

(No Model.)

2 Sheets—Sheet 1.

J. A. CURRIE.
STREET CAR MOTOR.

No. 492,274.

Patented Feb. 21, 1893.

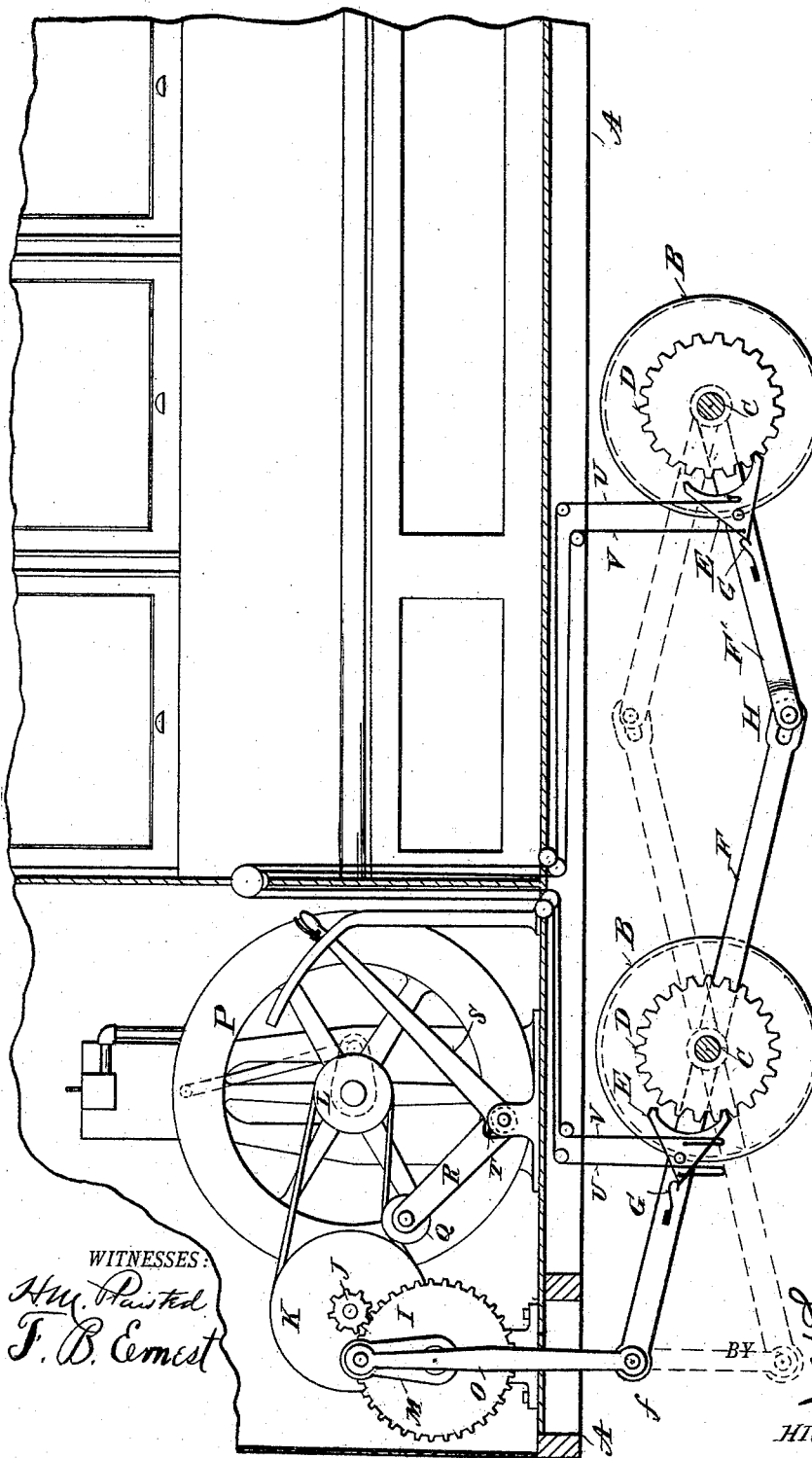


Fig. 1.

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J. B. Ernest

INVENTOR
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BY *H. A. Tiedman,*
HIS ATTORNEY.

