(No Model.) 2 Sheets—Sheet 1.

J. J. THOMPSON.

REVERSIBLE STREET CAR.

No. 590,778. Patented Sept. 28, 1897.

Fig. 1.

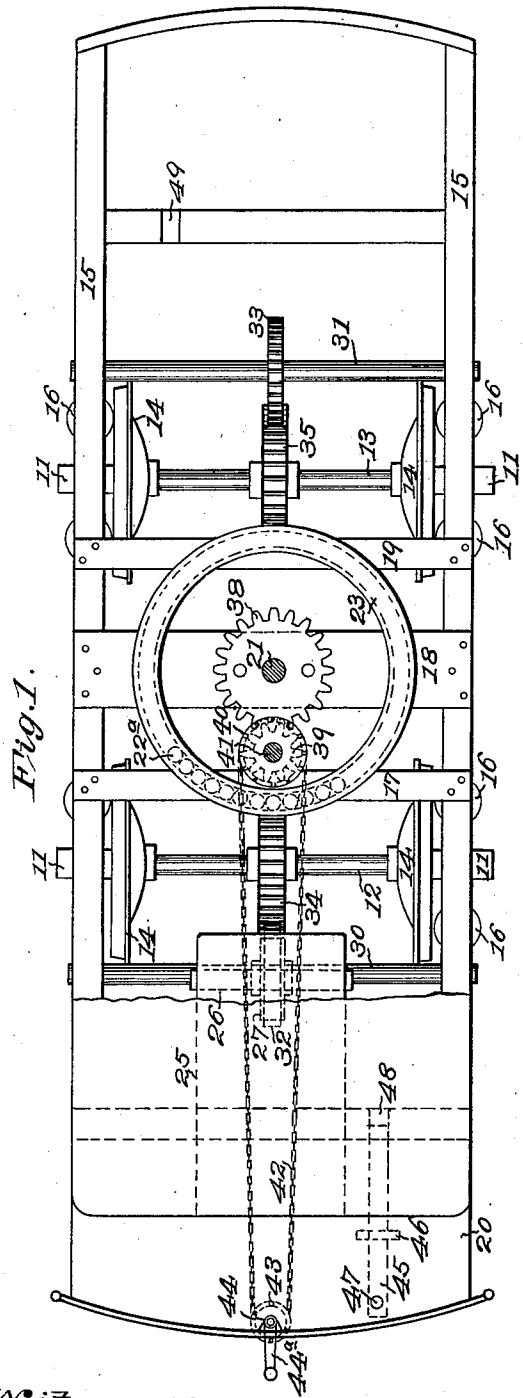
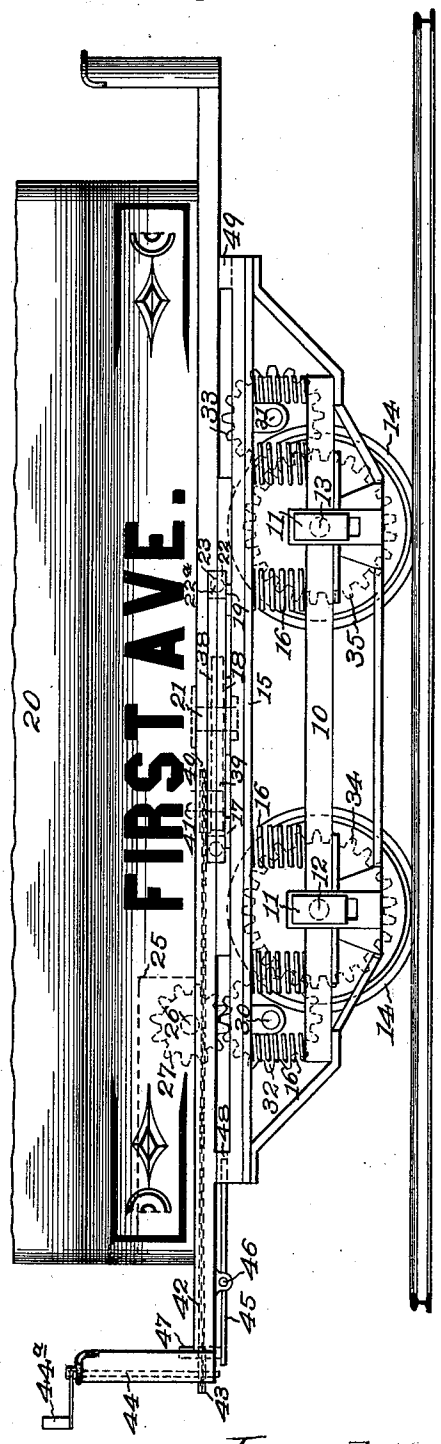


