(No Model.)

G. R. LEAN.

MEANS FOR TRANSMITTING POWER TO DRIVING AXLES.

No. 459,785. Patented Sept. 22, 1891.

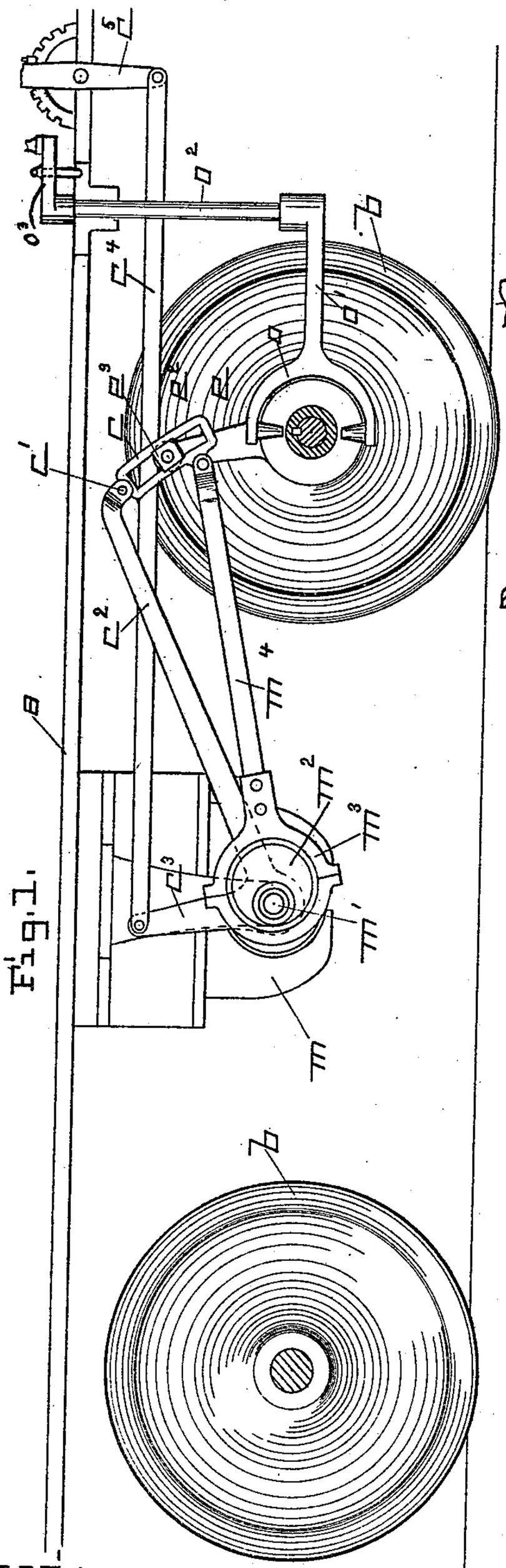

Fig. 1.

Fig. 2.

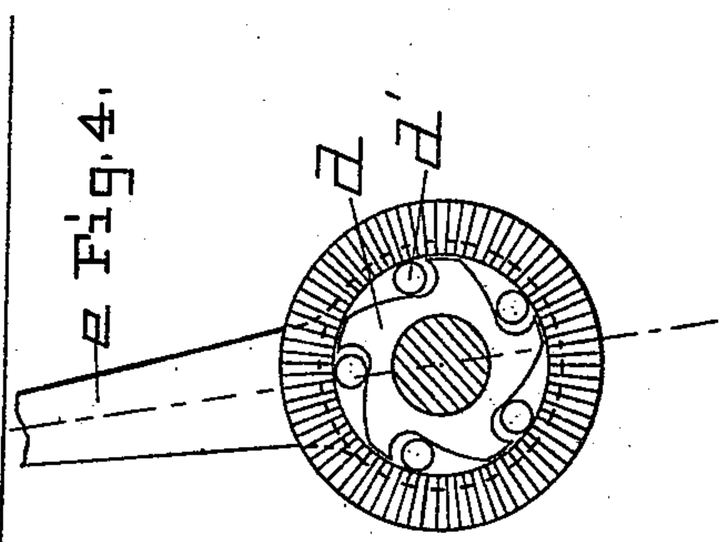

Fig. 4.

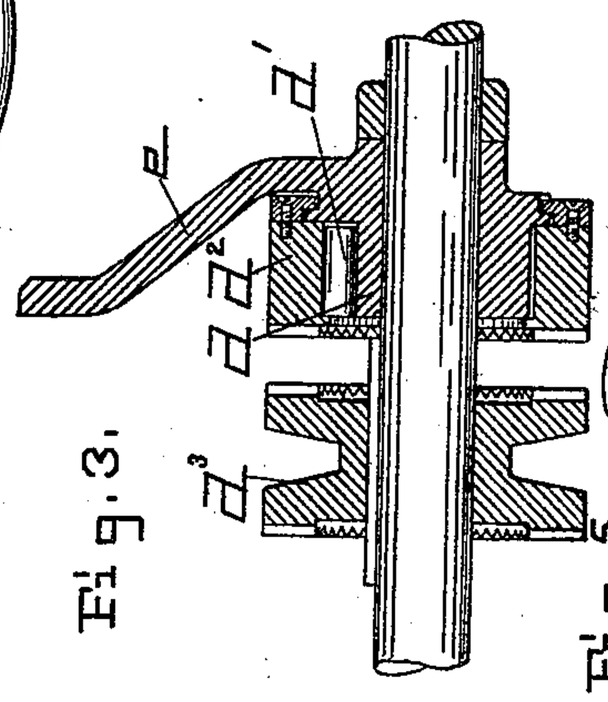

Fig. 3.

