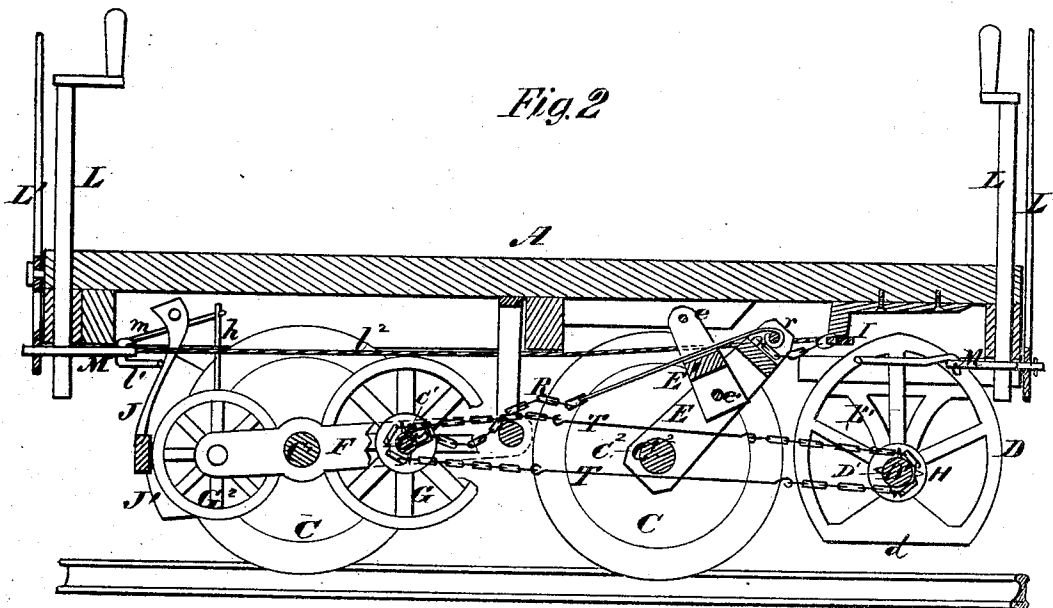
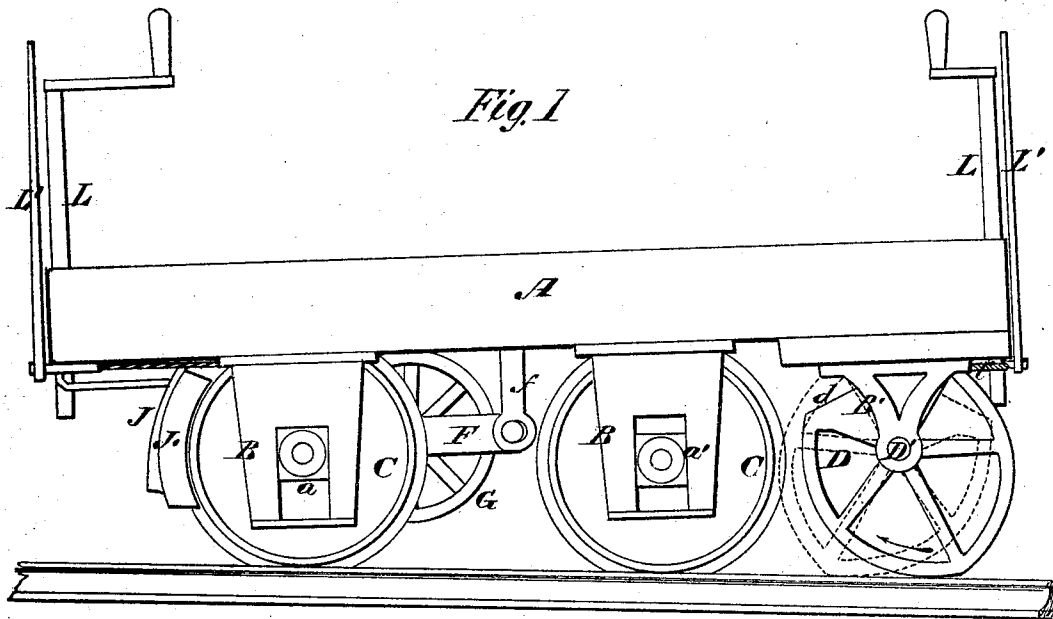


A. WHITTEMORE.
Car-Starters.

No. 145,468.

Patented Dec. 9, 1873.



