

(No Model.)

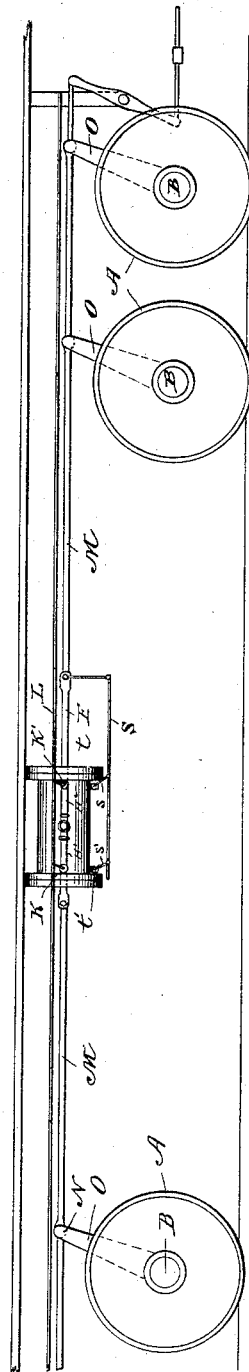
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E. H. MORGAN.  
CAR STARTER.

No. 422,888.

Patented Mar. 4, 1890.

Fig. 1.



Witnesses.  
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Fig. 2.

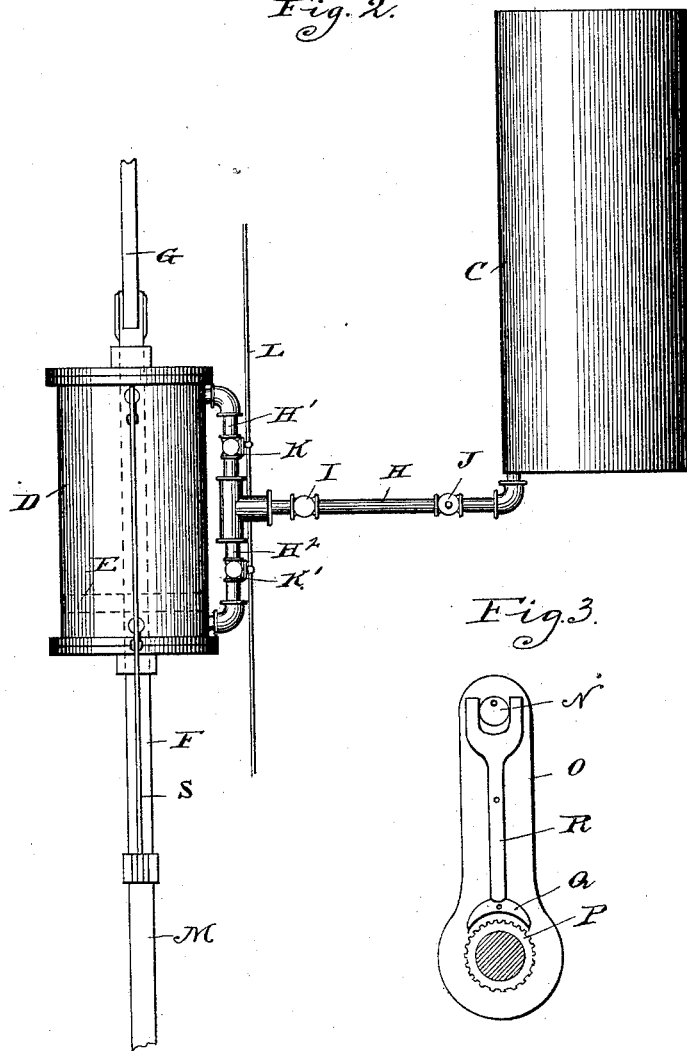
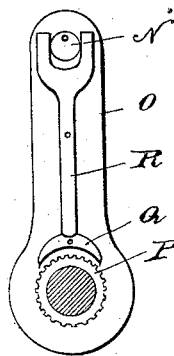


Fig. 3.



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# UNITED STATES PATENT OFFICE.

EVERARD H. MORGAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO LEVI P. WILCOX,  
OF SAME PLACE.

## CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 422,888, dated March 4, 1890.

Application filed June 28, 1889. Serial No. 315,894. (No model.)

*To all whom it may concern:*

Be it known that I, EVERARD H. MORGAN, a subject of the Queen of Great Britain and Ireland, residing at Chicago, Illinois, have invented certain new and useful Improvements in Car-Starters, of which the following is a specification.

This invention has for its object to utilize the exhaust from an air-brake system for the purpose of imparting a starting impulse to the car.

