S on a flange of the wheel B, so as to rotate the said wheel, when, by the loosening of the clutch-wheel D from its socket in the wheel B, the rod N is abandoned to the influence of the spring T.

The rod N is connected, in the manner described, to the clutch-wheels D D on the two axles of the car, respectively, so as to act upon both simultaneously, and cause the spring T to act upon such one of the clutch-wheels as may be in engagement with its appropriate wheel. By this means, as either clutch-wheel is pressed into its socket and is rotated by the car-wheel, the rod N is moved longitudinally, and the spring T is compressed as long as the pressure remains upon the treadle, and upon the removal of said pressure assuming its normal proportions and restoring the clutches to their normal position, and in doing so revolving the wheels by the engagement of the pawl Q with the ratchet S. This latter operation only takes place with the wheels on a given axle at any one time, as the clutches and wheels on the other axle are not affected by the same treadle, except by the rod N, which has no power to drive the clutch into its socket so as to come in friction contact with its car-wheel. The motion, however, of the clutch D, which is not in engagement with the car-wheel, has a tendency to bring its pawl Q in engagement with its ratchet S, and to avoid this pivoted holders V are provided on the clutches, which may be made to prop up the pawl, which is to be temporarily thrown out of engagement with the ratchet, so as only to have the pawl appertaining to the hind pair of wheels, for the time being, free to engage with the ratchet. This holder V will require to be shifted on each

clutch as the car is about to return and retrace its course, changing the relation of the two ends, and to save the trouble of reaching to the inside of the wheels I propose to make an arrangement like that shown in Fig. 4, where the springs P are connected to vibrating blocks, whose motion, under the impulse of the lever *b* and connecting-rods *c c*, has the effect of permitting or preventing the engagement of the pawls with their respective ratchets, according as the lever *b* is rocked one way or the other.

The car has a perfectly free movement either way when the brake is not applied, and there is no motion of the machinery except when the brake is applied.

It will be perceived that the S-shaped spring P is used to keep the pawl Q in or out of engagement with the ratchet, as may be required.

The rod N, which connects the clutches on the respective axles, is pivoted to them above and below their centers, respectively, the object of which is to give them reverse motions, so that under the change of circumstances due to the different motions of the car the contact of either of the friction-wheels with their appropriate car-wheels shall cause the rod N to move in the same direction and condense the spiral spring T, which restores the normal positions of the parts by pressing the pawl against the ratchet on the car, and thereby assisting in starting the car.

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

1. The arrangement of the rod N, connected above and below the fore and hind axles to their respective friction-wheels, so as to give the reverse motion on the said wheels by the same longitudinal motion of the rod, substantially as described.
2. The S-shaped spring, connecting the pawl and the rod N, substantially as and for the purpose described.
3. The combination of the ratchet-teeth on the wheel B, the pawl Q, the spring P, rod N, spring T, and friction-wheel D, operating substantially as described.
4. The combination of the rod N, spring T, and the friction-wheels D D of the respective axles, constructed and operating as described.
5. The friction-wheel D, revolving by contact with the car-wheel, to simultaneously arrest the latter and compress the spring on the rod N, substantially as described.

The above specification of my invention signed by me this 2d day of November, 1865.

JAMES E. KELSEY.

Witnesses:

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