Witnesses:
J. M. Wagner,
George E. Upham,

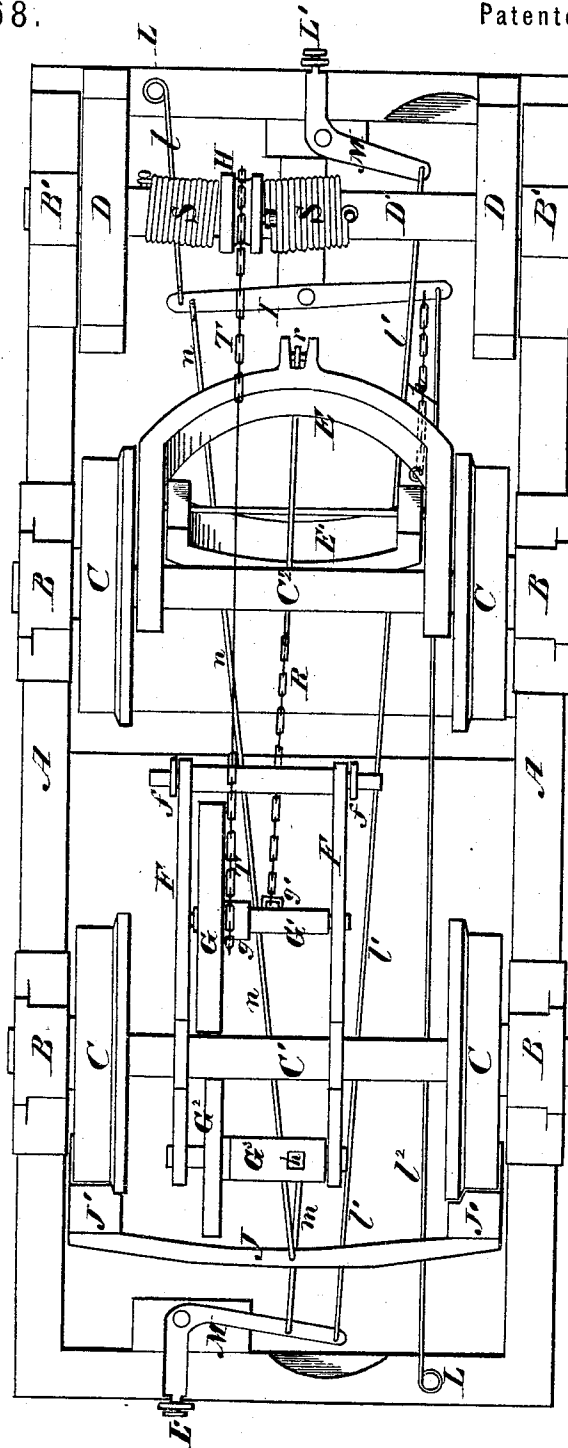
Inventor
Amos Whittemore,
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Fig. 3



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UNITED STATES PATENT OFFICE.

AMOS WHITTEMORE, OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **145,468**, dated December 9, 1873; application filed October 16, 1873.

To all whom it may concern:

Be it known that I, AMOS WHITTEMORE, of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented a new and valuable Improvement in Car-Starters; and I 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 side view of my apparatus for starting cars. Fig. 2 is a sectional view of the same. Fig. 3 is a plan view of the same.

This invention relates to certain novel improvements on the street-car starter for which Letters Patent of the United States were granted to me, bearing date on the 24th day of June, 1873. The object of my present invention is to more effectually carry out the general principle, set forth in said Letters Patent, of starting a car by the use of rolling eccentrics, which, when they are brought down upon the rails, by lifting one end of a car in the act of stopping it, will, when the brakes are released, start the car forward with a force which is proportionate to the weight in it. The nature of my invention consists, first, in providing for lifting one end of a car in the act of stopping it, in combination with starting-eccentrics, which are held in close contact with the track-rails by means of a winding-up mechanism acting on springs which are applied on the axle of the eccentrics, the lifting mechanism acting independently of the starting mechanism, as will be hereinafter explained; second, in providing the lifting mechanism with means which will actuate the brakes and stop the car at the moment that one end of it is lifted to its proper height to bring the starting-eccentrics into full play, as will be hereinafter explained; third, in a rotating lifting-wheel combined with a wheel which is applied on an eccentric shaft, having their bearings in a frame on one of the car-wheel axles, and actuated by levers and connecting-rods, for the purpose of bringing the eccentrics down upon the rails, and then winding up a chain which is connected to a lifting toggle-frame, whereby the car can be lifted by the

driver from either end by simply shifting a lever.

The following is a description of my invention.

