

(No Model.)

W. STINE.
ELECTRIC MOTOR FOR STREET CARS.

No. 547,302.

Patented Oct. 1, 1895.

Fig 1

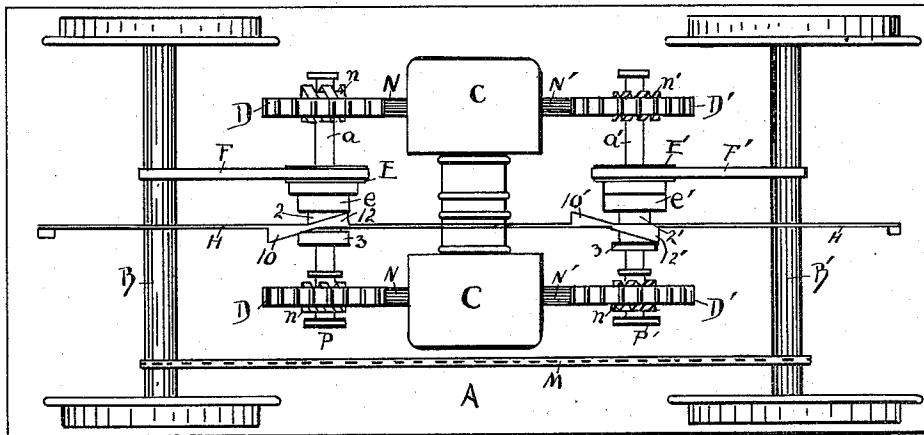
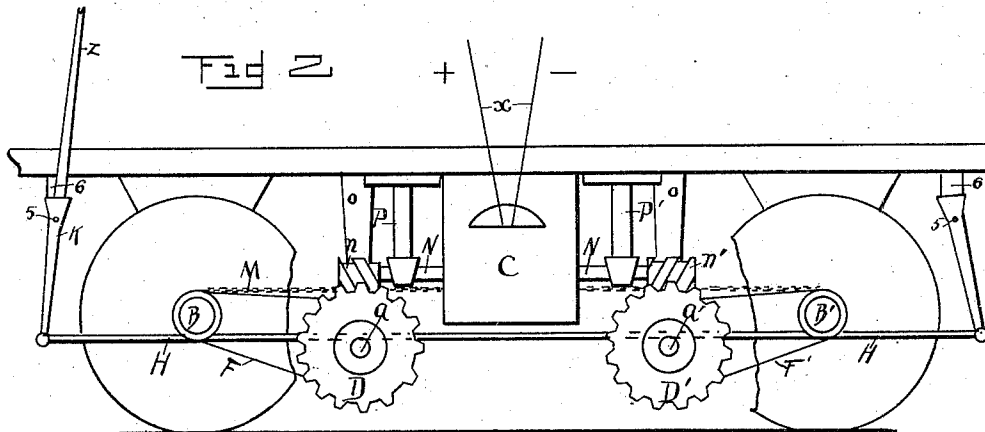


Fig 2



WITNESSES:

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WILLIAM STINE, OF OMAHA, NEBRASKA.

ELECTRIC MOTOR FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 547,302, dated October 1, 1895.

Application filed January 11, 1895. Serial No. 534,595. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM STINE, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain useful Improvements in Electric Motors for Street-Cars; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention has relation to a new and novel improvement in electric motors.

The object of my invention is to provide an electric motor that shall be arranged to operate continuously, the motor being continuously within an electric circuit and being connected by means of a mechanical contrivance with the axle of the car at the will of the operator.

In the accompanying drawings, Figure 1 shows a bottom view of a car equipped with my improvement, while Fig. 2 shows an end elevation thereof.

Similar letters and numerals refer to corresponding parts.

A represents the bottom of an ordinary street-car, which is provided with the ordinary car-axes B B, which are fixed in the usual manner. At a suitable point I have provided an electric motor C C, arranged, constructed, and secured to the car in the usual manner. In this instance I have shown a duplex motor, the armature-shaft N of which projects on each side beyond the motor, the armature shafts being provided at each projecting end with an ordinary worm-gearing. These projecting shafts are suitably supported, and immediately below the worms is positioned a gear D, there being one gear for each end of the shafts, so that these gears D are used in sets of four. The gears D D are mounted upon one shaft *a*, while the gears D' D' are mounted upon the shaft *a'*. Each of these shafts *a a'* is further provided with a main driving-pulley E, which loosely works upon its shaft. Working upon the shafts *a a'* is a clutch mechanism *e e*, which are connected in any suitable manner to their respective shafts and are permitted longitudinal or lateral adjustment, but which are carried

