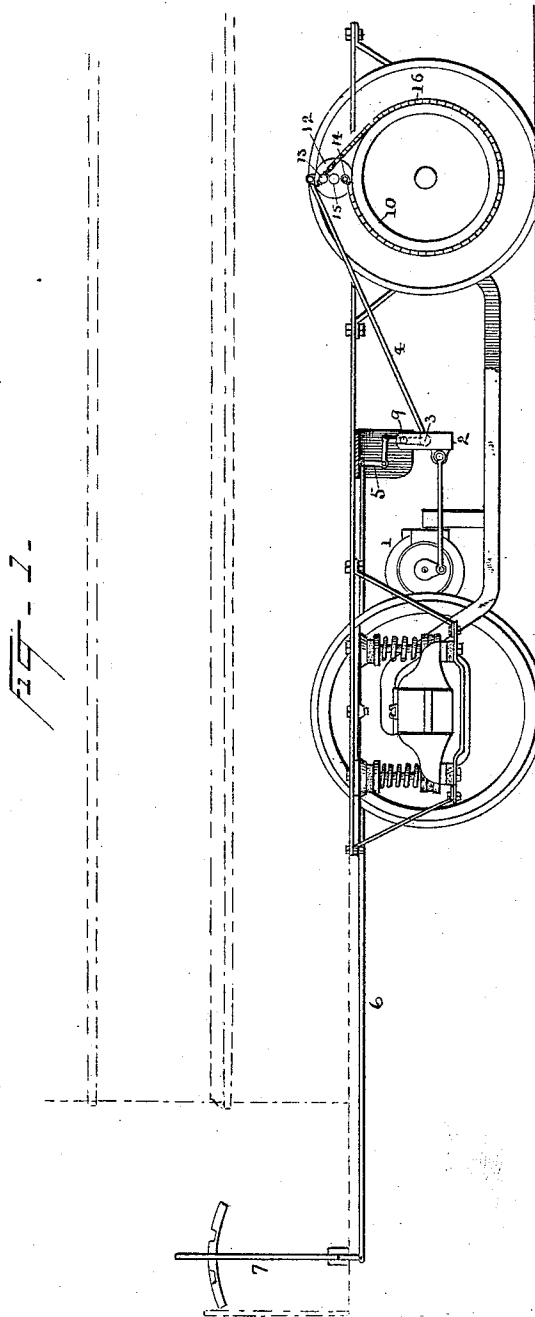


(No Model.)

3 Sheets—Sheet 1.

T. A. EDISON.
PROPELLING DEVICE FOR ELECTRIC CARS.
No. 437,428. Patented Sept. 30, 1890.



Witnesses
Horris A. Clark
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Inventor
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Lyert & Seely.