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

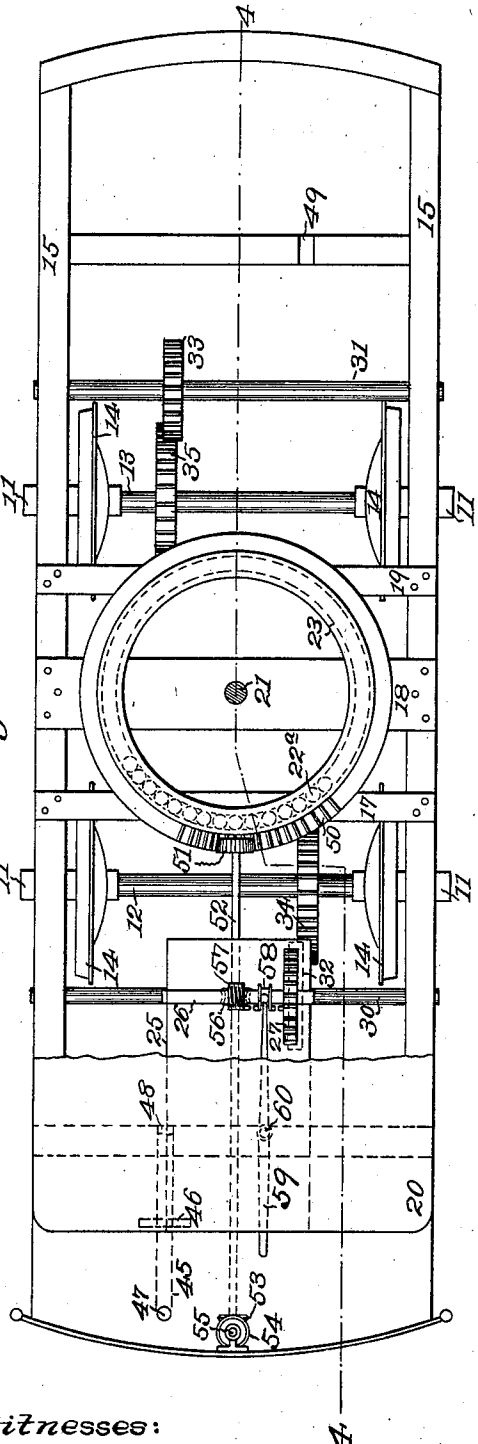
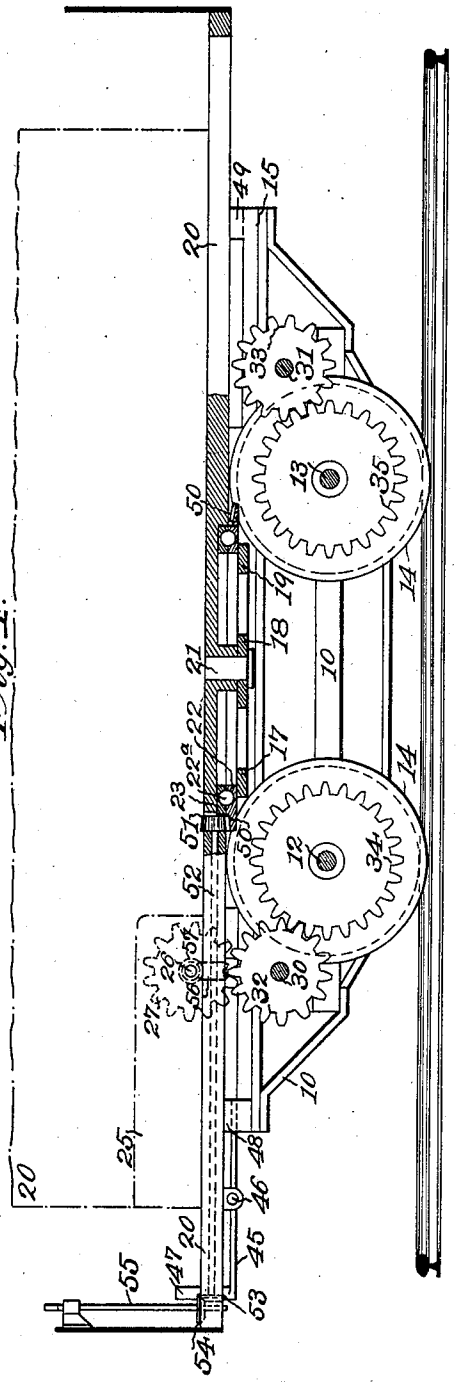


