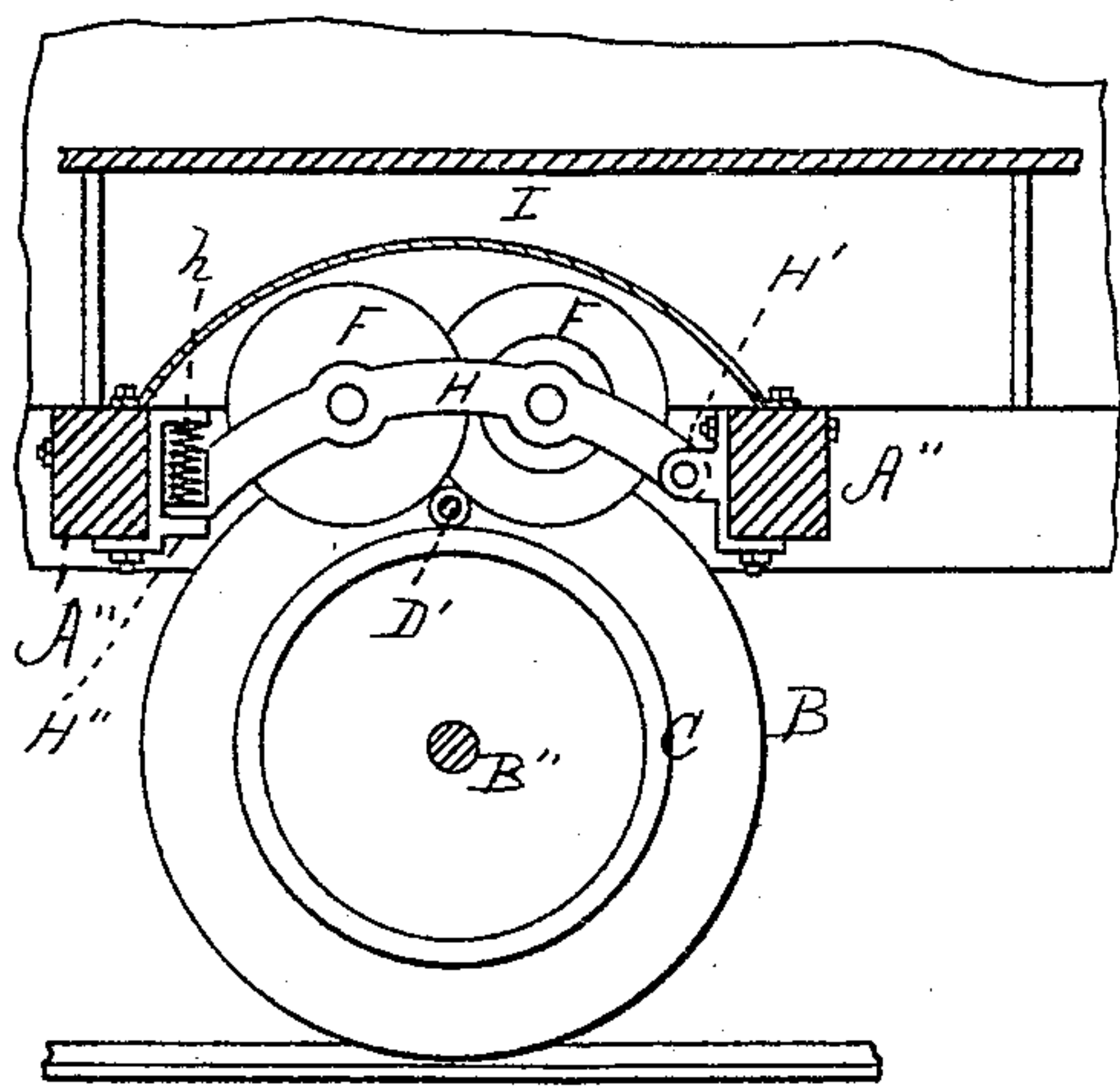
