

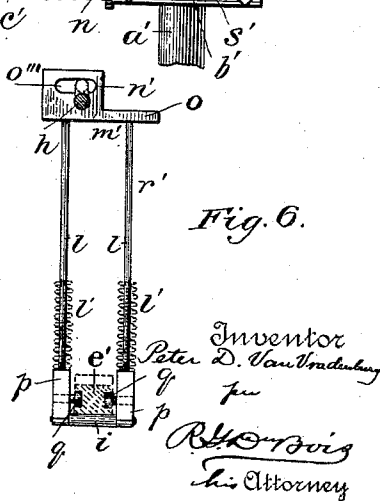
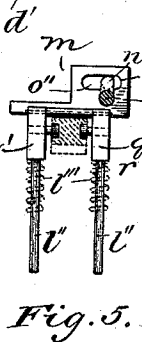
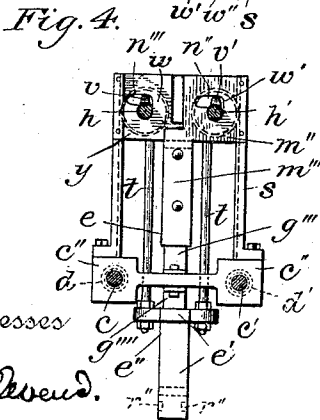
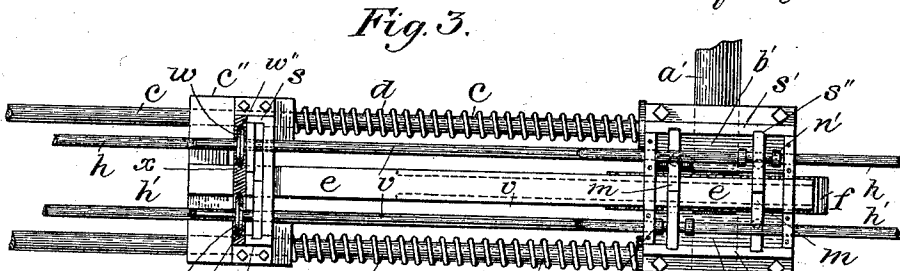
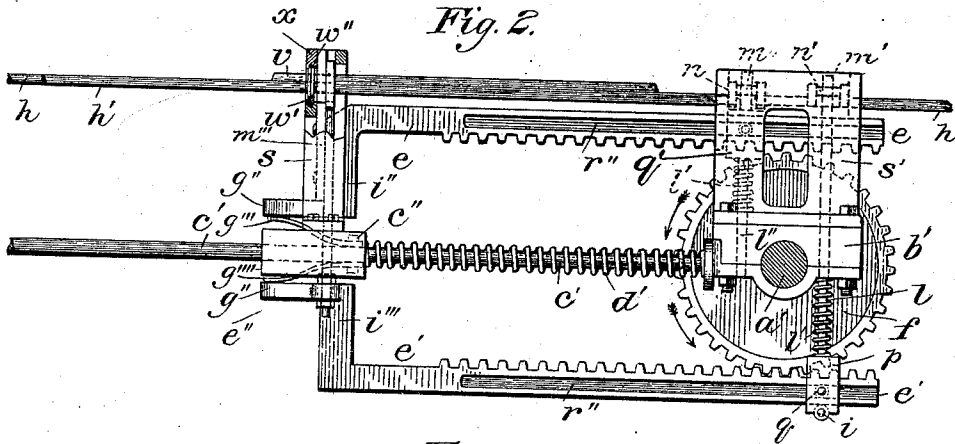
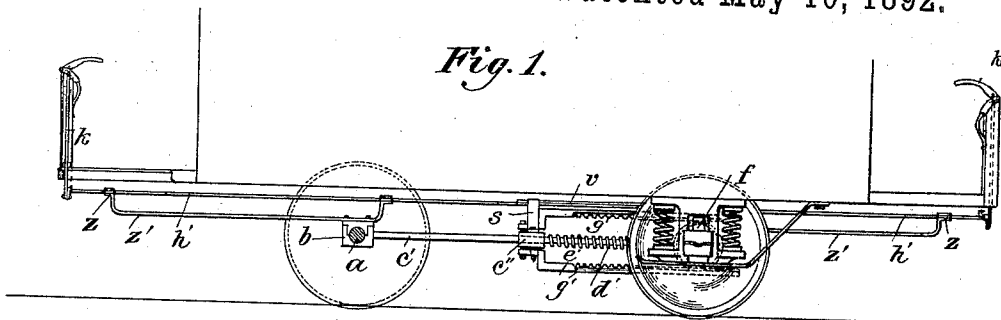
(No Model.)

P. D. VAN VRADENBURG.
VEHICLE STARTER.

2 Sheets—Sheet 1.

No. 474,538.

