

(No Model.)

S. E. MOWER.
ELECTRIC MOTOR MECHANISM.

No. 463,639.

Patented Nov. 24, 1891.

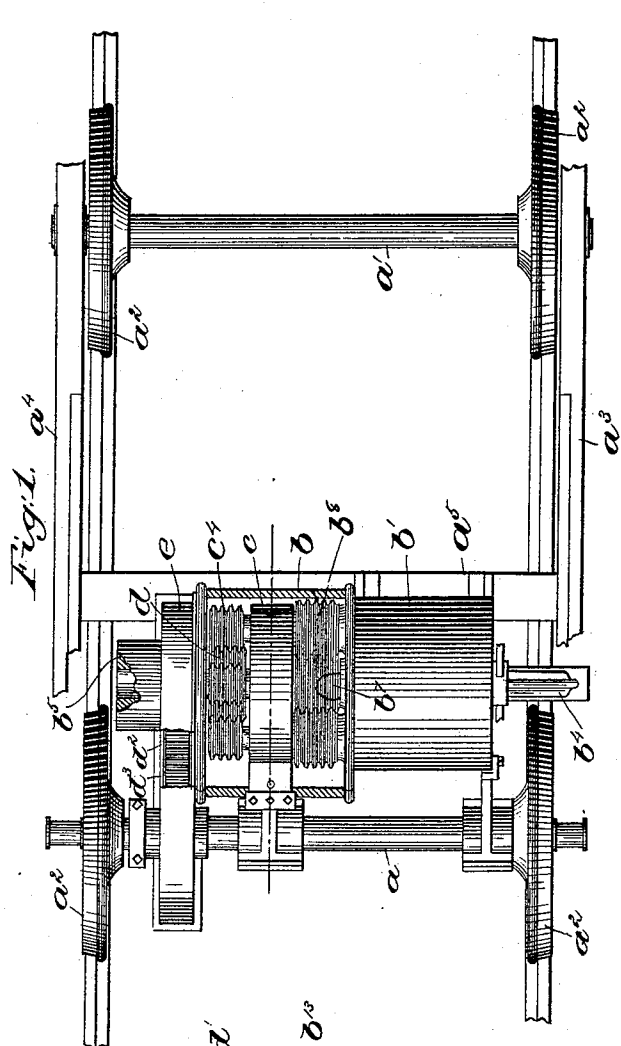


Fig. 1.

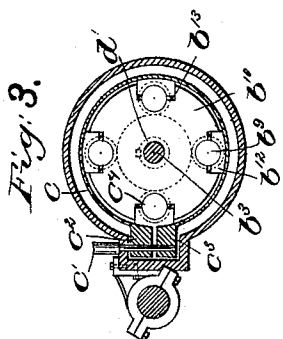
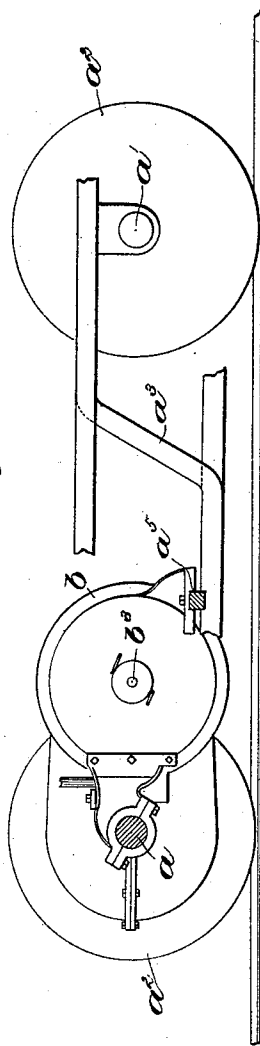


Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

SAMUEL E. MOWER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO HENRY G. THOMPSON & SONS, OF SAME PLACE.

ELECTRIC-MOTOR MECHANISM.

SPECIFICATION forming part of Letters Patent No. 463,639, dated November 24, 1891.

Application filed June 16, 1891. Serial No. 377,981. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. MOWER, of New Haven, county of New Haven, State of Connecticut, have invented an Improvement in Electric-Motor Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to rotate an axle or shaft by means of an electric motor independent of the axle and through the instrumentality of a speed-reducing mechanism, as will be described.

My invention is particularly applicable to the propulsion of electric-railway cars.

In accordance with my present invention the car-axle is revolved by means of a speed-reducing mechanism independent of the car-axle, but connected thereto, as will be described.

The particular features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 is a top or plan view of a sufficient portion of an electric car provided with my improved motor mechanism to enable my invention to be understood, the inclosing case for the speed-reducing mechanism being broken out; Fig. 2, a side elevation of the apparatus shown in Fig. 1; and Fig. 3, a sectional detail to be referred to, the section being taken on line *x x*, Fig. 1.

