

(No Model.)

A. C. MILLER.  
ELECTRIC CAR BRAKE.

No. 489,972.

Patented Jan. 17, 1893.

Fig. 1.

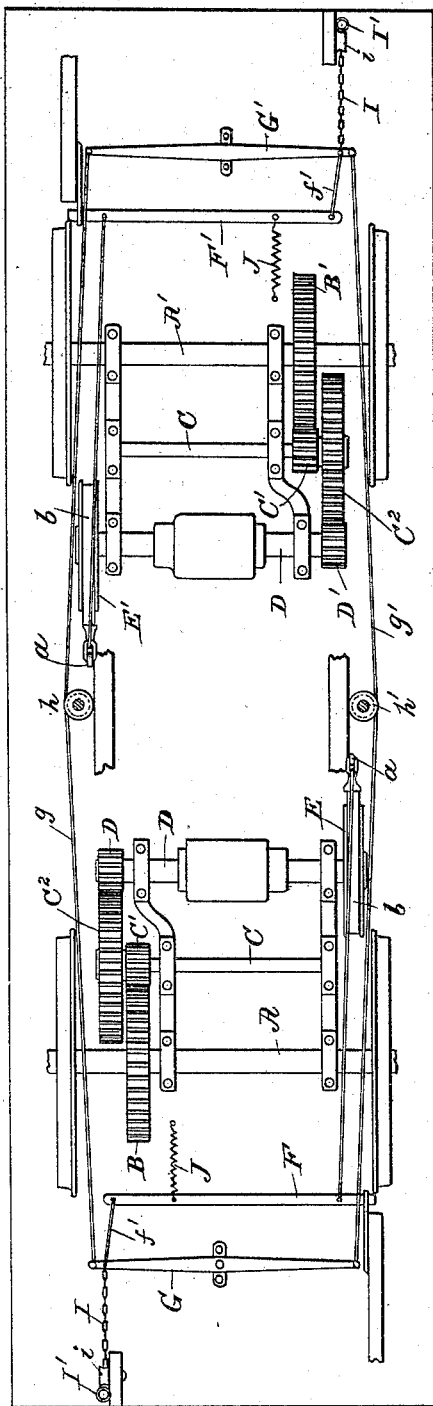
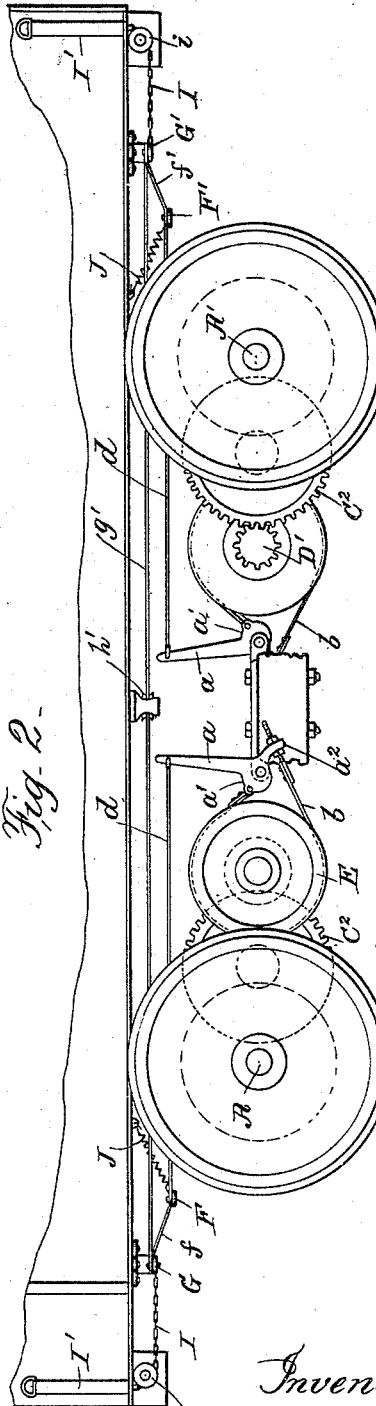


Fig. 2.



Attest { Geo. T. Smallwood,  
A. M. Bell.

Inventor:  
Andrew C. Miller,  
By A. M. Smith & Son  
Attorneys.

# UNITED STATES PATENT OFFICE.

ANDREW C. MILLER, OF AUBURN, NEW YORK.

## ELECTRIC-CAR BRAKE.

SPECIFICATION forming part of Letters Patent No. 489,972, dated January 17, 1893.

Application filed November 30, 1891. Renewed August 17, 1892. Serial No. 443,300. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW C. MILLER, a citizen of the United States, and a resident of Auburn, county of Cayuga, and State of New York, have invented a new and useful Improvement in Electric-Car Brakes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to an improvement in car brakes and is especially designed to be employed in connection with cars which are propelled by an electric motor.