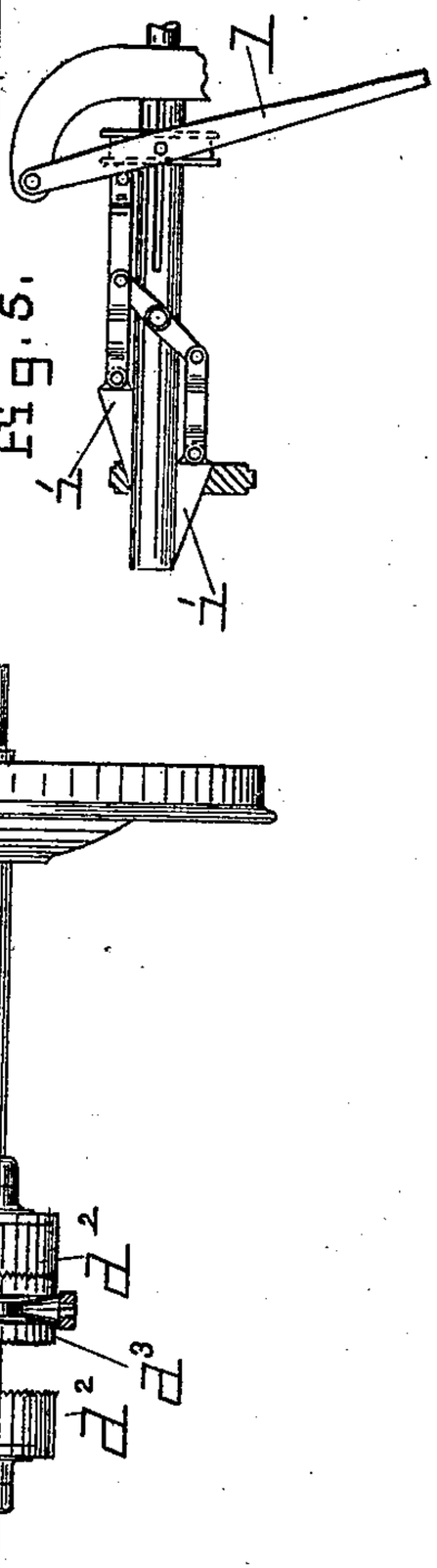

Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE R. LEAN, OF BOSTON, MASSACHUSETTS.

MEANS FOR TRANSMITTING POWER TO DRIVING-AXLES.

SPECIFICATION forming part of Letters Patent No. 459,785, dated September 22, 1891.

Application filed February 10, 1891. Serial No. 380,981. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. LEAN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Means for Transmitting Power to Driving-Axles and for Varying the Effect Produced, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In electric cars it is now deemed most desirable that the electric motors shall operate continuously, and hence means must be devised for transmitting such power to the driving axle or axles at will, and also means must be provided whereby the speed of the car can be varied.

This invention has for its object to construct suitable power-transmitting devices whereby the power of a continuously-operating armature or shaft of the electric motor may be transmitted to the driving-axle, and also to provide means for varying the effective operation or amount of power transmitted.

In accordance with this invention the armature or driving shaft of the electric motor is running continuously, and suitable connecting mechanism is interposed between it and the driving-axle, whereby said axle may be rotated continuously, such connecting mechanism being herein represented as an eccentric-disk placed on the continuously-operating shaft of the motor, a rod connecting the eccentric-strap on said disk with an arm which is attached to one member of a suitable clutch mechanism arranged to act intermittently on the driving-axle.

The means herein shown for increasing or decreasing the speed of the driving-axle consists of a link loosely arranged on an arm which is raised and lowered at will, and the arm which is attached to one member of the clutch mechanism is connected with the link, and an eccentric-rod is connected directly to siad link and by which the said link is moved on its pivot. As the link is raised and lowered its connection with the arm is varied so that a greater or less throw will be given to said arm on each movement of the eccentric-rod.

Figure 1 shows in side elevation a portion of a car, an electric motor, and power-transmitting devices embodying this invention; Fig. 2, a view showing a portion of the driving-axle and clutch mechanism therefor; Figs. 3 and 4, details of the clutch mechanism, and Figs. 5 a detail showing a modified form of the speed-controlling mechanism.