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN JAMES THOMPSON, OF POUGHKEEPSIE, NEW YORK.

REVERSIBLE STREET-CAR.

SPECIFICATION forming part of Letters Patent No. 590,778, dated September 28, 1897.

Application filed March 31, 1897. Serial No. 630,126. (No model.)

To all whom it may concern:

Be it known that I, JOHN JAMES THOMPSON, a citizen of the United States, residing at Poughkeepsie, Dutchess county, and State of New York, have invented certain new and useful Improvements in Reversible Street-Cars, of which the following is a full, clear, and exact specification.

This invention relates to street-cars, and particularly to that class where the body of the car is pivoted to the truck-frame in such a manner that when the car arrives at the end of its route the body of the car may be turned one hundred and eighty degrees, bringing the forward end of the car again to the front or in the direction of its travel.

One object of my present invention is to produce a simple, compact, and durable mechanism to turn the body of the car on its truck and one that is easily managed either by hand or power and with a minimum amount of friction of the working parts, whereby the operator handling the car manipulates the motor and brake and lever 45 for locking the car-body to the truck from one end or platform of the car, therefore requiring but a single set of operating devices for the parts in question and thereby obviating the laborious task of reversing the backs of the car-seats at the end of the route, thus saving time and the expense of fitting the car up for running in both directions, or, as is often the custom, of having a turn-table at each end of the route to turn the car one hundred and eighty degrees.

In the preferred embodiment of my invention herein shown and described the car comprises, in part, a suitable framework supported by the journal-boxes, axles, and wheels, a car-body pivotally mounted in a suitable bearing on said frame, a series of auxiliary shafts provided with gears meshing into driving-gears on the axles, a motor from which the power is derived to impart the motion and operatively connected with one of the series of auxiliary shafts, a car-body-rotating mechanism operated by hand or by the motor, and a locking-lever to hold the car-body rigidly to the truck, all substantially as hereinafter described, and more particularly set forth in the claims.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of the car body and truck, having part of the car-body removed to show the truck, the king-bolt, and various mechanisms. Fig. 2 is a side view having the upper part of the car-body removed. Fig. 3 is a plan view of a modified form also having a part of the car-body removed. Fig. 4 is a section on line 4 4 of Fig. 3, showing the car-body in dash and dotted lines.

As a preliminary to the description of the construction and mode of operation of the several mechanisms of my improved street-car it is desired to state that any type of motors may be used for generating the power—such as electric motors of any well-known pattern, steam-engines, spring-motors, compressed-air motors, or any type of gas-engines in which is used a highly-combustible gas or any suitable liquid hydrocarbon mixed with air, in which the ultimate result is the turning or revolving of the motor-shaft.

For convenience I shall hereinafter refer to the power-generator as the "motor" and "motor-shaft."

Similar characters designate like parts in all the figures of the drawings.