In the annexed drawings, A represents the bed of a street-car, and C are the car-wheels thereof. Two of the wheels C are applied on an axle, C², the journal-boxes *a' a'* of which are received into vertically-oblong slots in brackets B B, which allow one end of the car to be raised without raising the wheels of axle C² off the track-rails. The wheels of axle C¹ have their bearings in journal-boxes *aa*, which are applied in brackets B B in the usual well-known manner. E represents a strong lever-frame, which is allowed to play freely on the axle C², and to which, at *e'*, another lever-frame, E', is pivoted. The upper ends of the frame E' are pivoted, at *e*, to the car-bed. The levers E E' constitute a toggle-frame for lifting the end of the car nearest them. The upper end *r* of the frame E is connected, by means of a chain, R, to a shaft, G¹, of a lifting-wheel, G, which shaft has its bearings in a frame, F, that is allowed to receive a slight longitudinal movement. One end of the frame F is loosely connected by a cross-bar to pendants *f*, which are secured to the car-bed A, and the other end of this frame affords bearings for an eccentric shaft, G³, on which a wheel, G², is allowed to turn freely. An arm, *h*, rises from the eccentric shaft G³, and is connected, by a rod, *m*, to a right-angular lever, M, which is vibrated by means of a lever, L', that rises vertically at one end of the car. The lever M is connected to a corresponding lever, M, at the opposite end of the car by means of a rod, *l*, and this latter lever is actuated by a vertical lever, L'. By means of either one of the levers L', the driver can oscillate the eccentric shaft G³, and cause the two wheels G G² to bind tightly against the axle C¹ of the car-wheels, so that by the revolution of this axle the wheel G will be turned, which will wind chain R on its axle G¹, and cause the toggle-frame to lift one end of the car, as shown in Fig. 1. If the lever L', which was moved to lift the car, be released, the pressure of wheels G G² on axle C¹ will be relieved, and the car-body will descend to its normal position. If desired, suitable means may be adopted for

locking the levers $L' L'$ when either one of them is adjusted for raising the car. $D D$ represent what I denominate "starting-eccentrics." These eccentrics are heart-shaped, and have flat surfaces d , which are held above and parallel to the track-rails when the car is not being raised or depressed. These eccentrics are keyed on an axle, D' , and arranged directly over the track-rails, so that their convex surfaces will bear on the rails, as shown in Fig. 1. The axle D' has its bearings in brackets $B' B'$, secured to that end of the car-bed which is raised and depressed in stopping and starting, and on this axle is applied loosely a chain-drum, H , which is connected, by right and left springs SS , to the axle, as shown in Fig. 3. The drum H receives around it an endless chain, T , which is passed around a spurred hub or drum on the shaft G^1 of the winding or lifting wheel G . $L L$ represent vertical brake-rods arranged at the ends of the car, and connected to the ends of a horizontal lever by chains $l l$. This lever I is connected by a rod, n , to a brake-bar, J , the brake-shoes $J' J'$ of which are applied so as to operate against the wheels of axle C^1 . The brake-lever I is also connected by a chain, p , to the upper end of the lever-frame E , which chain is of such length that when the free end of the car is raised to its full height the frame E will draw tight the chain p and forcibly apply the brakes $J' J'$.

It will be seen from the above description that the driver can apply or release the brakes from either end of the car without in any way interfering with the starting mechanism.

To operate the starting mechanism, the driver, standing at either end of the car, moves the lever L' nearest him and brings the peripheries of the wheels $G G^2$ in close contact with the axle C^1 . The wheel G , which is then rotated by said axle, moves the eccentrics $D D$ around so that they impinge on the track-rails. During this adjustment of the eccentrics the chain R will be wound around the axle G^1 of wheel G , and the end of the car carrying the eccentrics will be raised, leaving the wheels of axle C^2 on the rails. The car having been raised to its proper height and stopped by the chain p drawing the brakes against their wheels, the eccentrics will be held down on the rails, as in-

dicated in Fig. 1, by the chain T and one or the other of the springs S . When the driver desires to start the car he releases the lever L' , which he used in stopping the car, and thus frees the wheels $G G^2$ from axle C^1 , and allows the weight of the raised end of the car to rest wholly upon the eccentrics $D D$, which, being free to turn, cause the car to move forward with a force proportionate to the weight on these eccentrics.

It will be observed that, in applying the eccentrics to the rails during the act of raising one end of the car, they are brought around in opposite directions to the rotation of the car-wheels. It will also be observed that when the eccentrics are not in operation they are held free from the track-rails, with their flat sides $d d$ down, as shown in Fig. 2.

If desired, racks and pinions may be employed, instead of the endless chain T , for moving the eccentrics into working position; also, the wheels $G G^2$ may be spurred and engaged with a pinion spur-wheel on the axle C^1 .

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

1. The starting-eccentrics D on axle D' , combined with right and left springs $S S$, loose chain-drum H , chain T , and wheels $G G^2$ on a frame, E , substantially as and for the purposes described.

2. The lifting toggle-frame $E E'$, connected by a chain, p , to the brake-lever I , for the purpose of applying the brakes when the car has been lifted to its full height, all combined as and for the purpose described.

3. The chain R , connected to the shaft of the winding-up wheel G and also to the toggle-frame $E E'$, in combination with the chain T for operating the eccentrics $D D$, levers $L L' M M$, rod m , arm h , and the eccentric shaft of clamping-wheel G^2 , substantially as and for the purposes described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

Witnesses: AMOS WHITTEMORE.

J. B. LOOMIS,

GEORGE E. UPHAM.