The platform a of the car and its wheels b may be of any well-known or suitable construction.

The electric motor m, supported in any desirable way, may be of any well-known or suitable construction, its armature or driving shaft m' having secured to it eccentrically a disk m^2. A strap m^3, inclosing the eccentric-disk m^2, is attached to an eccentric-rod m^4, which is attached at its opposite end to the lower end of a slotted link c, which is pivoted at c' to the extremity of an arm c^2, secured to or formed integral with an arm c^3, which is arranged at substantially right angles with relation to the arm c^2 to thereby constitute a bell-crank lever loosely arranged on the armature or driving shaft m'. The arm c^3 is connected by a link c^4 with a pivoted lever c^5, which is adapted to be operated by the attendant on the car. By turning the lever c^5 on its pivot the bell-crank lever c^3 c^2 may be moved to raise and lower the slotted link c, and as the armature or driving shaft m' of the motor rotates continuously the said slotted link c will be vibrated on its pivot.

A clutch mechanism of any suitable construction is connected to the driving-axle, and the particular construction which I prefer to employ consists of a notched hub d, in the notches of which rolls d' are placed, and the shell d^2, inclosing said rolls d' and hub d and a collar d^3, arranged to slide on said driving-axle, but to turn with it, and another hub, as d, arranged loosely on the driving-axle and having notches which contain rollers, as d', and a shell, as d^2, inclosing said hub and rollers. The inclined sides of the notches of the two hubs are directed in opposite directions, and the adjacent faces of the shells d^2 d^2 are serrated, that either one may be engaged by the sliding collar d^3. Arms, as e e', are secured to or formed integral with the hubs d^2 d^2, said arms being united at their upper ends by a cross-bar e^2, which passes loosely through a block e^3, arranged to occupy any desired position in the slot in the link c. As

the link *c* is vibrated on its pivot *c'*, the said arms *e e'* will be simultaneously vibrated.

The sliding collar d^3 is designed to be moved into engagement with one or the other shell d^2 d^2, depending upon whether it is desired to turn the driving-axle forward or backward, and the said sliding movement is effected by a yoke *o*, having on its arms suitable projections which enter a circumferential groove in said collar, said yoke being formed integral with or secured to an arm *o'*, which is secured to the lower end of a rod o^2, to which a crank-arm o^3 is secured, by which it may be turned to swing the yoke *o* and slide the collar into engagement with one or the other shell.

In lieu of this particular form of clutch mechanism, any other suitable or well-known construction may be employed.

It will be seen that as the slotted link *c* is vibrated, as above described, the arms *e e'* will be vibrated, and the driving-axle thereby rotated intermittingly or step by step, and by the different positions of the block e^3 in the slot in the link the amount of such vibratory movement is determined. It will also be seen that by dropping the slotted link *c* so that the block e^3 will occupy a position at the extreme upper end of the slot the said link may be vibrated, but the arms *e e'* will cease to vibrate.

Instead of employing the slotted link and means for moving it to vary the vibratory movement of the arms *e e'*, thereby increasing and decreasing the speed of the car, I may employ a pair of wedge-blocks *i i'*, (see Fig. 5,) adapted to bear on the shaft and to serve as bearings for the eccentric-disk, and by moving said wedge-blocks in one or the other direction the eccentricity of said disk may be varied at will. The wedge-blocks *i i'* are moved simultaneously in opposite directions by a hand-lever *l*. Thus it will be seen that various forms of mechanism may be employed for increasing or decreasing the distance the arms *e e'* shall travel to thereby increase or decrease the speed of the car.

It will be seen from the foregoing that the motor may be supported on the car-body independent of the truck, and notwithstanding independent movement the operation is not impaired.

I claim—

1. In a car, an electric motor having a continuously-rotating shaft, and a driving-axle, combined with a clutch mechanism for rotating said driving-axle continuously, the movable members of which are connected with an eccentric-disk secured to the said continuously-rotating shaft, substantially as described.

2. In a car, a motor having a continuously-rotating shaft and a driving-axle and a clutch mechanism for rotating it continuously, an eccentric-disk on said continuously-rotating shaft, and an eccentric-rod connected to the operating member of the clutch mechanism, substantially as described.

3. In a car, a motor having a continuously-rotating shaft and driving-axle, a clutch mechanism for rotating it continuously, an eccentric-disk on the said continuously-rotating shaft, an eccentric-rod, and the slotted link *c* for varying the movement of said clutch, substantially as described.

4. The continuously-rotating shaft, an eccentric on it, a driving-axle, a clutch mechanism, a slotted link connected with the clutch and also connected with said eccentric by means of which it is vibrated, and means for raising and lowering said link, substantially as described.

5. A continuously-rotating shaft, a slotted vibrating link, and two arms, one of which is connected with and vibrates the link and the other of which serves as a support for the pivot of said link, and also as a means for changing its position with relation to its work, substantially as described.

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

GEORGE R. LEAN.

Witnesses:

BERNICE J. NOYES,

A. S. WIEGAND.