

(No Model.)

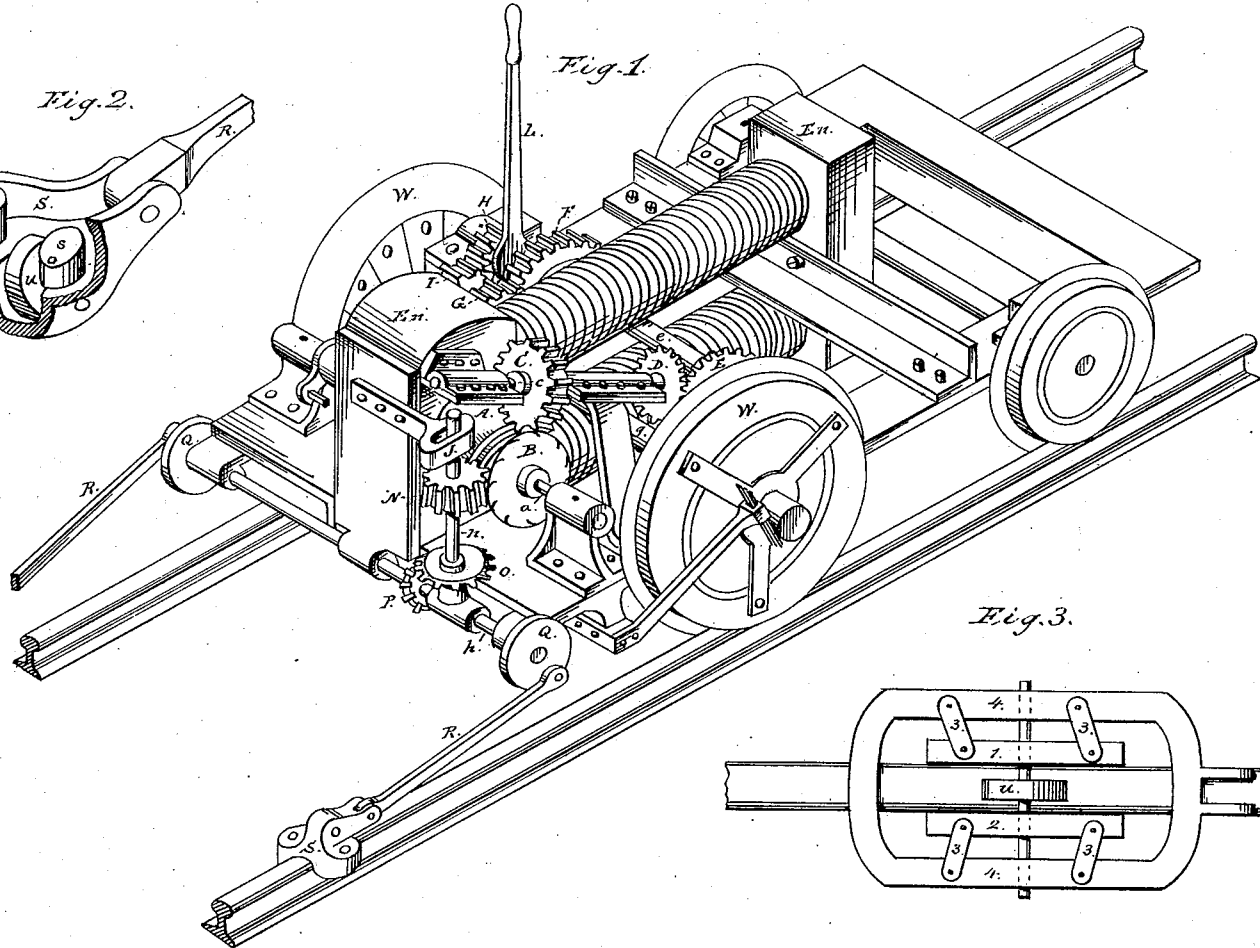
T. A. EDISON.

2 Sheets—Sheet 1.

ELECTRO MAGNETIC RAILWAY ENGINE.

No. 265,778.

Patented Oct. 10, 1882.



Attest,  
Charles Howard  
James W. Cooper

Inventor,  
T. A. Edison  
per *Myer & Miller*  
Attys.