about with each revolution of the shaft, as is common with ordinary friction-clutches. In addition, these friction-clutches are provided with an extending neck portion 2, terminating in the flange 3. Communicating with the driving-pulleys E are the driving-belts F F, which connect the pulleys to the driving-axes B of the car. The motors C C are connected to the trolley-wire by any suitable means. Working upon the neck portion 2 and between the clutch *e* and the flange 3 is an operating-bar H, passing longitudinally below the car and provided at each end with an upwardly-extending lever-arm K, which is pivoted at the point marked 5 to an ordinary hanger 6. This operating-rod H is allowed a longitudinal adjustment, and at a point immediately opposite the shafts *a a'* is provided with the outwardly-extending triangular projections marked 10 and 12. These projections 10 and 12 are approximately the width of the shoulder 2 and adapted to work between the friction-clutch *e* and flange 3. Each of the main supporting car-axes is further provided with a connecting-chain M, as is shown in the figures. When all the instrumentalities have been arranged, the operation of my device will be as follows:

The motors C, which could be a single motor or any suitable number of them properly connected, are brought in proper electric connection with the main and return circuits, and the motors C C, it will be understood, are continuously operating. There is of course a mechanism in addition by means of which the motorer can make or break the electric circuit. The rotary motion of the armatures would be transmitted to the armature-shafts N, which shafts of course continuously revolve, and so actuate their connected worms *n*. These worms in turn being connected to the pinions D D D' D' would continuously revolve the power-shafts *a a'*, so that these two shafts, in connection with the motor, would be continuously revolving. Now if at any time the motorer desires to start the car it would simply be necessary for him to throw the operating-lever *z* forward, which motion would have carried the connected rod H forward, and this would have thrown the triangular shoe 12 of the rod against the forward friction-clutch *e*, so as to securely lock

this clutch with its connected driving-pulley E. This would have brought the forward axle B into motion by means of the connecting-belt F, and the car would have been carried forward. As soon as the car would be stopped, it would simply be necessary to throw the lever *z* in an approximately central position, when the triangular shoe 10 would engage the rear flange 3 and throw the clutch out of connection. If it should be desirable to instantly force the car in an opposite direction, it would be simply necessary to throw the lever *z* backward its full stroke, when the shoe 10' upon the opposite end of the rod H would engage its friction-clutch to actuate the driving-shaft *a'* to throw the rear car-axle B' into connection therewith, and so promptly carry the car in the opposite direction.

It will be seen that the car is provided with two driving-shafts working in opposite directions, which shafts are never simultaneously engaged, one shaft only being engaged at one time and serving to drive the car in one direction and the other in the opposite direction. One of the great advantages by this arrangement is that the car can be more readily started, as the motors are in full swing and are not first required to be brought into motion before they exert their power upon the car. By means of the connected chain M the forward and rear axles B B', are always used in driving the car. Where air-brakes are used, another advantage is gained, in that the air-chambers can be immediately filled, as the car does not have to run a certain distance before the chambers are filled, as there is no motion lost by virtue of this arrangement.

Now, having thus described my said invention, what I claim as new, and desire to secure by United States Letters Patent, is—

1. In a driving mechanism for electric cars the arrangement of a driving motor in connection, by means of a worm and gear, with two driving shafts, each of said shafts working in opposite directions, of driving pulleys loosely mounted upon each of said driving shafts in power connection with the car axles, a clutch mechanism mounted upon each of said driving shafts provided with extending

collars and a duplex operating bar provided with the four projecting shoes said shoes being adapted to engage the collars of said clutch pulleys to alternately engage or release said clutch mechanisms, all substantially as and for the purpose set forth.

2. In an electric car, the combination of a continuously revolving electric motor, the projecting armature shaft of which is provided with a worm at each end, gears mounted below said car and meshing with said worms, said gears being mounted upon driving shafts, there being one driving shaft upon each side of the electric motor, driving pulley mounted loosely upon said driving shafts in belt connection with the car axles, a clutch mechanism mounted upon said driving shafts provided with an extending curved collar, and a duplex operating bar provided with four projecting shoes, two of said shoes simultaneously working within said collars to alternately actuate said clutch mechanism, to engage said power shafts revolving in opposite directions, all substantially as and for the purpose set forth.

3. In an electric car the combination with the motors, C, C, provided with the extending armature shafts, N, N', provided at the ends with the worms, *n, n, n', n'*, revolving said worms in opposite directions, the power shafts, *a, a'*, provided with the worm gears, D, D, D', D', engaging said worms, the power pulleys, E, E', the clutch pulleys, *e, e'*, provided with the flanged collars, 2, 2', said driving pulleys, E, E', being in belt connection, F, F', with the gear wheels, D, D', in combination with the operating bar, H, provided with the shoes, 10, 10', and 12, 12', said shoes working within the curved collars, 2, 2', to throw said clutches, *e, e'*, into or out of gear in driving the car either in one or the opposite direction, all substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of witnesses.

WILLIAM STINE.

Witnesses:

L. D. ERWIN,
O. F. DAWSON.