R. E. HASTINGS & B. W. NAVES.

Car-Starter.

No. 167,528. Patented Sept. 7, 1875.

Fig 1

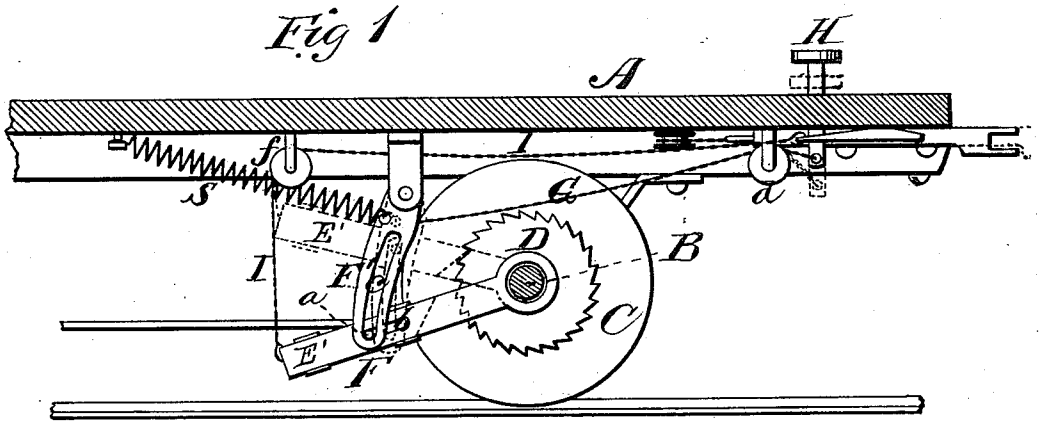
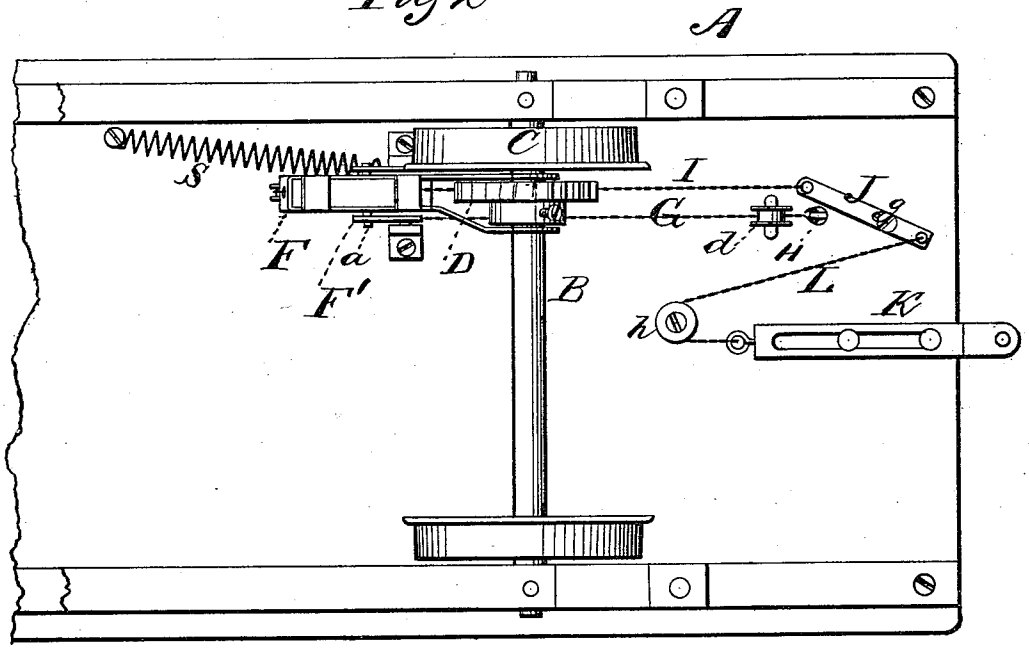


Fig 2



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ROBERT E. HASTINGS AND BENJAMIN W. NAVES, OF PHILADELPHIA, PA.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **167,528**, dated September 7, 1875; application filed August 14, 1875.