Patented May 10, 1892.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

P. D. VAN VRADENBURG.
VEHICLE STARTER.

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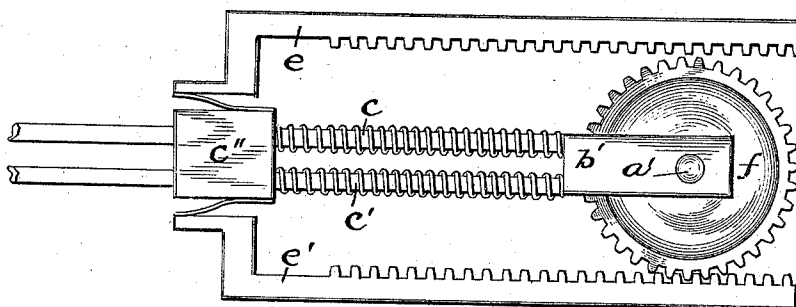


Fig. 7.

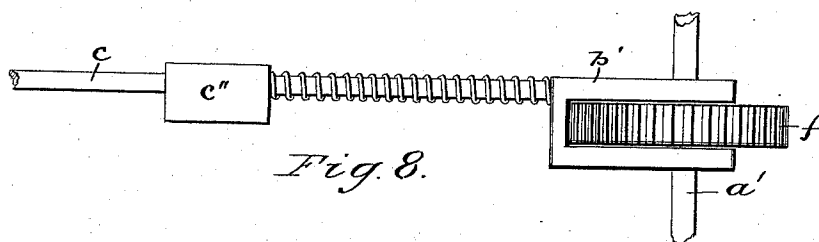


Fig. 8.

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UNITED STATES PATENT OFFICE.

PETER D. VAN VRADENBURG, OF BINGHAMTON, NEW YORK.

VEHICLE-STARTER.

SPECIFICATION forming part of Letters Patent No. 474,538, dated May 10, 1892.

Application filed August 28, 1891. Serial No. 404,029. (No model.)

To all whom it may concern:

Be it known that I, PETER D. VAN VRADENBURG, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Vehicle-Starters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has special reference to an improvement upon my prior pending application bearing Serial No. 385,470, and filed March 18, 1891, for improvements in vehicle-starters, in which a single cog-bar is employed to compress a spring by the forward movement of the vehicle, together with means for using the retractile force of the spring to start the vehicle forward.

The object of my present invention is to provide superior mechanism for accomplishing such purpose; and with this end in view my invention consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side view of my invention as applied to a street-car; Fig. 2, an enlarged side view of the mechanism apart from the car; Fig. 3, a top view of the same; Fig. 4, a rear view of the means for operating the front ends of the cog-bars; Figs. 5 and 6, detail views of the rear hangers; Fig. 7, a side elevation of a modification, and Fig. 8 a top view of the same.

The reference-letters *a a'* represent the front and rear axles, respectively, of an ordinary horse-car, to which my invention in the present instance is applied. Between the axles extend a pair of horizontal rods *c c'*, having their opposite ends rigidly fastened to the front and rear axle-boxes *b b'*. A pair of coil-springs *d* and *d'* surround the horizontal rods *c c'* and are adapted to be compressed by the runner *c''* in its backward movement, their retractile force being used in forcing the runner forward in the starting operation, as will appear hereinafter. These springs are interposed between the runner *c''* and the rear axle-boxes *b'*. A runner *c''* is mounted on these rods, and a pair of horizontal cog-

bars *e e'* are secured to move with the runner by means of a vertical arm *m'''* on the hanger *m'* and bolts *t* on hanger *y*. Leaf-springs *g''' g'''* are interposed between the lips and runner, Figs. 2 and 4, and normally hold the bars *e e'* away from the runner, and hence out of engagement with a gear *f*, fixed on the rear axle.

The cog-bars *e e'* have their rear ends supported in hangers *m m'*. The rear hanger *m'*, which raises and lowers the lower cog-bar, comprises a pair of vertical rods *l l*, having their upper ends fastened to a cross-bar *o* and their lower ends to blocks *p*, which blocks have thimble pins *q*, projecting into longitudinal grooves *r''* in the opposite faces of the lower bar *e'*, whereby the latter is guided in its longitudinal movements. An anti-friction roller *i* is placed across the bottom of the hanger *m'* to support the cog-bar *e'* and relieve the thimble pins of the weight. The rods *l* are each surrounded by coiled springs *l'*, interposed between the bottom of the rear axle-box *b'* and the blocks *p* on the hanger, so that the rear end of the cog-bar *e'* will normally be held down and out of engagement with the gear-wheel in the usual way. The cross-bar *o* at the top is provided with an elongated slot *o'''* to receive the crank-arm *n'* of rock-shaft *h*, whereby the hanger *m'* is elevated. The opposite ends of cross-bar *o* travel in guideways *s''* in the standard *s'*. The contiguous hanger *m*, which actuates and supports the rear end of the upper cog-bar *e*, is provided with a cross-bar *o'*, having an elongated slot *o''*, and it otherwise possesses substantially the same features as the hanger *m'* just described, the difference consisting only in having blocks *q'*, located at the upper ends of the rods *l''* so as to move up and down in holes in the box *b'*, as better seen in Figs. 2 and 5.