In the drawings the numeral 10 indicates in a general way the lower frame of the truck, which may be of any general design or of any usual form and construction and which is mounted upon the journal-boxes 11, in which the axles 12 and 13 are journaled and to which the wheels 14 are rigidly connected. The upper frame 15 of the truck rests on a series of springs 16 of any well-known pattern—in the drawings shown as spiral springs. On the top of the upper frame are rigidly connected the cross-bars 17, 18, and 19, which support the car-body, the central cross-bar receiving the king-bolt 21 of the general form and construction and by means of which the car-body is pivotally mounted upon the truck. To reduce the friction of the working parts to a minimum, as the weight of the car-body is sometimes very great, I have shown in the drawings a ball-bearing between the car-body and the truck, which is concentrically mounted with the bolster. The lower ball-race 22 is rigidly held on the cross-bars 17, 18, and 19 of the truck, the upper ball-race 23 being attached to the car-body 20

and each having a groove in which the balls 22^a are placed.

As a simple and convenient means for communicating a rotary motion from the motor (designated in a general way by the numeral 25, having the motor-shaft 26 journaled therein, to which the motor-shaft pinion 27 is rigidly affixed) I have shown in the drawings a set of auxiliary shafts 30 and 31, journaled in the frame of the truck, having gears 32 and 33 fastened thereto, meshing into gears 34 and 35, which are securely keyed upon the axles 12 and 13, respectively, which propel the car forward.

It is obvious that the motor-shaft pinion 27 is in mesh with only one of the gears of the auxiliary shafts at a time and that the motor 25 is mounted on the car-body at the front end within easy reach of the operator.

The auxiliary shafts 30 and 31 are mounted equidistant from the king-bolt 21, in substantial parallelism with one another and with the two axles, and the gears 32 and 33, which are fastened to said auxiliary shafts, are so located that the center line of the truck passes through the center of the gears, as shown in Fig. 1, or so that the inner faces of the gears are at equal distances from the center line of the truck, as shown in Fig. 3.

As a novel and improved means of turning the car-body upon its king-bolt and its ball-bearing on the truck when the car arrives at the end of the route the center cross-bar 18, in which the king-bolt 21 is held, has fastened upon it the center gear 38 and is therefore fixed stationary or against rotation on the truck. Into the center gear 38 meshes the pinion 39, to which is securely held the sprocket-wheel 40, and which are rotatably mounted on the stud 41, which is rigidly held in the frame of the car-body, and they therefore rotate with the latter. The endless chain 42 passes above the ball-race 23 and is placed around the sprocket-wheel 40, and the sprocket-pinion 43, journaled at the front platform on the shaft 44, the upper end of which has a removable crank 44^a attached thereto. Thus when the said crank 44^a is revolved the car is rotated on the king-bolt 21 and its ball-bearing 22 and 23, bringing the front end of the car into the direction of travel when the car arrives at the end of the route.

To lock the body of the car to the truck, I have provided a locking-lever 45, pivoted to the under side of the platform of the car-body by the pivot 46, the forward end of the said locking-lever 45 having the stud 47 projecting above the floor-line and capable of being operated by foot from the platform by the operator.

48 and 49 are notches in the framing of the truck, into which the lever drops and locks the car-body to the truck and holds the same rigidly in its respective positions.

In Figs. 3 and 4 I have shown a modification by which the car-body may be rotated from one position to another and in which the power to turn the same may be either by hand or directly taken from the motor-shaft 26. The mode of operating the axles to propel the car forward and also the means for locking the body of the car to the truck are identical, and therefore need no further explanation.

The lower ball-race has a bevel-pinion 50 attached thereto, both of which are fixed and connected to the cross-bars 17 18 19, and therefore are solidly connected to the frame of the truck. A bevel-pinion 51 meshes into the bevel-gear 50 and is attached to the shaft 52, journaled in the lower part of the frame of the car-body, and carries on the platform end the miter 53, which meshes into the miter 54 and is connected to the upright shaft 55, the upper free end of which is adapted to be operated by the crank in any of the well-known manners. On the shaft 52 is also fastened a worm-wheel 56, which gears into the worm 57, which is loosely mounted on the motor-shaft 26, as well as, in this modification, is the motor-shaft pinion 27. Mounted on the motor-shaft, between the worm 57 and the motor-shaft pinion 27, is a clutch 58, by means of a spline or feather therefore rotating with the motor-shaft, but laterally movable, and that clutch may be brought into operative position with the worm on one side or into engagement with the motor-shaft pinion 27 on the other side by the lever 59, pivoted on the pivot 60 on the top of the motor.