The car-truck, provided with the axles *a a'*, having wheels *a²*, may be of any usual or well-known construction such as now commonly employed, the said axles supporting, as represented, equalizer-bars *a³ a⁴*. The equalizer-bars *a³ a⁴* have secured to them a supporting-frame shown as a plank or bar *a⁵*, upon which rests one side or end of a case *b*, secured to the field-magnets *b'* of an electric motor, which may be of any usual or well-known construction. The motor is provided with the usual armature, (not shown,) having its shaft *b³* supported in suitable bearings *b⁴ b⁵*, herein represented as attached to the field-magnets and to the inclosing case. The armature-shaft *b³* is connected to one of the car-axles (herein shown as the axle *a*) by means of a speed-reducing mechanism, as will be de-

scribed. The armature-shaft, as represented, has keyed or otherwise made fast on it a friction gear or drum *b⁷*, provided, as shown, with annular peripheral teeth adapted to be engaged by annular teeth on a series of drums, gears, or wheels *b⁸*, fast on shafts *b⁹*, having bearings in a disk or drum *b¹⁰*, provided with movable portions or bearing-blocks *b¹²*, adapted to partially encircle the shafts, the said bearing-blocks being normally pressed away or removed from the shafts by springs *b¹³*. The disk *b¹⁰* and its bearing-blocks *b¹²* are encircled by a split ring or clutch-strap *c*, adapted to have its ends brought together, as represented by a threaded rod *c'*, extended through openings in arms *c² c³* on the strap or band *c*. The shafts *b⁹* on the side of the disk *b¹⁰* opposite to the gear *b⁸* have fast on them pinions *c⁴*, provided, as shown, with annular teeth, which engage like teeth on a gear or drum *d*, keyed or otherwise firmly secured on a sleeve *d'*, loosely mounted on the armature-shaft *b³*, the said sleeve having fast on it a gear *d²* in mesh with a gear *d³*, fast on the axle *a*. The friction-gears above described constitute the friction speed-reducing mechanism, and are inclosed within the case *b*, suitably supported by the axle and by the cross beam or plank *a⁵*. The gears *d² d³* are also inclosed within a suitable case *e*, also supported on the car-axle and secured to or forming part of the case *b*.

In operation the armature may and preferably will be run continuously, and while the car is at rest the ends of the clutch-strap *c* are forced apart by turning the rod *c'* in the proper direction, and when the said strap is relaxed, as described, the springs *b¹³* force the bearing-blocks *b¹²* away from the shafts *b⁹* and permit the latter to rotate freely and without producing rotation of the sleeve, the gear *d²*, fast thereon, and the gear *d³* on the axle *a*. If it is desired to start the car, the operator turns the rod *c'* in the proper direction to bring the ends *c² c³* of the strap toward each other until the bearing-blocks *b¹²* are brought in contact with and frictionally engage the shafts *b⁹*, thereby frictionally engaging the gears *b⁸*, with the gear *b⁷* fast on the armature-shaft, and the pinions *c⁴*, with the gear *d* fast on the sleeve. The rotation

of the armature-shaft and the gear b^7 , fast thereon, produces rotation of the shafts b^9 , and by means of the pinions c^4 the sleeve is rotated, the rotation of the sleeve producing rotation of the car-axle by means of the gears d^2 d^3 . The speed of rotation of the axle and of the car may be controlled by regulating the pressure of the bearing-blocks upon the shafts, which is effected, as shown, by turning the rod to bring the ends of the strap toward each other more or less.

I claim—

1. The combination, with an axle, of an electric motor independent of the axle, its armature-shaft having a sleeve loosely mounted on it and provided with a gear in mesh with a gear on the axle, and a speed-reducing mechanism connecting the sleeve to the armature-shaft, comprising a gear on the sleeve, a gear on the shaft, a disk or drum located between said gears and mounted loosely on the shaft, and gears and pinions borne by said disk, adapted to respectively engage the gear on the shaft and gear on the sleeve, substantially as described.

2. The combination, with a car-axle provided with a gear, of an electric motor, its armature-shaft having a sleeve loosely mounted on it and provided with a gear in mesh with the gear on the car-axle, and a friction speed-reducing gearing to connect the sleeve to the armature-shaft to be revolved thereby, consisting of a friction-gear fast on the armature-shaft, a friction-gear fast on the sleeve, a disk or drum intermediate and independent of the said friction-gears, shafts extended through said disk or drum and provided with friction-gears and pinions to engage the gears on the armature-shaft and sleeve, respectively,

and means for holding and releasing said disk or drum at will, substantially as described.

3. The combination, with an axle provided with a gear, of an electric motor, its armature-shaft, a sleeve loose on said armature-shaft and provided with a gear in mesh with the gear on the axle, a friction-gear fast on the armature-shaft, and a friction-gear fast on the sleeve, a disk or drum intermediate of said gears, shafts extended through said disk and provided with friction-gears and pinions to engage the gears on the armature-shaft and sleeve, respectively, movable bearing-blocks in said disk, a strap or band encircling said disk, and means to bring the said bearing-blocks into engagement with the shafts extended through the disk, substantially as described.

4. The combination, with an axle, of an electric motor independent of the axle, its armature-shaft having a sleeve loosely mounted on it and provided with a gear in mesh with a gear on the axle, and a speed-reducing mechanism connecting the sleeve to the armature-shaft, comprising a gear on the sleeve, a gear on the shaft, and an independent disk bearing two planetary trains, one in mesh with the gear on the sleeve and the other with the gear on the shaft, the wheels of said trains being of different diameters, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL E. MOWER.

Witnesses:

H. G. THOMPSON,
L. H. DAYTON.