(No Model.) 3 Sheets—Sheet 1.

T. OWENS.

CAR STARTER.

No. 262,825. Patented Aug. 15, 1882.

Fig. 1.

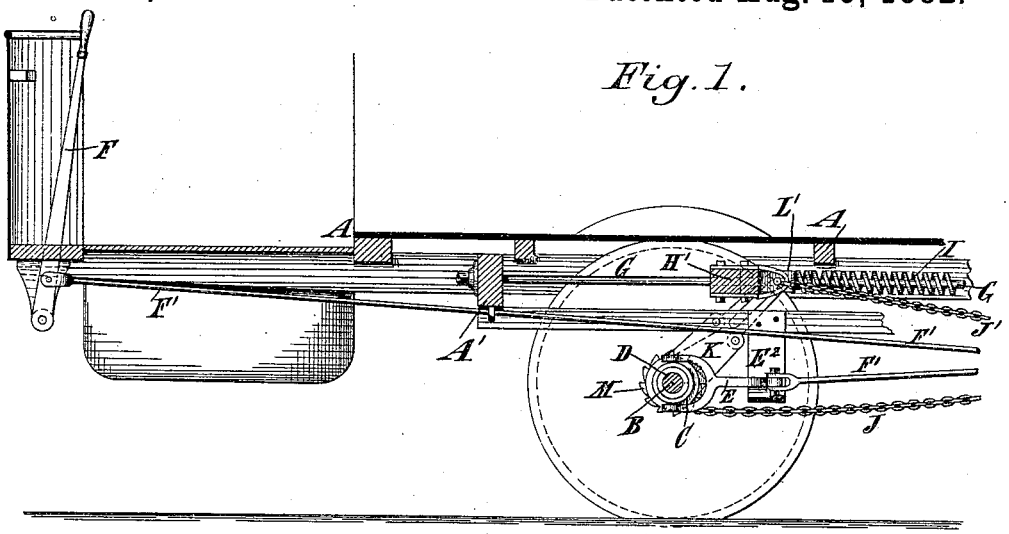
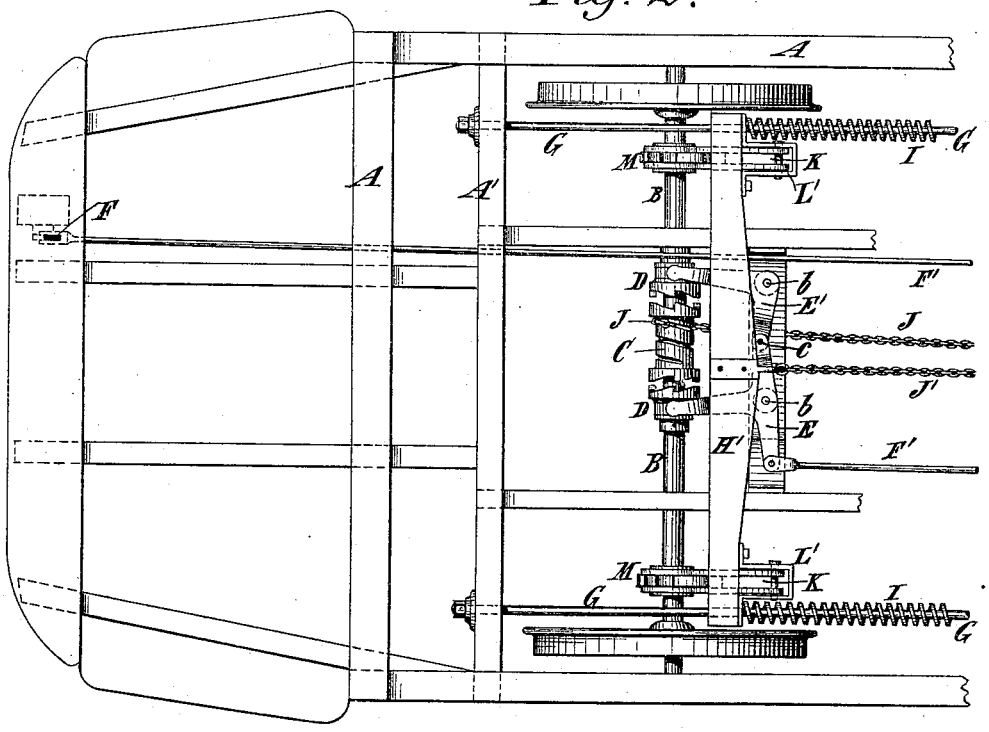


Fig. 2.