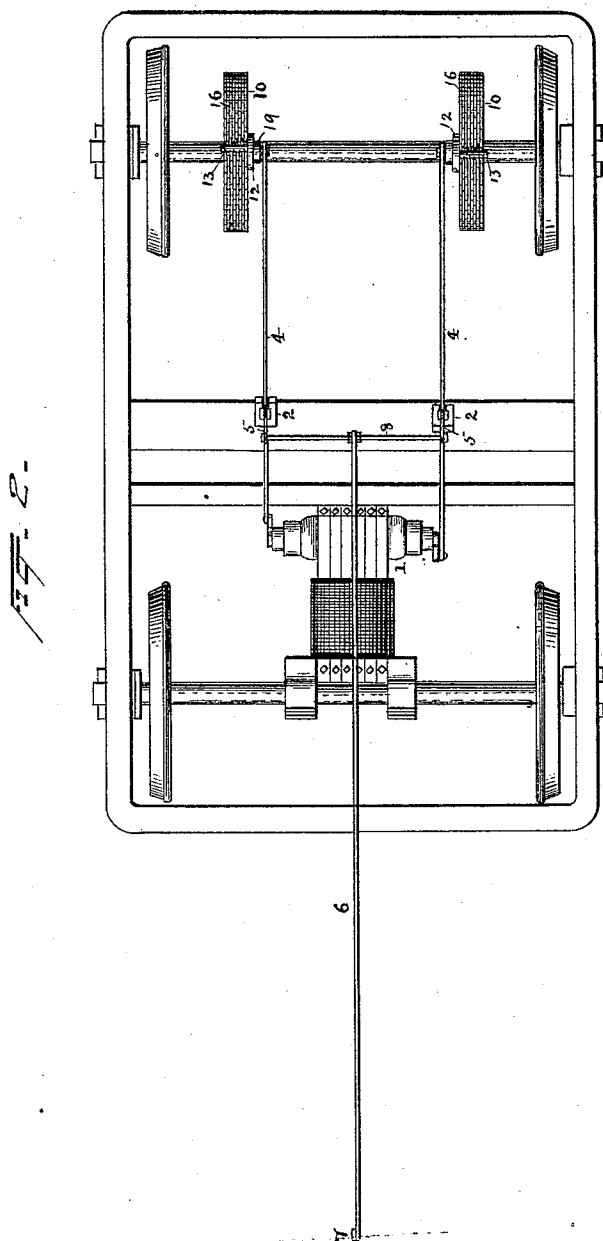
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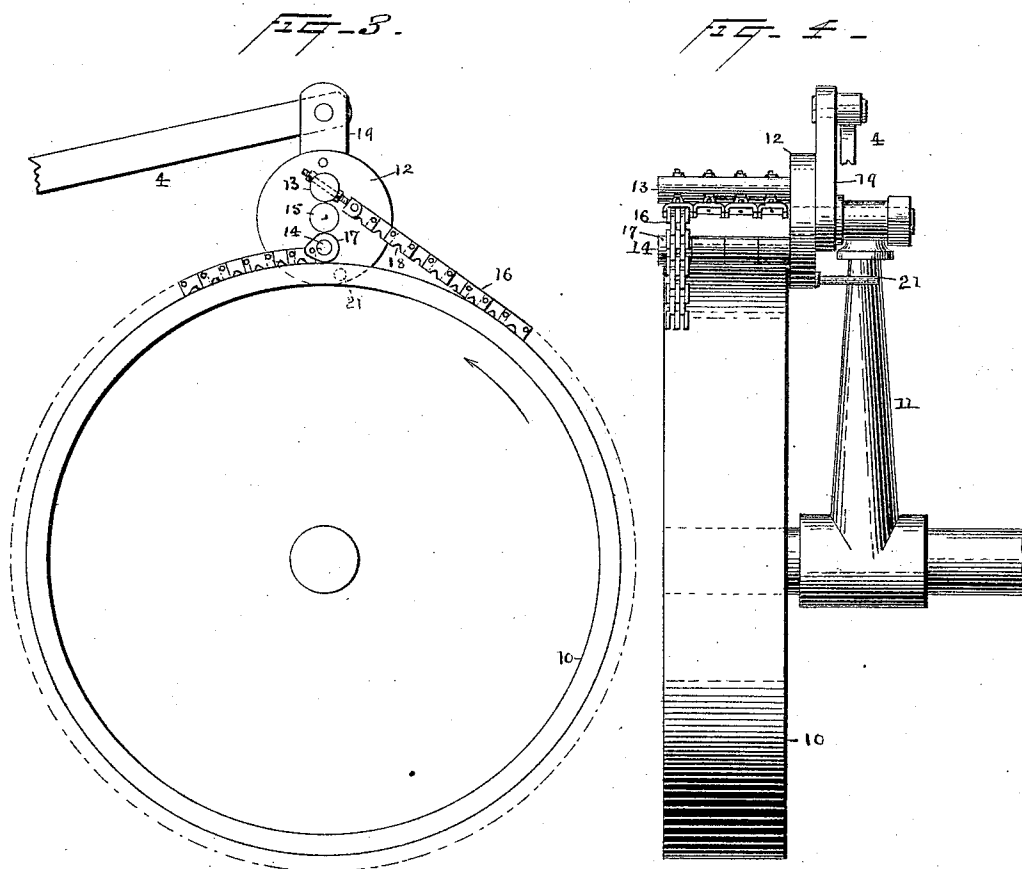
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UNITED STATES PATENT OFFICE.