In carrying out my invention I employ a power-cylinder having therein a reciprocating piston whose rod is connected by means of suitable appliances—such as ratchet mechanism—with the axle, the power-cylinder being supplied with air under pressure from the reservoir of the brake system and conducted through suitable pipes and delivering by branches having valves therein upon either side of the piston at will, the valves being operated by shifting mechanism carried within reach of an attendant upon the car or of the engineer. When the brake is released under the present arrangement, the air is exhausted from the reservoir, and this air I utilize in order to reciprocate the piston and thereby impart a starting impulse to the car.

In the accompanying drawings, Figure 1 is a side elevation of the lower portion of a car, showing my improvements applied thereto. Fig. 2 shows the reservoir of the air-brake system and a bottom plan view of the power-cylinder which I employ, with its supply-pipes, valves, and piston-rods; and Fig. 3 is a detail view, in side elevation, of a ratchet mechanism which I employ to rotate the axle.

A represents the car-wheels, and B the axles upon which they are mounted.

C, Fig. 2, represents the compressed-air reservoir of the ordinary air-brake system.

D is a power-cylinder, supported, preferably, beneath the floor of the car, and having therein the piston E, provided with rods F G, projected from opposite ends of the cylinder.

H is a supply-pipe communicating with the reservoir, and by means of the branches H' H<sup>2</sup> with the respective ends of the power-cylinder.

I represents a check-valve in the pipe H; J, a blow-off valve therein.

K K' represent valves in the branches H' H<sup>2</sup>, respectively, and these valves control the passage of the fluid-motor to the power-cylinder.

L is a shift-rod connected to said valves and extended to the ends of the car, where it may be operated by an attendant, or when connected to similar rods, with which the several cars of the train are provided, may be carried to the engine, from whence it may be operated to shift the valves.

Connected to the piston-rod are rods M, which are pivoted at their opposite ends to eccentric N, pivoted upon a suitable standard or bracket O, sleeved over the car-axle. The axle has keyed thereto a ratchet-wheel P, and a double-acting pawl Q is pivoted to the supporting-bracket O, and has each of its ends adapted for engagement with the teeth of the ratchet. This pawl is rocked upon its pivot by means of a lever R, pivoted between its ends to the support O, and having its upper end bifurcated to embrace the eccentric. It is apparent that a movement of the rod in either direction will cause the pawl to engage the teeth of the ratchet-wheel on the axle and thereby rotate the latter in the direction corresponding to the direction of the movement of the piston.

S is a jointed valve-rod connected at one end to the piston-rod and having arms s s', adapted to operate exhaust-valves t t' near the ends, respectively, of the power-cylinder. The eccentric-rods may be operated in conjunction with the valves to cause the ratchets to rotate the axles in either direction, either from the engine or by the attendant at the end of the car.

In operation, the brake having been set, when it is desired to start the car again, the brake mechanism will be released in the usual way, and instead of exhausting the reservoir into the atmosphere the air under pressure contained therein is conducted by the pipe described into the cylinder, the valves in the branches of said pipe being set correspondingly, and this air under pressure will cause the reciprocation of the piston, which, acting through the rod and ratchet mechanism described, will cause the rotation of the axle in a corresponding direction. The valves of the

branches of the supply-pipe are adapted to be set so as to prevent the passage of air under pressure to the power-cylinder, and in such case the air contained in the supply-pipe below the check-valve, being prevented from entering the power-cylinder, escapes through the blow-off valve described.

I do not limit my invention to precise details of construction or arrangement of parts, as it is evident that many of the mechanical features hereinabove described may be considerably modified.

The invention may be applied to a single car or to all the cars of a train.

I claim—

1. In a car-starter, the combination, with a reservoir to contain compressed air, of a power-cylinder communicating with the reservoir by a pipe having a check-valve and branches delivering to opposite ends of the cylinder, said branches having valves therein, a rod connected to the piston-rod, and a ratchet mech-

anism comprising a ratchet-wheel secured to the axle, a pawl adapted to engage the ratchet-wheel, and a lever adapted to actuate the pawl, said lever being connected to the rod attached to the piston-rod, substantially as described.

2. In a car-starter, the combination, with a compressed-air reservoir, of a power-cylinder, a supply-pipe having branches provided with valves and delivering into the cylinder near its respective ends, mechanism adapted to shift said valves to admit air to either side of the piston at will, a piston-rod and a ratchet mechanism actuated thereby, and means for shifting the ratchet mechanism to correspond to the shifting of the valves, whereby the axle may be rotated in either direction, substantially as described.

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Witnesses:

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