Witnesses.
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Jno. T. Haynes

Inventor.
Thomas Owens
by his Attorneys
Brown & Brown

(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

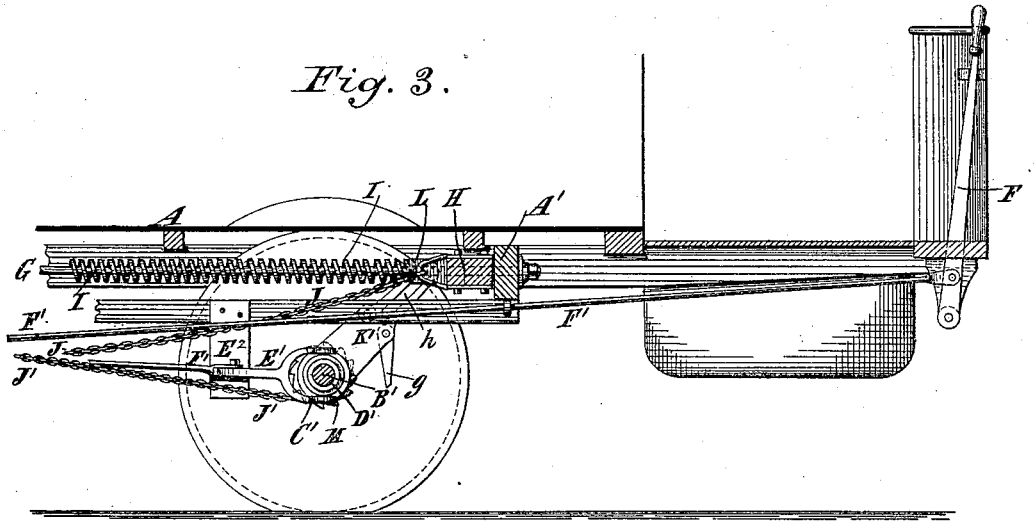
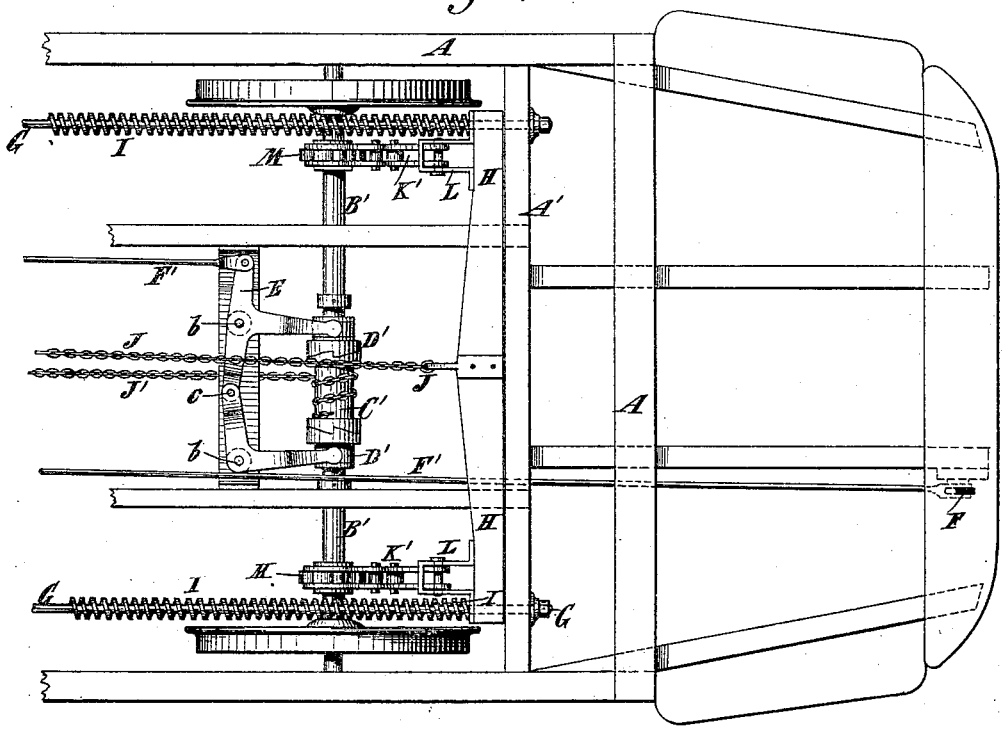


