

(No Model.)

H. B. NILES.  
ELECTRIC MOTOR.

No. 419,059.

Patented Jan. 7, 1890.

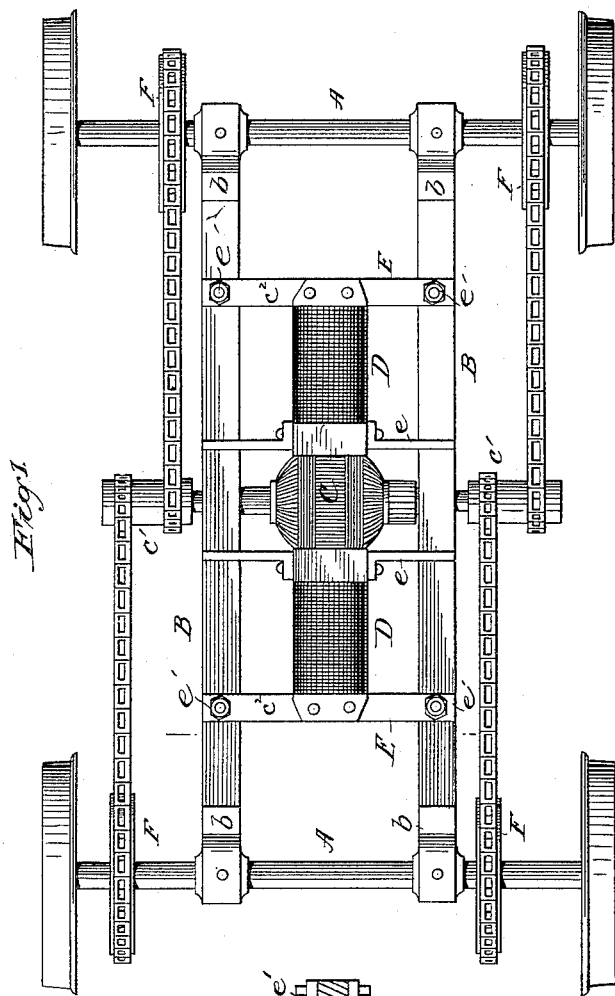


Fig. 1.

WITNESSES:

*Wm. Benjamin*  
*Wm. A. Rosenbaum*

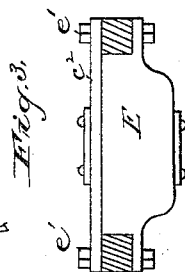


Fig. 2.

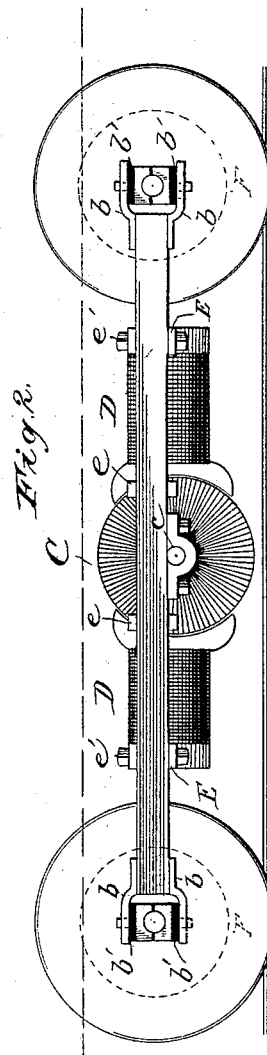


Fig. 3.

INVENTOR

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# UNITED STATES PATENT OFFICE.

HARRY B. NILES, OF UNION SPRINGS, NEW YORK.

## ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 419,059, dated January 7, 1890.

Application filed April 4, 1889. Serial No. 305,929. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY B. NILES, a citizen of the United States, residing in Union Springs, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Electric Motors, of which the following is a specification.

My invention relates to electric motors, the object being to provide a motor eminently adapted for electric-railway purposes.

The invention consists, generally, in a motor whose field-magnets are adjustable or removably secured to the car-track.

The invention also consists in the combination, with a car truck or body, of a particular form of motor and its particular manner of mounting therein, whereby I am enabled to utilize the largest possible diameter of armature with a view to driving the armature-shaft at a slow speed and gearing directly therefrom to the car-axes.

The invention also embodies details of construction which will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a plan of a car-truck and motor constructed in accordance with my invention. Fig. 2 represents a side elevation of the same, partially in section; and Fig. 3 represents an end view of a field-magnet, showing the manner of connecting it with the frame or truck.

A and A' represent the two axles of the vehicle or truck, which are connected together by two longitudinal iron bars or stringers B B. These bars are bifurcated at each end or fitted with detachable strips *b b*, which embrace and form a bearing for the axles. A rubber or spring cushion *b'* is interposed between the axle and each of the embracing pieces, in order to prevent injurious jarring of the mechanism supported upon the stringers B.