It consists in the combination with the armature shaft of an electric motor car, of the friction brake consisting of a flexible strap surrounding a drum or wheel on the armature shaft and having its ends pivotally united to a lever, which is pivoted to the truck frame, or other suitable point, and adapted to be operated by the attendant from either end of the car through intermediate connections; as hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a plan view of so much of a car gear, &c., as is necessary to show the application of my improved brake, and Fig. 2 is a side elevation of the same.

The truck may be of any construction usually employed in connection with an electric motor, preferably of the kind employing an open center for giving access to the motor, &c., and only so much thereof and of the car body are shown as is necessary to illustrate my improvement. The axles indicated at A, A', have spur gears B, B', secured to them, which engage pinions C', C', on transverse shafts C, each of which carries a spur gear C<sup>2</sup>, on one end, which, in turn, engages and is driven by a pinion D' on the armature shaft D of an electric motor, which may be of any usual or preferred form. These armature shafts are mounted in suitable bearings in the truck frame, and are provided, each, on the end opposite the pinion D', with a drum or flanged friction wheel E. Upon suitable supporting brackets on the truck frame are pivoted levers *a* and *a'*, one at each side, made in the form of a three armed lever, one of the arms *a* being shown made in the form of an ec-

centric, extending on the side adjacent to and in the same vertical, longitudinal plane with the drum E, and to this eccentric arm *a'* and a pendent arm *a*<sup>2</sup>, of the lever, the ends of a strap spring *b*, extending around the drum E, are attached, the arrangement being such that when the upper, actuating arm *a*, of the lever is vibrated toward the drum, the lower end of the strap or spring will be carried outward, or away from the drum, while, at the same time, the upper end of the strap will be drawn downward toward the lower end, thereby causing the strap to snugly grasp the drum and so to act with a firm frictional grasp for stopping the rotation thereof and of the armature shaft on which said drum is mounted. A reverse movement of the lever, *a*, serves to expand the arc of the spring strap and so to free the drum from its grasp.

The upper arm *a*, of the lever is connected by a rod *d*, with one end of a transverse lever F or F', fulcrumed at its adjacent end in a bracket *f*, secured either to the car body or to a suitable support on the truck, as may be preferred. The opposite end of this lever F is connected by a link *f'* with a transverse lever G or G', located, one at each end and pivoted, preferably, to the lower face of the car body. The outer ends of these levers G and G' are connected by rods *g*, *g'*, which may be guided by suitable pendent pulleys *h*, *h'*, in proper position to prevent contact with the gear and traction wheels, the arrangement being such that when either lever G or G' is operated upon, the other will be vibrated thereby, and through said levers, the brake levers *a* and *a'*, will be simultaneously operated for applying the brake straps *b*, *b'*, or releasing them from the drums E, E, on the armature shaft.

One end of each lever G or G', has a chain I connected with it and extending thence over a suitable guiding sheave *i* to the brake staff or handle at I', through which said levers may be operated in any usual manner for applying or releasing the brakes.

J, J, indicate springs, which may be of any suitable form and arrangement, for retracting the levers F and F' and relieving the brakes, after they have been applied and the brake staff has been released.

The arrangement of the connecting levers,

through which the brake levers F and F' are actuated, and also the form of the gearing connecting the armature shafts with the axles, may, of course, be varied, as these, in themselves, do not constitute my invention, which, as stated, relates to the specific means for applying the braking action to the armature shaft of the actuating motor, and thence through the connecting gears to the axles and traction wheels, thereby operating on the prime motor shaft instead of on the traction wheels, as ordinarily done.

It will be seen that the straps *b, b*, are supported by their actuating levers only, and are so arranged relative to the arms of the latter as to be wound snugly around the armature shaft drum, when acting as brakes, while a reverse movement of the lever expands the strap and so releases said drum, leaving it free to rotate. The described arrangement of the straps is important, as it enables me to apply the brakes with equal effect with the car moving in either direction and obviates the jerky action consequent upon attaching

one end of the strap only to the actuating lever, the other end being attached to a fixed point on the truck.

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

The combination in a car-brake mechanism of the drums or band wheels on the armature shafts of the electric motors, the strap-spring brakes surrounding said drums, the levers for operating said straps, both ends of said straps being connected to their respective levers, and the transverse levers and their connections with the brake staffs or handles, whereby the brake straps may be simultaneously operated from either end of the car, all substantially as described.

In testimony whereof I have hereunto set my hand this 24th day of November, A. D. 1891.

ANDREW C. MILLER.

Witnesses:

A. WOODRUFF,  
J. LAWRENCE PAUL.