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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CAR STARTER.

No. 262,825. Patented Aug. 15, 1882.

Fig. 5.

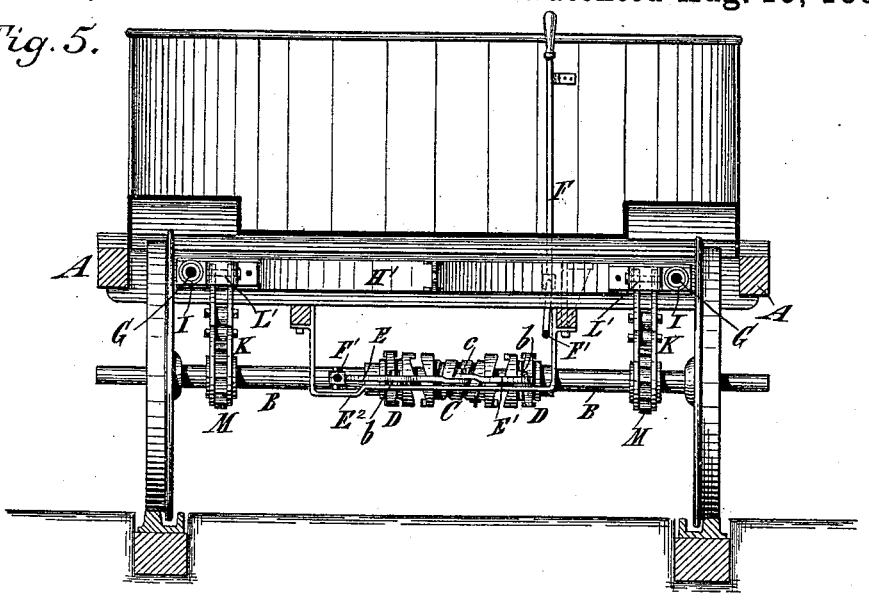


Fig. 6.

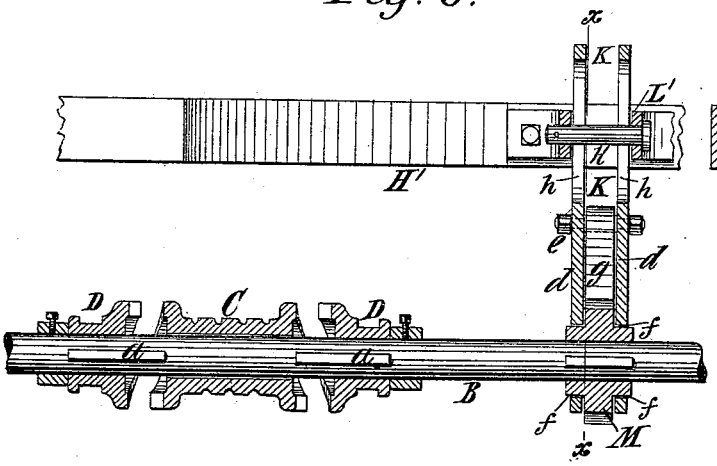
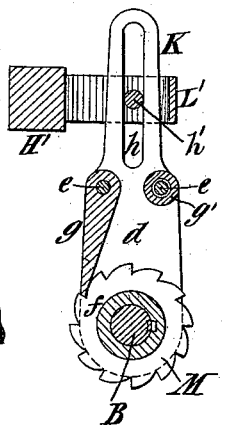


Fig. 7.