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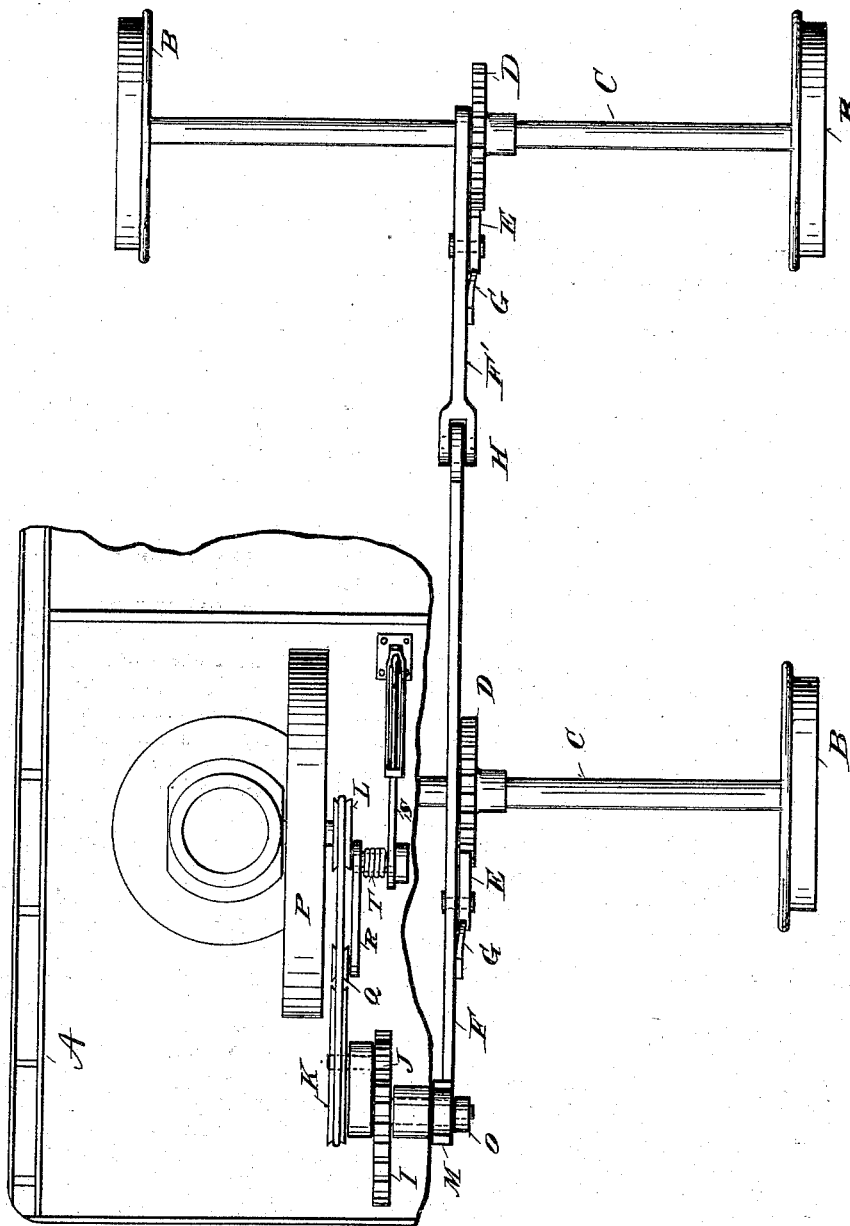


Fig. 2.

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UNITED STATES PATENT OFFICE.

JAMES A. CURRIE, OF SPRINGFIELD, OHIO.

STREET-CAR MOTOR.

SPECIFICATION forming part of Letters Patent No. 492,274, dated February 21, 1893.

Application filed June 10, 1892. Serial No. 436,205. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. CURRIE, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Street-Car Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in street car motors.

The object of my improvements is to provide means for multiplying the power of the motor, and to employ the momentum of the driving parts to start the car; to these ends my improvements have reference to a system of levers and interconnections between said levers and the driving mechanism; have reference to pawl and ratchet mechanism adapted to be reversed and drive the car in either direction; have reference to a driving wheel adapted to be driven at a high rate of speed and acquire sufficient momentum so that, when engaged with the driven mechanism, said momentum may be employed in the initial movement of the car; have reference to a spring connected or yielding tightening device to effect the engagement of said driving and driven mechanism; and have reference to other points hereinafter described and claimed.

In the accompanying drawings on which like reference letters indicate corresponding parts: Figure 1, represents a vertical longitudinal section of a portion of a street car with my operating mechanism applied thereto; and Fig. 2, a plan view of the same, portions of the car being broken away to show the construction of the mechanism.

The letter A designates the frame-work and body of a street car, the letter B, carrying wheels for the same, fixed to axles C. Toothed wheels D are also secured to said axles and are preferably of the form shown, adapted to allow of engagement in either direction by pawls E, having double arms, and pivoted to levers F F' respectively,—a spring G, or other means, effecting a normal engagement of one arm or the other of each pawl, and adapted to allow of changing the engagement of the pawls as will presently be described. These

levers are fulcrumed on the axles, so as to maintain the pawls concentric with the toothed wheels. They are engaged by a pin and slotted connection at H, or any other suitable manner, so that the force applied to the end of the lever F will be taken to the lever F' and transmitted to the rear pawl and wheel. The length of the levers is preferably such that the same amount of motive force is applied to each axle.