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

PROPELLING DEVICE FOR ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 437,428, dated September 30, 1890.

Application filed May 5, 1890. Serial No. 350,612. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Propelling Devices for Electric Cars, (Case No. 858,) of which the following is a specification.

The object of the present invention is to produce an efficient means for transferring the reciprocating motion of the propelling mechanism to the axle of the car or to other axles or shafts.

The present invention constitutes an improvement on the apparatus claimed in my application Serial No. 341,108, filed February 20, 1890. Certain features shown in the drawings form the subject-matter of the application of John F. Ott, Serial No. 341,111.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side view of a car-truck with the improved propelling device attached. Fig. 2 is a plan view of the same. Fig. 3 is a side view, on a larger scale, of the clutch mechanism; and Fig. 4 is a view at right angles to Fig. 3.

Referring to Fig. 1, the electric motor 1 is shown connected to the pivoted frame 2, in which the head 3 of the propelling-rod 4 is moved up and down, as desired, by means of the bell-crank lever 5 and the rod 6, extending to the lever 7 at the driver's platform.

The general arrangement of this device is the same as described in the application last referred to.

Referring to Fig. 2, it will be seen that there are two of the pivoted frames, each being provided with a sliding head for its propelling-rod, and each being provided also with a bell-crank lever 5. The upper ends of these two levers are connected by a cross-rod 8, and to this the rod 6 is connected, so that both bell-crank levers are operated simultaneously by a single movement of the lever 7. It will be understood that the purpose of raising and lowering the points 3 is to vary the distance between said points and the pivots 9 of the frames 2, and hence the effective stroke of the propelling-rods.

On an axle of the vehicle are mounted two wheels with broad rims, as shown at 10. Alongside of said wheels, centered on the

axle, are arms 11, carrying at their upper ends and adjacent to the rim of said wheels a disk or plate 12, from which project two posts 13 55 14, one below and one above the pivot 15. Passing around the flanged wheels are chains 16, one end of each chain being connected to an upper post 13, preferably by means of a bolt passing through said post and confined 60 by nuts, as shown, the other end of the chain being connected to a lower post 14, preferably by means of sleeves 17, which are slipped over the post. Any suitable number of chains, 65 belts, or other similar devices, which may be called generically "bands," may be placed side by side around the wheels. One wheel with a wider rim may be used instead of two wheels.

The chain illustrated is composed of rectangular-shaped links pivoted together near 70 the upper or outer edge. The inner or bearing faces of the links are preferably notched, as shown at 18, for the purpose of reducing the bearing-surface, lightening the chain, and 75 causing the chain to bear more readily on the curved surface of the wheel.

19 is an arm mounted on the axis 15 and connected with plate 12 by means of a cross-pin 20. To the upper end of arm 19 is connected 80 the propelling-rod 4.

21 is a stop, the function of which will be hereinafter described.

The operation of the apparatus above described is as follows: The motor runs continuously, and thus reciprocates the rods 4, except when the pins 3 are brought in line with points 9, (the dead-center,) when the movement of the reciprocating frames 2 has no effect on the propelling-rods. As the propelling-rods move backward the disk or plate 12 is turned slightly on its pivot, loosening the chain and allowing it to slip on the rim of its wheel. Too great motion in this direction is prevented by the stop 21. When said 95 stop strikes arm 11, further movement on pivot 15 is prevented, and the pivot, with the parts supported thereon, is carried bodily along, moving on the car-axle as a center. As the propelling-rod moves forward—that is, toward 100 the motor—the first tendency is to turn 12 on pivot 15, and thus to tighten the chain, causing it to grip or clutch the wheel-rim, and then by continued movement to turn the wheel in

the direction of the arrow in Fig. 3. By means of the connection of the chain above described—that is, having one end connected above and the other below the center—only
 5 one-half as much movement is necessary to loosen and tighten the chain as would be necessary, for example, if one end were attached as shown and the other end were attached at the center. The action of the two propelling-
 10 rods and clutches is the same, except that they operate alternately—that is, one is moving forward while the other is moving backward—by reason of the opposite arrangement of the respective crank-arms on the motor.
 15 A single propelling-clutch would be operative, but would not move the device with as much steadiness as the two combined.