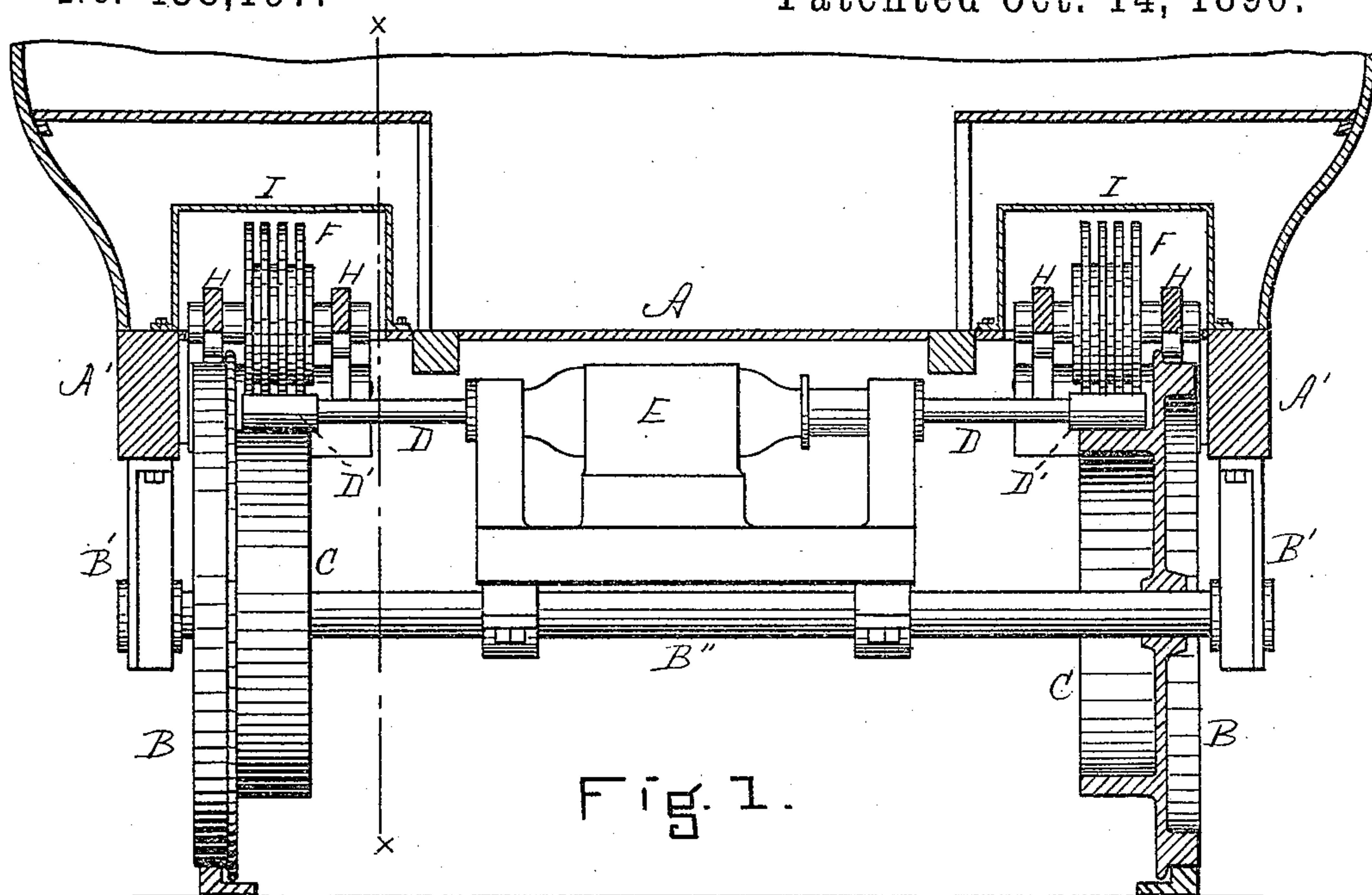