The motor consists of armature C and two field-magnets D. The armature is mounted upon the lateral shaft about midway between the truck. The shaft is journaled in boxes *c c*, secured to the under side of the stringers B. The shaft projects beyond its bearing on both sides and carries a sprocket-cylinder or two sprocket-wheels *c' c'*. Each field-magnet

consists of a single bobbin, which is supported upon the stringers B B by the lateral yokes E of soft iron, and *e* of brass. Referring to Fig. 3, these yokes are bifurcated at each end, and they embrace the two stringers B. The yokes *e* loosely embrace the stringers; but the yokes E are adapted to be secured thereto by bolts *e'* when the magnets are in their working position. By removing these bolts it is obvious that the whole magnet may slide along the stringers away from the armature. This construction will be found convenient when it is desired to examine the condition of the motor or to make small repairs.

To provide for the entire removal of a field-magnet from the truck, I have formed the yoke with a strip *c''*, bolted to one edge. When this strip is removed, the magnet may be withdrawn from the truck.

The shape of the pole-pieces and the style of the motor are such that I am enabled to utilize the greatest space between the bottom of the car (represented by dotted lines) and the road-bed. The lines of force from the pole-pieces are approximately horizontal and the upper and lower sides of the armature are therefore left uncovered—that is to say, no space at those locations is occupied by the pole-pieces and hence such space may be occupied by the armature. I am of course aware that the design of the motor taken as a whole is a common one; but so far as known to me it has never been proposed to use such a motor on a car-truck.

Referring now to the gearing, I run two endless chains from each end of the armature-shaft over large sprocket-wheels F on each axle. The strain upon the armature-shaft therefore is in two opposite directions, and the wear upon the same is lessened. Where high-speed motors are used, it is necessary to gear down from the armature-shaft and the axles, and this is the objection to such motors; but by using the large armature I am enabled to gear directly from its shaft to the axles, thus overcoming the great difficulty heretofore encountered.

As stated before, the stringers B and the yokes E are of soft iron, and inasmuch as the yokes are in electrical connection with the

stringers the magnetic circuit between the field-magnets is completed. The brass yokes *e* are simply used to support the bobbins, and being of a non-magnetic metal do not short-circuit the magnets. I therefore combine the magnetic circuit and the frame of the truck in a single structure, thus rendering the truck light and of fewer parts.

Having now described my invention, I claim—

1. The combination, with a vehicle-truck, of a motor-armature mounted in a stationary position thereon, and motor field-magnets mounted so as to be capable of movement to and from the armature.

2. The combination, with a vehicle-truck, of an electric motor, the frame of the truck serving as the magnetic circuit between the magnets of the motor, substantially as described.

3. The combination of a vehicle-truck, a frame supporting an electric motor, the motor-armature mounted in said frame, and the motor field-magnets mounted in ways one on each side of the armature and disconnected with each other, whereby the said magnets may be withdrawn from the armature, for the purpose described.

4. The combination, with two axles of a vehicle, of two stringers or frame-pieces B, connected therewith, an electric-motor armature mounted upon said stringers, and electric-motor field-magnets mounted to slide upon said stringers, substantially as described.

5. The combination, with a vehicle-truck provided with the iron stringers B B, of electric-motor field-magnets, and the iron yokes E E, electrically connected therewith.

6. The combination, with a vehicle-truck provided with the iron stringers B B, of elec-

tric motor field-magnets and the iron yokes E E, electrically connected therewith and adapted to slide thereupon.

7. The combination, with a vehicle-truck, of an electric-motor armature mounted therein, two field-magnets, bobbins also mounted therein and located on each side of the armature in a horizontal line, the pole-pieces of said bobbins standing upon opposite sides of the armature, thus leaving openings between the pole-pieces above and below the armature.

8. The combination, with the field-magnets, of the yokes E, having bifurcated ends, and the stringers B, for the purpose described.

9. The combination, with the field-magnets, of the yokes E, having the detachable strips *c*<sup>2</sup>, and the stringers B.

10. The combination, with the axles of a vehicle, of an electric motor, stringers B, in which said motor is mounted, said stringers being bifurcated at each end to embrace the axles, and the cushion or cushions located between the bifurcations and the axles, for the purpose described.

11. The combination, with a vehicle-truck, of an electric motor mounted therein, the armature of said motor being permanently mounted, and the field-magnets being arranged in a horizontal plane on each side of the armature and being mounted on ways or guides, so as to slide away from the armature and from each other, for the purpose described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HARRY B. NILES.

Witnesses:

WM. A. ROSENBAUM,  
F. C. GRUEN.