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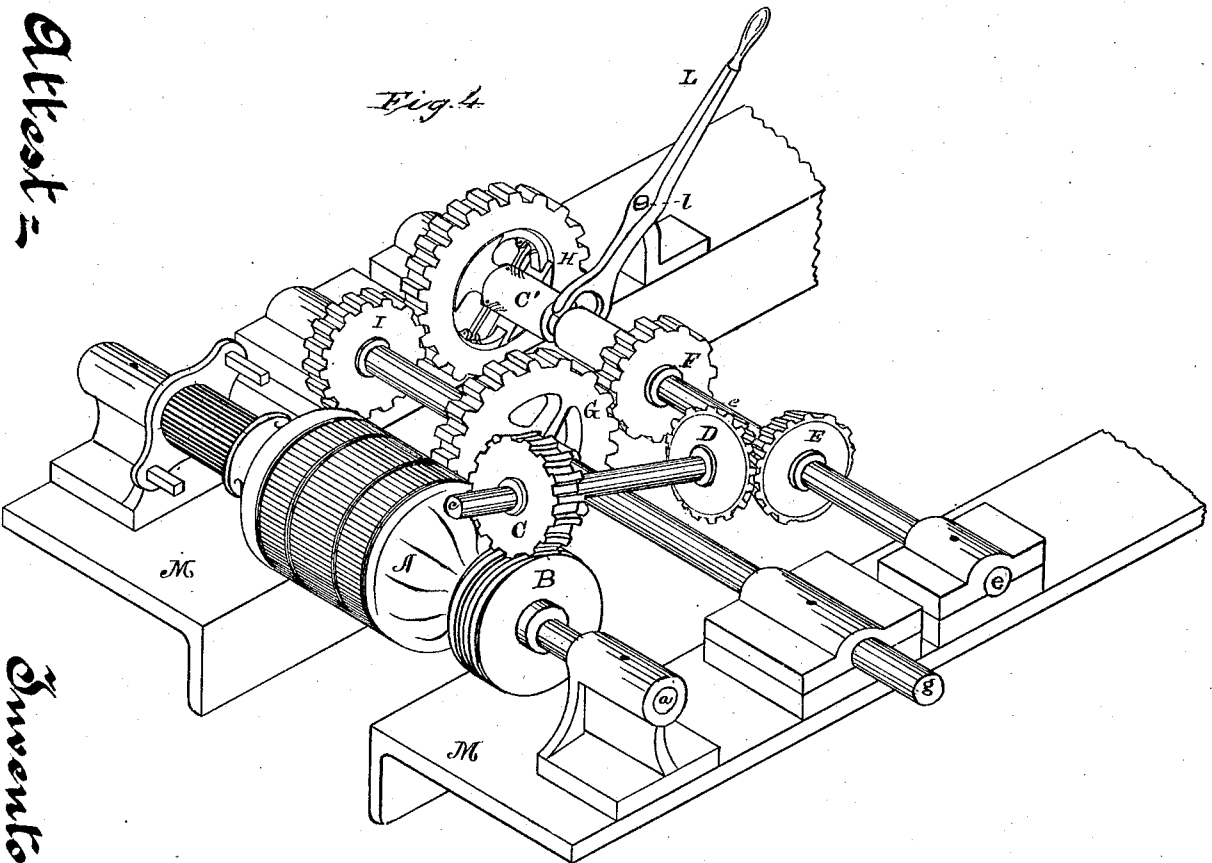


Fig. 4.

Attest =

J. D. Mott

James A. Bayard

Inventor =

Thos. A. Edison

per Bayard & Miller

Attys.

N. PETERS, Photodupliographer, Washington, D.C.

# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

## ELECTRO-MAGNETIC RAILWAY-ENGINE.

SPECIFICATION forming part of Letters Patent No. 265,778, dated October 10, 1882.

Application filed July 22, 1880. (No model.) Patented in England September 25, 1880, No. 3,894; in Canada March 31, 1881, No. 12,568; in India May 3, 1881, No. 341; in Victoria May 12, 1881, No. 3,012; in France May 27, 1881, No. 141,752; in New South Wales June 25, 1881; in Queensland June 30, 1881, and in New Zealand August 2, 1881, No. 542.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have made certain new and useful inventions in Electro-Magnetic Railway-Engines, (Case No. 223;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The invention relates to that class of devices for the propulsion of vehicles known as "travelers" or "creepers," which, reciprocated upon a rail, slide freely in one direction, but are locked to the rail upon attempted movement in the other direction.

The object is to furnish a device of this general type simple in construction, certain in operation, and arranged so that it may be thrown into or out of operation and into or out of operative position at will, and adapted to be used with the ordinary rails of an ordinary railroad-track; to which ends it consists in the features more particularly hereinafter described and claimed.

Upon a suitable frame-work supported on running-gear is mounted an electro-magnetic engine, whose rotating shaft is connected through intermediate mechanism to the driving-wheels, all as shown in my application for a patent filed June 3, 1880, and bearing serial number 11,243. Upon the rotating shaft of the engine is fixed a thread, with which gears a worm carried on a vertical shaft. This vertical shaft is mounted in adjustable bearings, so that the worm may be thrown into or out of gear with the thread, as desired. Upon the lower end of the vertical shaft is a bevel-gear meshing into a bevel-gear upon a horizontal shaft, to whose ends, by crank arms or pins, are attached rods, each carrying at its opposite end a box or casing provided with a central wheel which rides upon the rail. In the box or casing, so as to take upon the sides of the rail, are eccentrically pivoted two wheels, one on each side. These side wheels, being eccentrically pivoted, allow the box to be pushed forward along the side of the rail, but prevent retrograde motion by closing together and grasping the rail.

