

Patented Sept. 12, 1882.

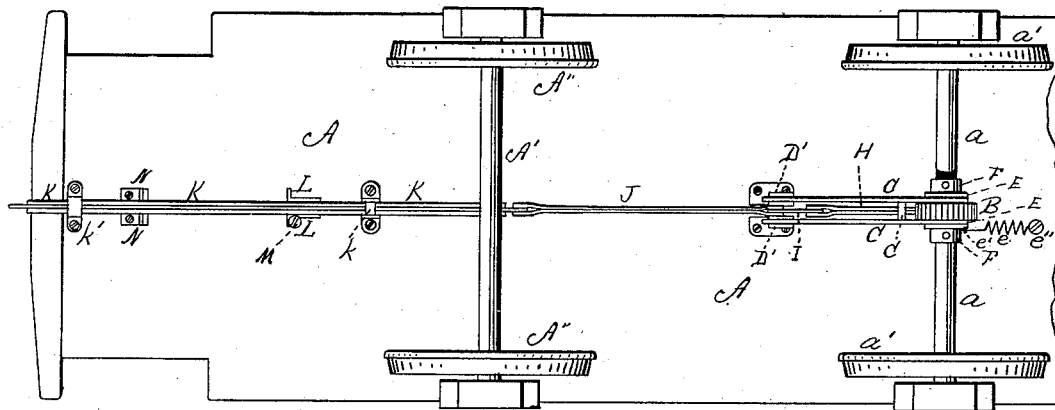


Fig-1.

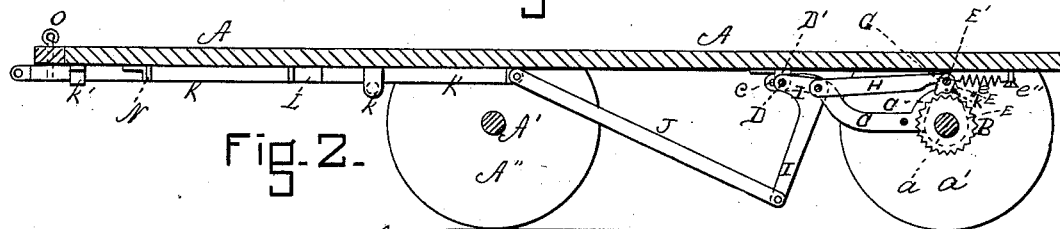


Fig. 2.

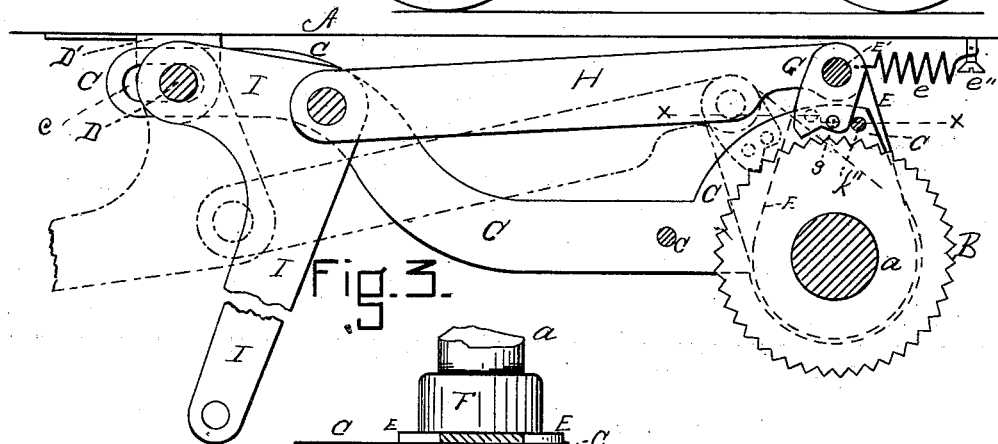
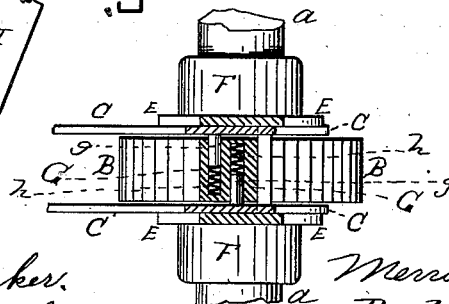


Fig. 3.



WITNESSES

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Fig-4-

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CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 264,124, dated September 12, 1882.

Application filed January 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, MERRICK M. BARNES, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Car-Starters, of which the following is a specification.

This invention is intended principally for application to street-cars; and its object is to facilitate and render easy the starting of the car, to the end that the severe and sudden strain upon, and consequent wear and injury to, the horses incident to the effort to move such a dead weight may be avoided.

My invention consists of mechanism, fully described below, by means of which power applied to the draw-bar in the ordinary manner is communicated not directly to the car-body, but in an efficient manner to an axle, causing the wheels to accomplish a partial rotation, moving the car, before the draw-bar has begun to act directly upon the car-body; and this preliminary power is, by means of said mechanism, greatest at the beginning of its application to the axle, and grows gradually less with the accelerated movement of the car until the draw-bar begins to act directly upon the car-body, when it ceases altogether, and the car being well in motion, the horses can easily keep or accelerate its speed without any sudden strain having been experienced.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a plan view of the under side of the bottom of a car-body provided with mechanism embodying my invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a similar section enlarged. Fig. 4 is a horizontal section taken on line *x x*, Fig. 3.