(No Model.)

O. C. SMITH.  
GEARING FOR MOTOR CARS.

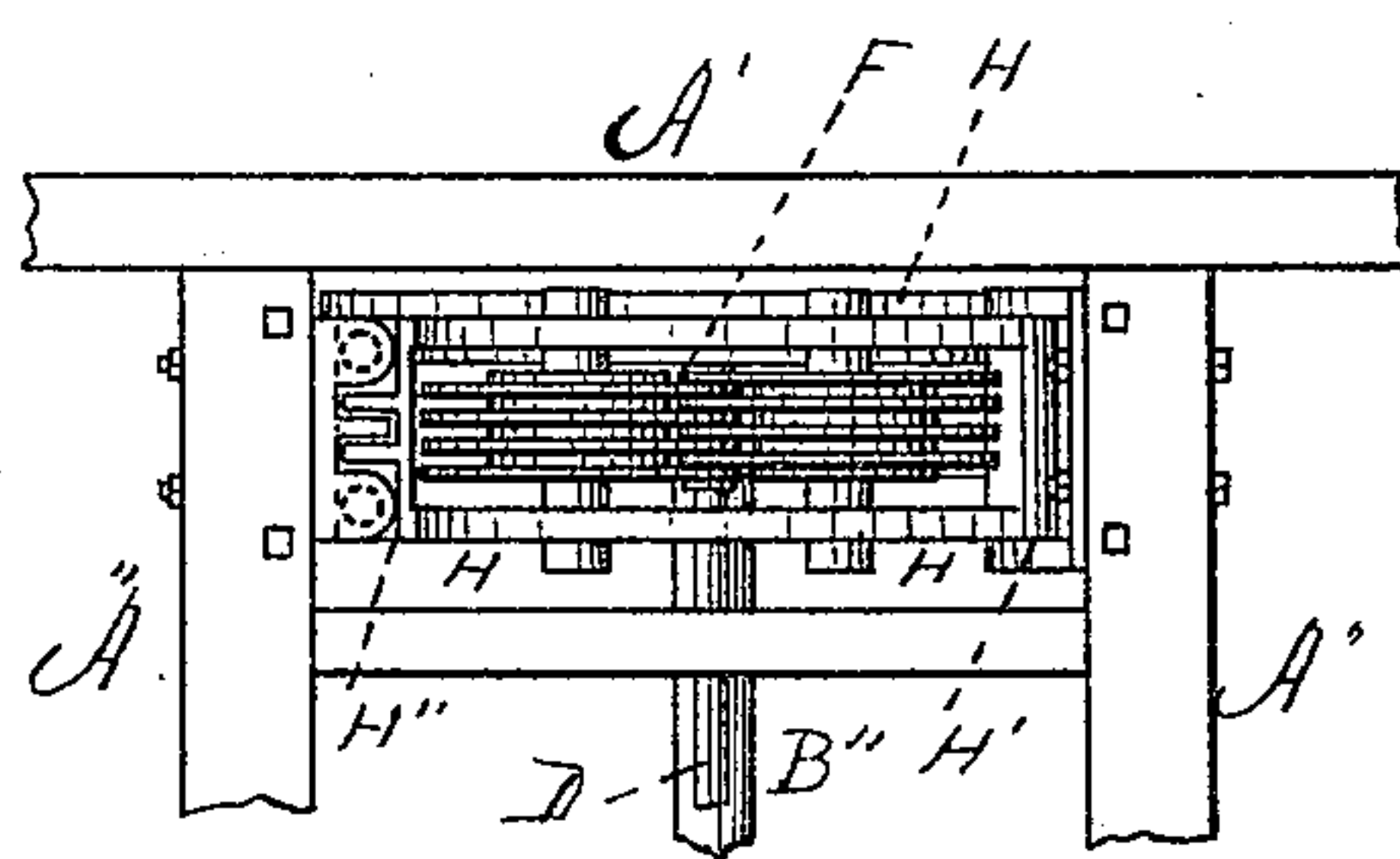
No. 438,197.

Patented Oct. 14, 1890.



WITNESSES.

J. M. Hartnett.  
A. J. Martin.



INVENTOR.

Oliver C. Smith,  
By his Atty.  
Spencer Williams.