To all whom it may concern:

Be it known that we, ROBERT EDGAR HASTINGS and BENJAMIN W. NAVES, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and valuable Improvement in Car-Starters; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal vertical section of our car-starter, and Fig. 2 is a plan view of the same.

This invention has relation to improvements in car-starters, the object of which is to impart a degree of rotation to the transporting-wheels of the car independent of, but simultaneously with, the draft, for the purpose of relieving the draft animals of the intense strain occasioned in overcoming the inertia of a stationary car.

The nature of the invention consists in the arrangement and novel construction, in connection with a rack-wheel on an axle of a car, of an operating-pawl, adapted to be thrown into contact with the said wheel by the operation of a treadle, and to be actuated by means of an endwise-movable draw-bar, whereby the motive power is first applied in turning over the transportation wheels, and is subsequently directly applied to the car, as will be hereinafter more fully explained and claimed.

In the annexed drawings, A designates a car-body, which is supported upon the axles B of transporting-wheels C, in the usual well-known manner. Upon one of these axles a rack-wheel, D, is keyed or otherwise rigidly but removably secured. E′ represents a suitable metallic pawl, which reciprocates freely between the rails of a guide-frame, F, which vibrates vertically on the axle of the car. Pawl E′ is guided, during its reciprocations, by means of lugs *a*, which work freely in slots *b* in the rails of the said frame, which lugs also pass into and through slots *c* in vertically-vibrating arms F′, depending from the platform of a car. This pawl is thrust into engagement with the teeth of rack-wheel D by means of a chain, G, attached to swinging arms F′ below their pivotal point, which chain passes over a pulley-wheel, *d*, near the front of the car, and is rigidly secured to the lower end of a treadle-pin, H, projecting through the platform of the car.

When the operator bears down with his foot upon the head of pin H, pawl E will be thrust into contact with the teeth of rack-wheel D, and forms, as it were, a continuation thereof, its contact therewith being extremely rigid, consequently, when guide-frame F is caused to vibrate vertically upward on its fulcrum on the car-axle, the latter will be carried bodily over, thus overcoming the inertia of the car, and delivering it in this condition over to the draft-power. This result I propose to accomplish by means of the draft or motive power in the following manner, to wit:

A chain, I, is rigidly secured to the free end of guide frame or lever F; passing thence over a pulley-wheel, *f*, rotating in suitable bearings under the car forward to a horizontally-vibrating lever, J, pivoted at *g* to the bottom of the car. Lever J is actuated by means of an endwise-movable draw-bar, K, through the medium of a suitable chain or cable, L, one end of which is rigidly secured to the power end of the said lever, is extended around a horizontally-arranged pulley, *h*, on the bottom of the car, is then carried to the front, and is finally rigidly secured to an eye upon the rear end of the said draw-bar.

The conductor of a car standing upon the platform desiring to start the car will bear down upon treadle-pin H, thus forcing the pawl into rigid contact with the rack-wheel on the axle. He will then start the draft-animals, which will draw guiding-lever F vertically upward through the medium of chain I, pulley *f*, lever J, chain L, pulley *h*, and endwise-movable draw-bar K, when the power of the draft will first be directly expended in starting the car, and afterward applied to moving the car itself through the direct application of the motive power. As soon as the direct draft is applied the conductor will remove his foot from treadle-pin H, when pawl E′ will be retracted from rack-wheel D by the

reaction of a helical spring, S, rigidly secured to the bottom of the car, and to one or both of hangers F′, in which the guiding-frames F vibrate, when, the impetus being given to the car, it will be allowed to proceed on its way without interference or opposition from the pawl.

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

1. The combination of an endwise-movable pawl, E′, vertically-vibrating guide-lever F, and slotted vibrating hangers F′ with chain G, pulley *d*, and treadle-pin H, for thrusting the pawl in contact with the rack-wheel and chains I L, pulley *f h*, lever J, and endwise-movable draw-bar K, substantially as specified.

2. The combination, with a pawl, E′, having lugs *a*, of a vibrating guiding lever, F′, having slots *b*, and vibrating hangers F, having slots *c*, substantially as specified.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

ROBERT EDGAR HASTINGS.
BENJAMIN WALTER NAVES.

Witnesses:
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H. S. WOODBURY.