Witnesses.

Wm. Schwanhausser

Fred. Haynes

Inventor.

Thomas Owens

by his Attorneys

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UNITED STATES PATENT OFFICE.

THOMAS OWENS, OF YONKERS, NEW YORK.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 262,825, dated August 15, 1882.

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

To all whom it may concern:

Be it known that I, THOMAS OWENS, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Car-Starters, of which the following is a specification.

My invention relates to street-car starters in which springs are so connected by chains or other connections with drums and clutches upon the axles that when the drums are thrown into gear with the axles the springs will be compressed, and thereby retard and check the rotation of the axles and stop the car, while the power so stored up in the springs will be exerted upon the axles to start the car as soon as the drums are released from the axles to permit the springs to expand.

The object of my invention is to simplify the construction of such car-starters, and also to provide for using long spiral springs, so that the required amount of spring-power can be obtained without making the springs of very heavy metal; and my invention consists in a novel manner of combining the several parts of the mechanism employed so as to provide a simple, cheap, and effective attachment for a car, which will not be likely to get out of order.

In the accompanying drawings, Figure 1 represents a longitudinal section of one end portion of a street or horse car embodying my invention. Fig. 2 represents a plan thereof with the floor of the car removed. Figs. 3 and 4 represent respectively a longitudinal section and a plan of the other end portion of the car. Fig. 5 represents an end view of the car. Fig. 6 represents a transverse section of a portion of the car upon a larger scale, and Fig. 7 represents a section on the dotted line *x x*, Fig. 6.

Similar letters of reference designate corresponding parts in all the figures.

A designates the main frame of the car, and B B′ designate the two axles, which are adapted to rotate in suitable journal-boxes, (not here shown,) but which may be of any construction. Upon the axles B B′ are drums C C′, which are adapted to rotate loosely on the axles; and D D′ designate clutch-pieces, which are engaged with the axles, each by a spline or feather, *a*, as shown clearly in Fig. 6, but so that they may be shifted longitudinally thereon. The clutch-pieces D D′ are each operated by a pair of levers, E E′, which are fulcrumed at *b* to a support, E^2, and which are connected together at *c*, so that they may move simultaneously. The connection *c* should be slotted slightly, so as to permit the levers to swing on their fulcrums, and each pair of levers may be operated by a lever, F, arranged adjacent to the driver's platform, as shown in Figs. 1 and 3, and connected with the lever E by a rod, F′. It will therefore be seen that by operating either of the levers F the clutch-pieces D D′ on the axle at the opposite end of the car will be moved longitudinally into or out of engagement with the corresponding drum C or C′, so as to lock said drum fast to or release it from its axle.

A′ designates cross-beams or stretchers, which extend transversely across the car near each end and form part of the rigid framework A of the car. The two timbers A′ are connected by rods G, extending longitudinally of the car, and upon these rods are cross-heads H H′, arranged one near each end of the car.

Between the cross-heads H H′, and upon the rods G, are spiral springs I, which constantly tend to press the cross-heads H H′, away from each other and against the timbers A, as shown in Figs. 3 and 4, and said timbers form abutments by which the cross-heads are arrested, so that when either cross-head is moved inward from the end of the car the springs I will be compressed, and thereby have power stored up in them. The cross-head H is connected by a chain, J, or other flexible connection with the drum C upon the axle B, and the cross-head H′ is connected by a chain, J′, or other similar connection with the drum C′ on the axle B′, as is best shown in Figs. 2 and 4.