The arms carrying the grippers or creepers are mounted so that they may be let down upon or removed from the track, as occasion requires. Hence, as a rod is reciprocated from the motor through the gearing described it pushes forward during one half-revolution the box or casing which slides upon the rail. Upon the commencement of the other half of the revolution, by the action of the eccentrically-pivoted wheels or rollers, the box or casing is locked to the rail and the engine is pulled up. One only being used, the action would be a series of pulls and pauses; and, if desired, one only may be used, taken upon either rail or upon a central rail laid especially for this purpose. In practice, however, it is desirable to use at least two—one for each rail—with cranks so arranged relatively to each other that while one is being slid forward the other is holding, so that a continuous motion may be produced. Additional grippers or creepers may also be placed at the rear of the train, so that a continuous pulling and pushing action is produced. Instead of rollers within the box or casing referred to, another form of device may be used in order to give a larger gripping-surface. Within the box or casing are two bars parallel to the rail, one on each side. These bars are attached to the casing or box by loose toggle-joints in such way that upon motion forward of the box or casing the bars recede from the rail, but upon retrograde movement they approach and grip the rail.

The operation of these devices will be better understood by reference to the drawings, in which—

Figure 1 is a perspective view of an engine embodying a motor and a creeper or traveler. Figs. 2 and 3 are details of the creeper. Fig. 4 is a perspective view of the motor-gearing.

A is the rotating armature of the electric motor, mounted on shaft *a*, secured in suitable bearings. Upon the shaft *a* is a worm or screw, B, gearing into C on inclined shaft *c*, upon whose lower end is the bevel-gear D, by means of which and the other intermediate mechanism shown motion is communicated from A to the driving-wheels of the engine. Upon the front end of the engine-car is a shaft, *h*, on which is a sleeve supporting the lower end of a shaft, *n*,

whose upper end is secured in a bearing, J, which permits of a slight movement of the shaft *n*. Upon *n* is mounted a worm-gear, N, which may be made to mesh with the worm or screw B on the armature-shaft *a*. Upon and near the lower end of *n* is the bevel-gear O, meshing into a bevel-gear, P, upon shaft *h*, to whose outer ends are attached the arms R by means of cranks Q. The arms R are attached to the crank-shaft at diametrically-opposite points, so that they will move in opposite directions and impart a continuous motion to the car. These arms R are arranged with any simple lifting device, so that they can be let down upon or removed up from the rails.

Pivoted to R is a box or casing, S, in whose upper portion is a wheel, *u*, riding upon the top of the rail. Within S, and upon each side of the rail, wheels *s* are mounted eccentrically, pivoted as shown, the opening between them at the widest being just enough more than the width of the rail to permit its passage there-through. From this it is evident that if a body the width of a rail be slid between them in the direction of the arrow, Fig. 2, it will push them apart; but that if the motion be in the opposite direction it will cause the rollers *s s* to approach each other, gripping the body between them.

When necessary, the worm N is thrown into gear with B, motion being communicated thereby to the arms R. Upon the forward half of the movement the arm R pushes the box S along the rail. Upon the commencement of the latter half of the movement the rollers *s s* approach each other, gripping the track and locking the box or casing to it, whereupon the car is pulled up toward S.

Where the rails are light and might possibly be injured or indented, an alternative device (shown in Fig. 3) may be used, which gives a long grip upon each side of the rail-head. In this figure, 4 is a box or frame connected pivotally to R, and having the wheel *u*, as in the other form. Connected to 4 by toggle-joints 3 3 are the gripping-bars 1 2, one on each side. As seen, upon motion of the box or frame in direction of the arrow, on account of the toggles used, the bars 1 2 recede from the rail, but upon motion in the opposite direction approach

the rail, gripping it and locking the box or frame thereto.

Springs may be applied to the rollers *s s* or bars 1 2, so as to normally hold them to the rail with a light pressure, not sufficient to interfere with their sliding in one direction, but causing them to act instantly upon attempted motion in the opposite direction.

In the use of either construction shown it is evident that while in position upon the rails they may be caused to operate or be thrown out of operation by moving the shaft *n* in its upper bearing, the sleeve on *h*, forming its lower bearing, permitting such movement, while, when desired, the arms may be lifted up and secured in position away from the rails.

What I claim is—

1. The gripping mechanism for electro-magnetic engines, consisting of an open-bottomed box or casing and eccentric rollers or cam-plates pivoted to or secured within the box or casing upon opposite sides thereof, and adapted to approach each other upon movement of the box in one direction longitudinally and to recede from each other upon movement of the box in an opposite direction, substantially as set forth.

2. The combination, with an electro-magnetic railway-engine, of a crank-shaft revolved by connection with the motor, two reciprocating arms attached to such shaft at opposite points, so as to work oppositely, and grippers carried by such reciprocating arms and acting upon the rails of the road, substantially as set forth.

3. The combination, with the electric motor of an electric railway-engine, of an arm or arms reciprocated thereby through suitable intervening mechanism, and each carrying a creeper or traveler, as described, and means for connecting or disconnecting at will the arm or arms and the motor from each other, substantially as set forth.

This specification signed and witnessed this 3d day of July, 1880.

THOS. A. EDISON.

Witnesses:

FRANK McLAUGHLIN,  
SAMUEL EDISON.