

(No Model.)

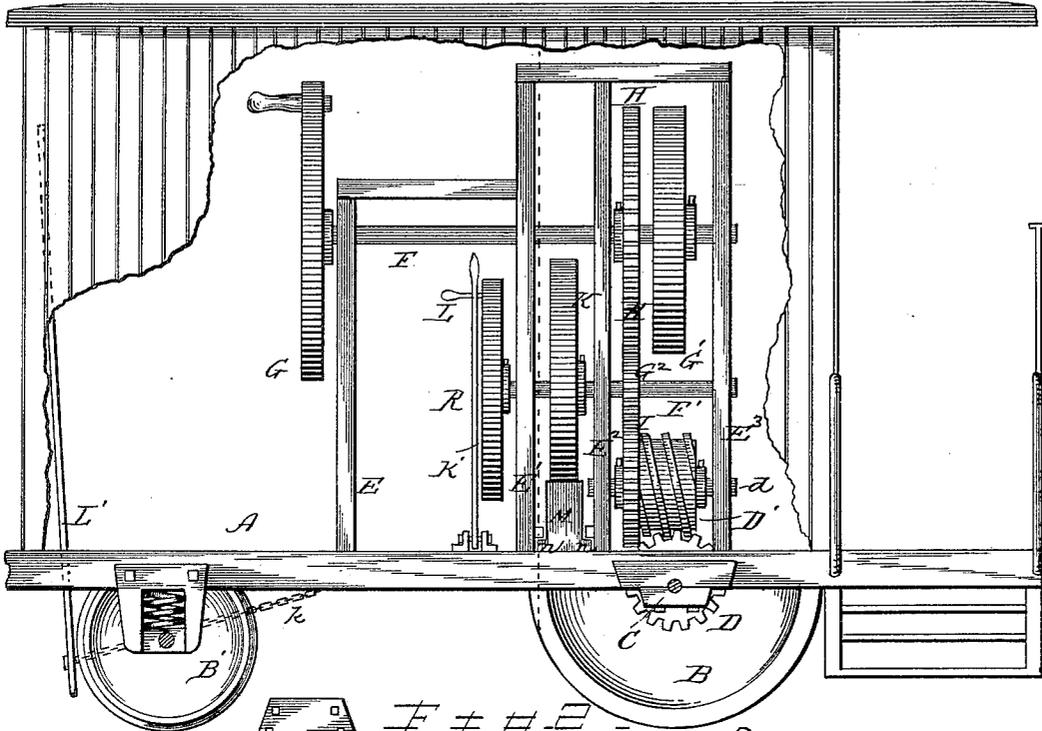
E. E. SENTMAN.

MOTOR FOR RAILWAY CARS.

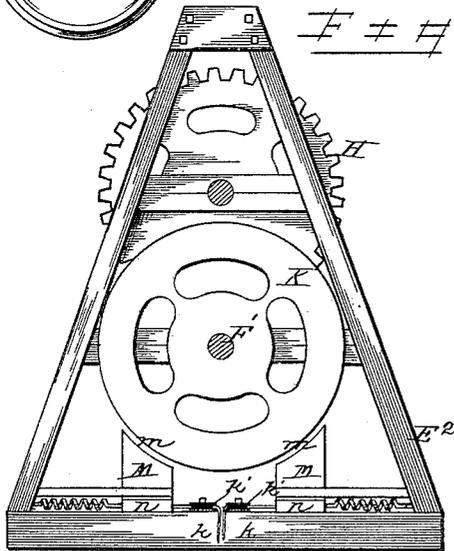
No. 399,572.

Patented Mar. 12, 1889.

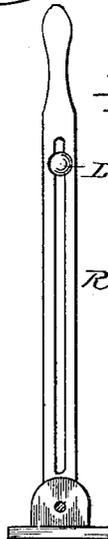
~~F # H - 1~~



~~F # H - 2~~



~~F # H - 3~~



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# UNITED STATES PATENT OFFICE.

EDWIN E. SENTMAN, OF PHILADELPHIA, PENNSYLVANIA.

## MOTOR FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 399,572, dated March 12, 1889.

Application filed June 12, 1888. Serial No. 276,803. (No model.)

### *To all whom it may concern:*

Be it known that I, EDWIN E. SENTMAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Motors for Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to motors for street-cars and other railway-vehicles, and has for its object the provision of novel mechanism whereby the propulsion of the car is effected through the medium of a worm-wheel on one of the axles and a worm included in an organized train of gearing and appurtenances constituting the motor.