Upon the axle B are two levers, K, arranged one near each end, and said levers project upward and fit loosely in stirrups L′ upon the cross-head H′, as shown clearly in Figs. 6 and 7, and also in the remaining figures. Upon the axle B′ are two levers, K′, arranged as above described with reference to the levers K, and projecting through stirrups L on the cross-head H. These levers K K′ may be constructed in any suitable manner and connected with the cross-heads otherwise than as here shown; but I prefer to make them as most

clearly shown in Figs. 6 and 7. Each lever is composed of two plates, *d*, which are secured together by bolts *e*, and which fit loosely upon the hubs *f* of ratchet-wheels M, keyed fast or otherwise secured to the axles B B′, so as to turn freely on said hubs *f*, and each lever carries a pawl, *g*, for engaging with its ratchet-wheel. The plates *d* are kept at a proper distance apart by the pawls on one side and by thimbles or sleeves *g*′, surrounding the bolts *e* and fitting between the plates on the other side. The plates *d* of the levers are formed with slots *h*, and through these and the stirrups L L′ are inserted bolts or pins *h*′, as clearly shown. When either cross-head H or H′ is moved inward from the end of the car the levers K or K′ turn loosely on the hubs *f* of the ratchet-wheels M, and the pawls *g* ride freely over the teeth of said wheels; but when the cross-head moves in the opposite direction the pawls engage with the teeth of the ratchet-wheels and turn them, and with them their axles, thereby starting the car ahead. As the axle continues its rotation the pawl *g* drops off the ratchet-wheel, as shown clearly in Fig. 3, and does not ride on the wheel. Consequently the noise caused by the pawls clicking on the wheels is obviated.

It will be observed that the springs I are very long, and they may be even longer and extend nearly the whole length of the car, and as the cross-heads H H′ move a considerable distance the springs are contracted, so as to greatly reduce their length, and hence they need not be made of so heavy material as they would have to be if they were much shorter.

As represented in the drawings, the car is supposed to be going toward the left, and hence the portion of the car shown in Figs. 1 and 2 is the forward end. When the driver desires to stop the car he operates the lever F on the front platform to throw the clutch-pieces D′ into gear with the drum C′, thereby locking said drum to the axle B′, as shown in Figs. 3 and 4. The drum C′ then turns with the axle, and through the chain J′ draws the cross-head H′ backward or toward the rear of the car, as shown in Figs. 1 and 2. The cross-head H is at this time resting against its abutment A′, and as the cross-head H′ moves it compresses the springs I, which offer a gradually-increasing resistance to the rotation of the axle B′, and finally stop it altogether, thereby effectively braking and stopping the car. The springs I are prevented from extending by the drum C′ being locked fast to the axle B′; but as soon as the driver desires to start the car he operates the lever F on the front platform, so as to release the drum C′ from the axle B′, leaving the drum free to be rotated by the expansive force of the springs I. Thereupon the cross-head H′ is moved forward by the springs I, and through the stirrups L′ it moves the levers K forward, so that their pawls *g* engage with the ratchet-wheels M on the axle B and turn it, or aid in turning it, to start the car forward. As soon as the car is started the pawls *g* drop off the wheels M and hang down clear of them, as shown in Fig. 3. When the car is going in the opposite direction the lever on the platform at the opposite end of the car is operated to throw the drum C into gear with the axle B, and in whichever direction the car is going the drum on the rear axle is always set in operation to stop the car, and the power stored up in the springs is transmitted to the front axle to start the car.

One spring arranged between the cross-heads at about the middle of their length might be substituted for the two springs I.

By my invention I provide a very simple and effective starting apparatus, which may be applied to street or horse cars at a small expense, and which will not be likely to get out of order.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the two car-axles having ratchet-wheels fast upon them, drums having a clutch-connection one with each axle, cross-heads connected each with the drum at the opposite end of the car, a spring or springs arranged between said cross-heads, and levers connected with said cross-heads, and carrying pawls for engaging with said ratchet-wheels to start the car, substantially as and for the purpose described.

2. The combination of the axles B B′, ratchet-wheels M, drums C C′, clutch-pieces D D′, guide-rods G, cross-heads H H′, springs I, connections J J′, and pawl-carrying levers K K′, all substantially as herein described.

3. The combination, with an axle and cross-head of the kind herein described, of the ratchet-wheel M, the lever composed of the plates *d*, fitting loosely at the sides of said wheel, the pawl *g*, and the stirrup L or L′, which is attached to said cross-head and receives the lever through it, substantially as set forth.

THOMAS OWENS.

Witnesses:

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JOHN A. PEASE.