(No Model.)

J. VAN ZANDT.

CAR STARTER.

No. 321,405. Patented June 30, 1885.

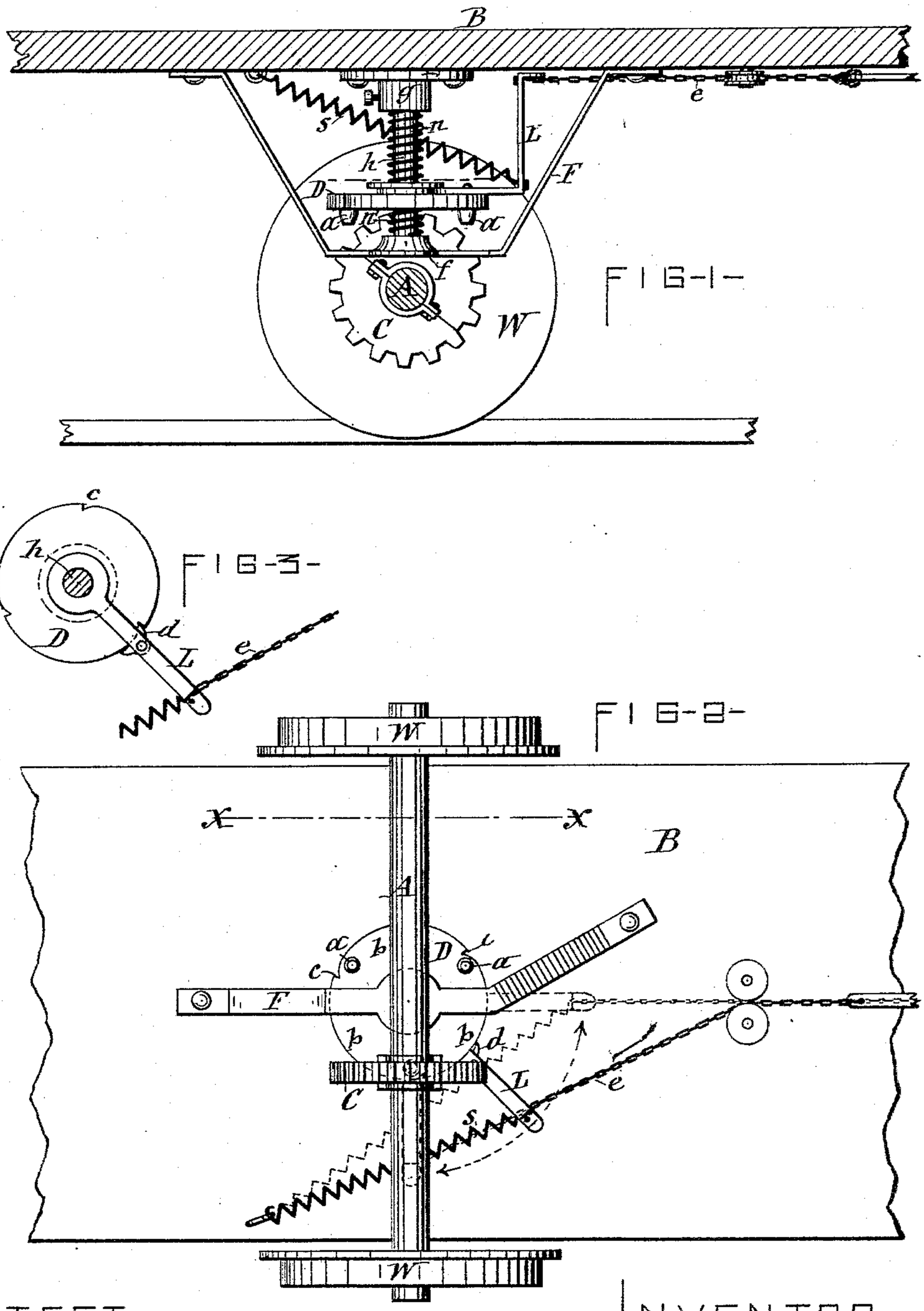

FIG-1-

FIG-3-

FIG-2-

Attest—
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per Wedderburn & Lass & Hay
his Attys

UNITED STATES PATENT OFFICE.

JACOB VAN ZANDT, OF SYRACUSE, NEW YORK, ASSIGNOR OF TWO-THIRDS TO ALVIN J. BELDEN AND CHARLES ROBLEE, BOTH OF SAME PLACE.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 321,405, dated June 30, 1885.

Application filed October 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, JACOB VAN ZANDT, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Car-Starters, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

In said drawings, Figure 1 is a side elevation of my invention, taken on line *x x* in Fig. 2. Fig. 2 is an inverted plan view, and Fig. 3 is a detached top view of the cam-wheel and its actuating-lever.