By the means just described the car is propelled forward when the clutch 58 is in engagement with the motor-shaft pinion 27, and the motor-shaft will revolve loosely in the worm. When the clutch 58 engages neither the worm nor the pinion, the motor-shaft will revolve loosely, performing no work. If the clutch 58 engages the worm-wheel 57, motion will be communicated to the shaft 52, thereby rotating the body of the car on the king-bolt.

The operation of the truck and car as a whole is as follows: A rotary motion or power being communicated by any of the well-known power-generating mechanisms, as previously described, to the motor-shaft 26 and the motor-shaft pinion 27 the power is transmitted through the train of gears 32 and 34 to the axle 12, which carries fastened thereto the wheels 14, which carry the car along until it reaches its destination. When the car reaches the end of the route, the body of the car is unlocked from the truck by means of the locking-lever 45, the operator placing his foot on the projecting pin 47 and raising the lever out of the notch 48, thus unlocking the car-body from the truck, then operating the crank 44^a and rotating the vertical shaft 44 and the sprocket-pinion 43, drawing the chain 42 around and with it the sprocket-wheel 40, thus rotating the pinion 39, which is in mesh with the center wheel 38, and thereby rotating the car-body on the king-bolt 21 and its ball-bear-

ings 22 and 23 about one hundred and eighty degrees, then releasing the foot from the projection 47 the locking-lever will engage the notch 49 and thus hold it in the locked position and bring the front end of the car again in line of the direction of its travel.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a motor-shaft mounted on the car-body and with a pair of auxiliary shafts and the two axles supported and mounted for rotation in the truck and in substantial parallelism with one another, means for rotating one of said axles from the motor-shaft, the king-bolt mounted concentrical to the axles and means for rotating the body of the car on the truck for the purpose set forth.

2. In a truck, the combination of two axles and two auxiliary shafts, all mounted in the truck and in substantial parallelism with one another, a king-bolt upon which the car-body is rotatably mounted, mechanism to rotate the body of the car upon the king-bolt, and mechanism whereby motion may be communicated to one of the auxiliary shafts and to the axle, substantially as described.

3. In a truck, the combination of two axles, and two auxiliary shafts, all mounted in the truck and in substantial parallelism with one another, a king-bolt upon which the car-body is rotatably mounted, mechanisms to rotate the body of the car upon the king-bolt, and mechanism whereby motion may be communicated to one of the auxiliary shafts and to the axle, substantially as described, and means to unlock and lock the car-body to the truck, all combined and operating substantially as described.

4. The combination of a pivotally-mounted car body and truck, a motor mounted upon one end of the car, means consisting of the auxiliary shaft and its gear, to transmit the power to the axle, the king-bolt upon which the car rotates, and means to rotate the body of the car on said king-bolt, consisting of the center gear, pinion, sprocket wheels and chain, all combined and operating substantially as described.

5. The combination of a pivotally-mounted car body and truck, a motor mounted upon one end of the car, means consisting of the auxiliary shaft and its gear, to transmit the power to the axle, the king-bolt upon which the car rotates, and means to rotate the body of the car on said king-bolt, consisting of the center gear, pinion, sprocket wheels and chain, all combined and operating substantially as described, and means for unlocking and locking the car-body to the truck; all substantially as described.

6. The combination of a pivotally-mounted car body and truck, a motor mounted upon one end of said car-body, means to transmit the rotary motion of the motor-shaft to the auxiliary shaft and to the axle, the king-bolt on which the car-body is pivotally mounted, the ball-bearing between the car-body and the truck, and means substantially as described, to unlock and lock the car-body to the truck, substantially as set forth.

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