My invention consists in the novel construction and combination of devices constituting the motor; also in the novel construction and combination of devices constituting a brake to stop the car by arresting the movement of the motor.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a motor-car containing my improved motor mechanism. Fig. 2 is a vertical transverse section of the same. Fig. 3 is an elevation of the starting-lever for general purposes, such as the propulsion of street-cars.

I intend to mount the motor on a separate vehicle, to which one or more passenger-cars may be coupled in any suitable way.

A designates the body of the motor-car, mounted on the wheels B B', secured to railway-axles C C'. Upon the axle C, about midway between the ends, is secured a worm-wheel, D, which is in mesh with and operated through the medium of a horizontally-arranged worm, D', fitted upon a shaft, d, which is journaled in the lower part of the motor-frame.

The motor-frame consists of a series of upright sections, E E' E<sup>2</sup> E<sup>3</sup>, in which are journaled the horizontal shafts F' F, which carry the principal gears, fly-wheels, and pulleys of the motor. The latter is to be operated either by hand or from a steam or other engine.

The main shaft F has mounted upon it the fly-wheels G and pulley G' at either end, and the spur-wheel H, the latter engaging with a pinion or idler, G<sup>2</sup>, upon the shaft F'. The worm D' has upon its shaft, or formed integral with its body, the toothed wheel I, with which the idler G<sup>2</sup> engages.

For the purpose of starting the shaft F' a slotted lever, R, fulcrumed or pivoted upon the floor of the car, is employed. The crank pin or arm t passes through the slot t' as the wheel turns. Rotary motion is thus imparted to the worm and through it to the car-axle C and wheels B from the main shaft F by turning the crank fly-wheel G, the momentum of which is increased by the fly-wheels. Motion may also be imparted through the shaft F' direct, which has mounted upon it the fly-wheels K K', of which K' is provided with the crank-handle L. In starting, the motor power should first be applied to the shaft F', as the leverage through the same is more direct and effective than through the main shaft, while the resistance to be overcome at the starting is the greater.

M M designate sliding brake-shoes, having segmentally-curved faces m m and lateral base-flanges n n. These shoes are located between the uprights E' E<sup>2</sup> and below the fly-wheel K, against the periphery of which they are intended to impinge in braking or stopping the motor. They are arranged, respectively, on opposite sides of the wheel K', and are drawn toward the wheel by means of chains k', passing around pulleys k<sup>2</sup> and connected to a brake-lever, L'.

NN are retracting-springs connected to the back portions of the brake-shoes for withdrawing them when the brake-lever is reversed.

o o are flanges or guides, under which the flanged portions of the shoes slide. When the motor is used in connection with steam or other equivalent power, the pulley G' will serve to receive the belt.

By the use of the worm and worm-wheel very great leverage and propelling-power is obtained, while the operation of the motor will be rendered smooth and even. The gearing may be proportioned so as to obtain any de-

sirable speed, while the use of the two power-shafts permits of the substitution of power for speed, or vice versa.

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

1. In motors for cars, the combination, with the driving-axle C of the car and the worm-wheel D, mounted thereon, of a train of motor-gearing for communicating motion to said axle, the same comprising the main and supplementary shafts F F', arranged at right angles to the axle and geared together and to the worm-shaft, each shaft being provided with an independent motor-crank, substantially as described.

2. In motors for cars, the combination, with the driving-axle C, of the worm-wheel D, mounted thereon, the worm D', engaging with said worm, the toothed wheel I upon the worm-shaft, the pinion or idler G<sup>2</sup>, the main and supplementary motor-shafts F F', the former carrying the gear-wheel H, the fly-wheel G, and pulley G', and the latter carrying the

idler G<sup>2</sup> and fly-wheels K K', substantially as described.

3. In a motor for cars, the combination, with a shaft, F', of said motor, and a fly-wheel, K, mounted thereon, of a pair of horizontally-movable brake-shoes, operating-chains connected therewith and passing over pulleys, a brake-lever to which said chains are connected, and suitable retracting-springs attached to said shoes, substantially as set forth.

4. In a motor for cars, the combination, with the motor-gearing train comprising the supplementary power-shaft F', carrying the crank-pulley K', of the slotted starting-lever R, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of June, 1888.

EDWIN E. SENTMAN.

Witnesses:

SAML. F. FLOOD, Jr.,  
SAMUEL F. FLOOD.