The forward ends of the cog-bars are actuated by means somewhat similar to that employed for the rear ends, the object being to raise and lower both ends of a bar together, so that the bar will always maintain a horizontal position and be actuated independently. This mechanism consists of a vertical standard *s*, having a cross-bar *x*, (Figs. 2 and 3,) in which is mounted two wheels *w w'*. These wheels have their peripheries beveled

to fit in an annular concavity w'' in the cross-bar to retain them in place. Each wheel is provided with an oblong opening, through which the rock-shafts h h' and their feather keys or beads v v' pass. Alongside these wheels are placed a pair of hangers. The hanger which actuates the upper bar e consists of a flat block m'' , having the downwardly-extending arm m''' bolted to the vertical arm i'' , as seen more clearly in Figs. 2 and 4.

The rock-shaft h' and the bead v' pass through an L-shaped slot n'' in the block m'' , so that when the shaft is rocked the bar will be raised or lowered, as the case may be. Thus, if the shaft h' is rocked so that the bead v' is turned up, as shown in Fig. 4, the upper bar e is raised.

The hanger for actuating the lower cog-bar e' consists of a cross-bar y , like those upon the rear hangers, and this bar is provided, also, with an L-shaped slot n''' to receive the rock-shaft h and its bead v . A pair of rods t depend from the cross-bar y , and their lower ends are attached by nuts and threads to the lip g'' on the lower cog-bar e' . The rods t pass through the runner c'' , which serves as a guide for them.

The rock-shafts h h' are mounted and rotate in bearings z upon the ends of supporting-arms z' , fastened to the car-axles, and the ends of the shafts are provided with any suitable hand-lever mechanism, such as k , by means of which the shafts are operated.

The preferred construction of my invention having been set forth, I will now proceed to describe its operation. When the vehicle is under headway and it is desired to check its speed or accumulate energy for starting it or for assisting it up grade, the shaft h is rocked by raising one of the hand-levers k . This movement gives the rock-shaft a quarter-turn, thereby turning up the bead v and crank-arm n' . The former engages the upper horizontal wall of the angular slot n''' in the block y , raises the hanger supporting the front end of the lower bar e' , and also raises the rear hanger m' , supporting its rear end. The teeth on the lower bar are thus thrown into engagement with the revolving gear f , thereby drawing back the bar and runner. The springs d d' are compressed by this action and their retractile force placed in readiness to be exerted upon the gear f and hence the rear wheels of the vehicle. In bringing the force of the compressed springs into play the rock-shaft h' is rocked a quarter-turn, like the other shaft, thereby bringing the bead v' against the lower wall of the horizontal arm of the angular slot n'' , which depresses the forward end of the cog-bar e , while the crank-arm n depresses its rear end. The teeth then engage the upper part of the gear-wheel. Now, if both bars were left in engagement with the wheel, a perfect lock would be formed and the wheels

rendered immovable; but upon releasing the lower bar e' the force of the springs is at once brought to bear upon the upper bar e and runner c'' and thence upon the rear axle of the car. Hence it is seen that the rock-shaft h' passes through wheel w' , hanger-blocks m'' , and the rear standard s' , and actuates the upper bar, while the rock-shaft h passes through similar connections to actuate the lower bar.

In the modification shown in Figs. 7 and 8 the horizontal rods c c' are placed one above the other, whereby the mechanism is more adaptable to an electric or other vehicle propelled by mechanical power.

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

1. In a vehicle-starter, the combination, with an axle having a gear-wheel fixed thereon, of a pair of separate and independent cog-bars adapted to engage the upper and lower parts of said gear-wheel together or separately, and mechanism, substantially as described, for throwing the racks in and out of engagement, substantially as and for the purpose set forth.

2. In a vehicle-starter, a gear-wheel fixed to the axle of the vehicle, in combination with a pair of separate and independent cog-bars arranged upon opposite sides of the gear, each bar being provided with a pair of springs to hold it out of engagement with the gear, as and for the purpose set forth.

3. In a vehicle-starter, the combination of a gear-wheel fixed to the axle of the vehicle, a pair of separate and independent cog-bars located upon opposite sides of the gear, a pair of springs coiled about rods, a runner adapted to reciprocate upon the rods, hangers connected with the cog-bars, a pair of separate and independent rock-shafts provided with feather-keys, and angular slots in which said keys operate to raise and lower said bars, all arranged and adapted to operate substantially as specified.

4. The combination, in a vehicle-starter, of a gear-wheel fixed to one of the axles of the vehicle, a pair of separate and independent cog-bars adapted to engage opposite sides of the gear-wheel, springs for holding the bars out of engagement with said wheel, hangers for supporting and actuating the bars, a pair of separate and independent rock-shafts provided with feather-keys passing through angular slots, and mechanism for actuating the shafts, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

PETER D. VAN VRADENBURG.

Witnesses:

R. G. DU BOIS,
W. HUME CLENDENIN.