Similar letters of reference indicate corresponding parts.

This invention relates to the class of car-starters which are designed for use on street-cars propelled by horse-power; and the object of the invention is to provide simple and efficient means by which the draft of the horses obtains a leverage on the axle of the car, which leverage greatly relieves the horses of the strain ordinarily required to start the car.

In the annexed drawings, B represents the bottom of the car-body. A denotes one of the axles of the car, and W W the wheels affixed to said axle. On the axle A is rigidly secured a gear-wheel, C, and on the bottom of the car-body B is attached a frame, F, provided with a socket, *f*, in which is stepped a vertical shaft, *h*, sustained in its upright position by another socket, *g*, which is secured to the under side of the car-body and has journaled in it the upper end of said shaft. On the shaft *h* is loosely mounted a horizontal wheel, D, the under side of which is provided with cams or lugs *a a*, adapted to interlock with the gear-wheel C, and arranged equidistant from the center of the wheel D, and with blank spaces *b b* between them of such lengths as to allow the wheel C to turn freely between the cams *a a* of the wheel D. On the shaft *h*, above the wheel D, is pivoted a lever, L, to the free end of which is attached the draft chain or cable *e*, which is connected either with the pole or whiffletree to which the horses are hitched, so that the draft of the horses is transmitted direct to the lever L. A tractile spring, S, is connected at one end with the car-body or with a suitable object attached to said body, and the opposite end of said spring is connected with the lever L, to draw the same rearward and take up the slack of the draft-chain when the horses are halted or checked in their movement. On the lever L is pivoted a pawl, *d*, adapted to engage with notches or ratchets *c* on the wheel D, which pawl and ratchets are so arranged that when the lever L is swung by the draft of the chain *e*, said pawl shall engage with one of the ratchets, and when the lever L is drawn back by the spring S the pawl *d* will liberate itself from the ratchet.

In order to allow the wheel D to accommodate itself to the vertical vibrations of the car, said wheel is supported yieldingly in its position by means of two spiral springs, *n* and *n'*, surrounding the shaft *h* above and below the wheel D, and bearing, respectively, on said wheel and on the two sockets *g* and *f*.

The operation of my invention is as follows: When the car is at rest and the chain or cable *e* relieved of the draft, the lever L is held yieldingly in a transverse position in relation to the cars by means of the spring S, which draws said lever rearward until one of the arms *a* on the forward portion of the wheel D rests against the gear-wheel C, said wheel standing thus under one of the blank spaces *b* of the wheel D. When starting the horses hitched to the car, the draft comes on the chain or cable *e*, which draws the free end of the lever L forward and swings the same into a longitudinal position in relation to the car and in line with the line of draft, as represented by dotted lines in Fig. 2 of the drawings. During this movement the pawl *d* of the lever engages the ratchet *c* of the wheel D, and thus compels said wheel to make about one-fourth, more or less, of a revolution, and in this movement of the wheel D the cam *a* back of the gear-wheel C engages the latter, and thereby transmits motion to said gear-wheel, and inasmuch as this wheel is rigidly attached to the axle A the latter partakes of said motion, and thus starts the car sufficiently to greatly relieve the horses of the strain ordinarily required to accomplish the same.

It will be observed that by making the gear-wheel in two halves and clamping the same on

the axle, as represented in Fig. 1 of the drawings, my invention is readily applied to almost any car, the frame F, with its appurtenances, being easily attached to the under side of the car without interfering with the existing structure of the car.

Having described my invention, what I claim as new is—

1. A car-starter comprising a gear-wheel fixed to the car-axle, a pivoted wheel having cams adapted to engage the gear-wheel, and provided between its cams with blank spaces to allow free rotary motion to the gear-wheel, a lever for turning the cam-wheel, and draft-connection from the horses to the lever, substantially as and for the purpose set forth.

2. The combination, with a car, of the gear-wheel C, fixed to the axle, the wheel D, having cams *a a a*, with the blank spaces *b b b* between said cams, and provided with ratchets *c c*, the pivoted lever L, provided with the pawl *d* and the tractile spring S, and draft chain or cable *e*, connected with the lever L, substantially in the manner and for the purpose shown and set forth.

3. In combination with the car-body, car-axle, and gear-wheel secured to said axle, the wheel D, mounted loosely on a vertical shaft and supported yieldingly in its position, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 23d day of October, 1884.

JACOB VAN ZANDT. [L. S.]

Witnesses:
FREDERICK H. GIBBS,
WILLIAM C. RAYMOND.