A represents the bottom of the car-body; A', the axle of the forward wheels, A'', and *a* the axle of the rear wheels, *a'*.

B is a ratchet-wheel fixed upon the axle *a* between the two sides or portions of the frame C, which flank the wheel B on both sides, and whose rear ends surround the axle *a* loosely, its front ends being secured to the bar D, held in the supports D'.

Placed loosely upon the axle *a*, on both sides of the wheel B, between the two parts of the frame C and the collars F, are the upwardly-extending plates or arms E, connected

by a rod, E', and held vertical by the spring *e*, which connects one of them with the car-body, as shown, by means of the pin *e'* on the former and the screw *e''* on the latter.

G is a pawl supported loosely by the rod E', and adapted to fit into the teeth of and engage the ratchet-wheel B. This pawl is provided with two friction-pins, *g g*, one on each side, which project against the sides of the frame C, being held against them by the springs *h h*. A cross-pin, *k k'*, extending across the frame C behind the pawl, acts as a check, as below described.

H is a link connecting the arms E, by means of the pin E', with the elbow-lever I, which is pivoted upon the pin D at one end, and has its long arm pivoted to the connecting-rod J. The rod J connects the lever I with the draw-bar K, which extends under the guides *k k'* (the former being provided with a roller) to the forward end of the car.

L L are wings which, when the car is at rest, lie against the back stop, M.

N N are strong blocks or pieces of angle-iron, usually provided with cushions on their rear faces, and adapted to sustain the forward pressure of the wings L and act as bearings for them after the starter has completed its work.

The operation is as follows: The car being at a full stop, horse-power is applied to the forward end of the draw-bar, with the result that the said draw-bar is gradually drawn outward, its wings leaving the back stop, M, and approaching the bearings N. The forward motion of the draw-bar pulls, by means of the connecting-rod J, the long arm of the lever I upward and forward toward a horizontal position and its short arm downward toward a vertical position, hence drawing forward, by means of the link H, the upper ends of the arms E, thus causing the pawl G to engage the wheel B, which rotates until the mechanism has assumed the position shown in broken lines, Fig. 3, and other intermediate positions unnecessary to illustrate, and finally until the power of the lever I has been exhausted and its long arm has assumed a horizontal and its short arm a vertical position. When this is the case the wings will be against the bearings N, and the car, having been fairly and easily

started, will be drawn along without straining the mechanism. It will be seen that when the draw-bar is first pulled the lever I exerts its greatest power upon the axle and wheels, this power decreasing as the draw-bar is drawn farther out. Thus the greatest power is obtained when most needed, and this power decreases as it is less needed—*i. e.*, as the car is getting under headway—and owing to the length of the long arm of the lever I and its position when the car is at a standstill the exertion required of the horses is very slight at first. When the rods and levers have accomplished their work of aiding the starting of the car and the wings L are against the angle-irons N, a pin, O, may be dropped into the draw-bar, so as to prevent longitudinal movement through the action of the spring *e*, and the strain will thus come entirely and constantly upon the car-body. Upon stopping the car, if the pin O has been used, it should be removed so that the spring *e* may be enabled to draw the parts back into their original positions. The movement of the lower end of the pawl G is guided in its direction not alone by the link H, but by such link as modified by the pressure of the pins *g g* against the stationary sides of the frame C, the movement being thus a compound one, and of such a nature that the application of power to the draw-bar causes the pawl to engage the wheel B, and the rear action of the spring *e* causes it to entirely leave said wheel, so that there is no rattling sound produced by clicking over the teeth, as the pawl is not in contact with the wheel, being guided therefrom, as above described. The cross-pin *k''* prevents the pawl from dropping upon the teeth of the wheel when the lever I is down and not in use, as would be the case if the cars were being backed. It is evident that a duplicate of the above-described mechanism may be placed upon the car in connection with the other axle for drawing the car in the opposite direction, in which instance the usefulness of the cross-pin *k''*

would be apparent, and the pin O could be utilized by dropping it into a corresponding opening in the draw-bar, which is at the rear end of the car, as in Fig. 2, and connected with the mechanism not then in use, thereby preventing any accidental engagement of the pawl G with the wheel B, connected with such unused mechanism, such as might occur if the lever I were struck or the draw-bar tampered with.

In constructing the frame C it is considered advisable to elongate the slots *c*, which secure it to the bar D, in order to accommodate the relative movement of the car-body A and axle *a*.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a car-starter, the combination, with the car-body, of the elbow-lever I, pivoted to or upon the bottom of the car, as shown, one arm of which lever is connected by a rod or link, J, with the draw-bar, and the other arm of which is connected by the link H with a pawl adapted to engage a ratchet-wheel fixed to one of the car-axes, for imparting rotary motion to the axle and running-wheels fixed thereupon in such a manner that the power exerted by the lever is greatest at the start and gradually decreases until the draw-bar draws directly upon the car-body, all constructed and arranged substantially as and for the purpose described.

2. In combination with the stationary plates or frame C and ratchet-wheel B, the pawl G, provided with the spring-pins *g g*, (one or more in number,) bearing against said frame C and projecting from openings in the side of the pawl, and adapted to guide the movements of the free end of the pawl when motion is imparted to its pivotal portion, substantially as and for the purpose set forth above.

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