# UNITED STATES PATENT OFFICE.

OLIVER C. SMITH, OF IPSWICH, MASSACHUSETTS, ASSIGNOR TO THE ELECTRIC  
RAPID TRANSIT COMPANY, OF NEW HAMPSHIRE.

## GEARING FOR MOTOR-CARS.

SPECIFICATION forming part of Letters Patent No. 438,197, dated October 14, 1890.

Application filed December 26, 1889. Serial No. 334,995. (No model.)

*To all whom it may concern:*

Be it known that I, OLIVER C. SMITH, of Ipswich, in the county of Essex and State of Massachusetts, have invented a new and Improved Device for Driving Cars and Locomotives by Electric Motors, of which the following is a specification.

The nature of the improvement is fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a transverse section of the lower portion of a street-car with my invention applied thereto, one of the wheels and the device itself being shown in elevation. Fig. 2 is a vertical section on line *x*, Fig. 1. Fig. 3 is a plan view of the invention.

Similar letters of reference indicate like parts.

A represents the floor of a car, A' A'' being timbers forming a part thereof or supporting the same.

B B are the wheels, B' B' the boxes, and B'' the shaft, all constructed substantially as usual.

On the inside of the car-wheel a wide annular rim C is cast, on which lies the end D' of the motor-shaft D, which is operated by an ordinary electric motor E, secured to the car in any desired manner.

On the top of the motor-shaft a pair of friction-wheels F bear, the same being journaled in a vibrating frame H, supported by the car-timbers or truck-frame. One end of this frame H is pivotally secured at H' to the car, while the other end is held by a guide H'' and rests on springs *h* to accommodate the vertical motion of the car. By means of this device the entire weight of the car and passengers rests on the motor-shaft and holds it against the rim C on the car-wheel with great power, thus imparting motion to the wheels.

The car is fitted up with boxes B' in the ordinary manner to keep the axles in their correct positions; but the springs may be omitted therefrom or made of sufficient strength to sustain such part of the load as is not necessary to drive the car. The friction-wheels

are made large in diameter and interlock, as shown, in order that their journal-centers may be brought as near together as desired, so that the frame H in vibrating will not bring said wheels down far enough to strike the rim C, which they might do if set too closely. The end D' of the motor-shaft may be of relative diameter to give any desired speed to the motor and car. Thus it will be seen that the rattling of gear-teeth, as in spur-gear, is avoided and the friction of moving parts reduced to a minimum, as are also the cost and weight. The friction is taken off from all the fast-moving bearings and is not doubled up, as it is in a train of spur-gear.

A simple housing I is placed over the wheels F.

It will be seen that in this device the power has to overcome no friction except that of the weight rolling on the wheels. In this it differs from previously-granted patents. In the Patent No. 51,098, granted November 21, 1865, the wheels N do not support the load. In the device patented January 9, 1877, No. 186,035, the friction is applied by a screw. In the device patented February 19, 1889, No. 378,207, the friction is applied by levers. In all these three inventions the friction is on the journal of the friction (small) wheel. In my device the friction is a rolling friction.

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

1. In a device for driving cars or locomotives by an electric motor, the combination, with the car-wheels and motor, of a motor-shaft supported by the car-wheels and supporting the weight of the load, substantially as set forth.

2. In a device for driving cars or locomotives by an electric motor, the combination, with the car-wheels and motor, of a motor-shaft supported by said car-wheels and friction-gear between said shaft and the car, substantially as described.

3. In a device for driving cars or locomotives by an electric motor, the combination

of the car-wheel provided with the flange C, the motor-shaft D D', friction-wheels F F', and motor, substantially as set forth.

4. The vibrating frame H, hinged at one end  
5 to the car and supported at the other end by a spring, in combination with the friction-wheels, substantially as described.

5. In combination with the motor-shaft and

flanged car-wheel, the friction-wheels F F', interlocking, as shown, substantially as set forth.

OLIVER C. SMITH.

Witnesses:

HENRY W. WILLIAMS,  
J. M. HARTNETT.