I do not confine myself to the connection above described between the motor and the
 20 clutch nor to the details of construction of the chain and means for supporting and operating the plate or disk carrying the posts to which the chains are anchored, since it is evident that these things may be varied to a considerable extent without departing from this
 25 invention.

Having thus described my invention, what I claim is—

1. The combination, with a shaft or axle, of a
 30 wheel rigidly mounted thereon, a band passing around said wheel, a plate adjacent to the periphery of the wheel, a pivot for said plate and a suitable support therefor, one end of the band being connected to the plate above
 35 its pivot and the other end of the band being connected to the plate below its pivot, and means for reciprocating said plate, whereby when moved in one direction the band is loosened and when moved in the opposite direc-
 40 tion the band is tightened and turns said wheel, substantially as described.

2. The combination of a shaft or axle, clutch-wheels rigidly mounted thereon, a band passing around each wheel and connected to plates
 45 on opposite sides of their pivots, and means for reciprocating said plates alternately, substantially as described.

3. The combination of a shaft or axle, clutch-wheels mounted thereon, a band passing
 50 around each wheel and each connected to a plate on opposite sides of its pivot, means for turning said plates on their pivots, limiting-stops for the plates, and mechanism for reciprocating the plates alternately, substan-
 55 tially as described.

4. The combination of the propelling-rod, a clutch-wheel, a band extending around the clutch-wheel, a plate adjacent to the periph-

ery of the clutch-wheel, a pivot for said plate, two posts on said plate, one on each side of the pivot, one end of the band being connected to one post and the other end to the second
 60 post, and means for limiting the movement of the plate on its pivot, substantially as described.

5. The combination of a wheel mounted on a shaft or axle, a plate adjacent to the periphery of said wheel, a chain passing around the wheel and connected to the plate on two sides
 70 of its pivot, and means for turning the plate on its pivot and reciprocating it, whereby the chain is loosened when moved in one direction and is tightened and turns the wheel when the plate is moved in the opposite direction, sub-
 75 stantially as described.

6. The combination of the motor-shaft having oppositely-placed crank-arms, propelling-
 80 rods operated thereby, and the clutches, each composed of a clutch-wheel and chain passing around the wheel and connected to a plate adjacent to the periphery of the wheel and reciprocated by the motor, substantially as
 85 described.

7. The combination of the clutch-wheel, the pivoted plate adjacent to its periphery, hav-
 90 ing two posts arranged on opposite sides of the pivot, and a band composed of several separately-removable strands connected to said posts, substantially as described.

8. The combination, with the motor-shaft
 90 of a vehicle and reciprocating pitman connected to the shaft and to a pivoted frame supporting the head of a propelling-rod and means for raising and lowering the said head, where-
 95 by the speed may be varied without changing the speed of rotation of the motor-shaft, of a connection between the propelling-rod and vehicle-axle, consisting of a clutch-wheel and an arm centered on the axle, a plate adjacent
 100 to the periphery of the wheel and carried by said arm, a band passing around the wheel and connected to the plate on opposite sides of its pivot, and means for reciprocating the plate, substantially as described.

9. A clutch-wheel, in combination with a
 105 chain passing around the wheel and anchored to a reciprocating plate, said chain being made of links pivoted together, their inner or working faces being notched, substantially as de-
 110 scribed.

This specification signed and witnessed this 29th day of April, 1890.

THOS. A. EDISON.

Witnesses:

THOMAS MAGUIRE,
 HARRY F. MILLER.