Integearing mechanism, consisting of a spur wheel and wheel I and pinion J, driven by a large pulley K, belted to a small driven pulley L, transmits the motive force to the levers by the crank M, to which the rod or pitman O is connected. The driving mechanism operating the driven pulley L, may be any suitable motor,—such as a gas engine,—provided with a fly wheel. P, the momentum of which is used in starting the car, as will presently be described. By this multiplication of the driving force, the operation of the car on a steep grade or under heavy load, is rendered possible. The pawls E drive the axles alternately, when in the location shown, the springs G allowing of the pawls ratcheting by the teeth on the up stroke when driving the car forward, and engaging and continuing the pressure on the downward stroke with a positive action. In Fig. 1, the forward pawl is about to begin its downward stroke, while the rear pawl is about to return.

The connecting cord or belt between the pawls K and L is slack, except when under the action of the tightening pulley Q, mounted on the arm R, engaged with the operating trip lever S, by a spring or other yielding connection T. This tightening of the belt will transmit the motion from the driving to the driven mechanism. In order to stop the car it is only necessary to slacken the belt, without stopping the engine. In starting the car, the fly wheel gives out its steady momentum to the driven mechanism when the trip lever S brings the tightening pulley into action. As is well known, the effort of starting the car is much greater than the power required to keep it running; by my device this difficulty is obviated, the stored up energy during the halt being delivered with full and increased power to the car axles. Thus not only is the

energy of the motor delivered to the mechanism with full power in starting the car, but said energy is multiplied in its transmission to the car axle by the intergearing and lever connections therewith.

In order to reverse the car, I propose to make the pawls E double as shown, and operate them in any suitable manner, such as by the cords U and V, preferably interconnected as shown, whereby the springs will act to keep the pawls in engagement at their other ends, and the same operation of the motor and intergearing connections, will drive the car backward instead of forward. Thus only the pawls are reversed and not the machinery. Any suitable operating means for said pawls may be provided, as I do not limit myself to the particular construction shown and described.

In the practical application of my improvements to street cars the levers F F' will be of considerable length, and the leverage exerted thereby increased in proportion. I have shown the car axles at a convenient distance apart to illustrate the principle and operation of the levers. I wish to be understood as laying broad claim to this lever and pawl engagement with the toothed wheels D, and as reversing mechanism for effecting the backward motion of the car. Also to the application of the momentum of the fly wheel to the initial motion of the car; also to the spring-connected or yielding tightening device between the driving and the driven mechanism. The shock of starting, when the rapidly rotating fly wheel is connected with the driven mechanism, is taken up and avoided by this yielding tightening device. The trip lever therefore may be thrown forward suddenly, bringing the spring-connected roller-bearing arm against the loose belt connection between the pulleys, without danger of breakage of the driven parts by the sudden transferring of the power thereto. It does not therefore depend upon the slipping of the belts for safety as is the case in other forms of tighteners, but the belt itself may assume a slack condition upon the pulley, and throw back the tightening roller Q according to the amount of the starting resistance.

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

1. A street car motor, the combination with the car axles, levers fulcrumed thereon, and means to engage said levers with said axles to effect the rotation thereof, of a driving wheel and means to rotate it to store up energy, and operative switch connections between said driving wheel and said levers, whereby the energy of the fly wheel may be applied to, or taken from, said levers.

2. In a street car motor, the combination with the car axles and toothed wheels mounted thereon, of levers fulcrumed on said axles, and interconnected double-armed pawls carried by said levers and adapted to engage with said toothed wheels in both directions, to effect a forward and backward movement of the car, and means to operate said levers.

3. In a street car motor, the combination with the car axles and toothed wheels mounted thereon, levers fulcrumed on said axles, the end of the forward lever being connected to the end of the rear lever, double-armed pawls carried by said levers and acting alternately on said toothed wheels respectively, to drive them forward, reversing means to effect the engagement of the other ends of the pawls to drive the wheels backward, and means to operate said forward lever.

4. In a street car motor, the combination with the car axles and toothed wheels mounted thereon, of levers fulcrumed on said axles, pawls carried by said levers and adapted to engage with said wheels and effect the rotation thereof, a driving pulley and driven pulley, a belt loosely connecting said pulleys, a tightening device to tighten said belt, and crank and intergearing mechanism between said driven pulley and said levers, to effect the operation thereof.

5. In a street car motor, the combination with a fly wheel and means to rotate it and store up energy, of a driving pulley connected therewith, a driven pulley and a belt loosely connecting said pulleys in normal position, and a tightening pulley, an arm supporting said pulley, a trip lever and a spring connecting said lever with said arm for the purpose described.

6. In a street car motor, the combination with a fly wheel and means to rotate it and thus store up momentum, of a driven pulley and a loose belt thereon operated through said fly wheel, a roller-bearing tightening arm, a trip lever, a spring connection between said lever and arm to act yieldingly on said belt, rotating axles and supporting car wheels, and interconnecting mechanism between said axles and said driven pulley, whereby the starting of the car will be assisted by the transferred momentum of the fly wheel, and the shock of starting avoided by the spring action of the tightening arm.

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

JAMES A. CURRIE.

Witnesses:

OLIVER H. MILLER,
H. M. PLAISTED.