(No Model.)

F. W. SMITH, Jr., & S. S. WILLIAMSON.

STREET CAR.

No. 455,842. Patented July 14, 1891.

Fig 1

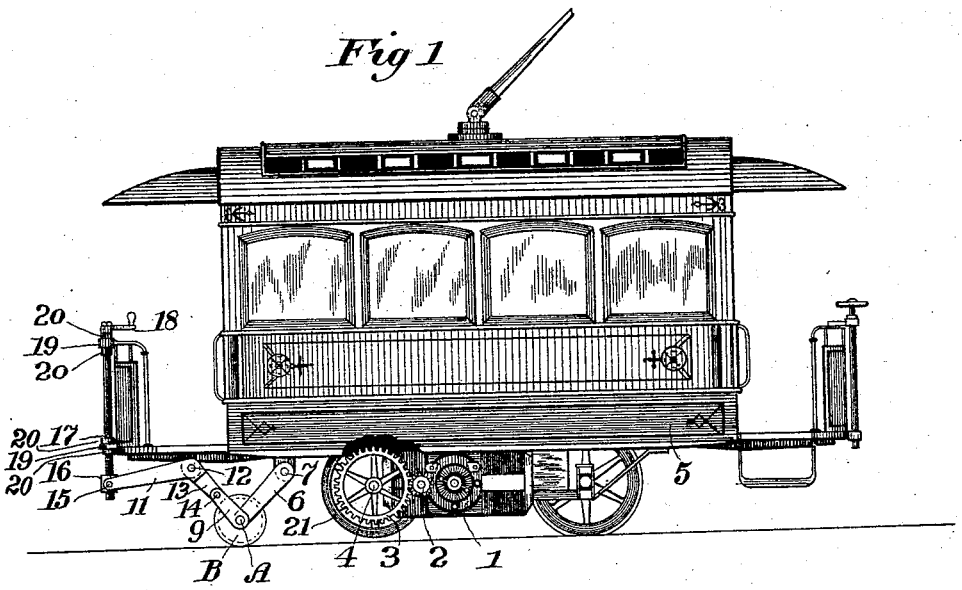


Fig 2

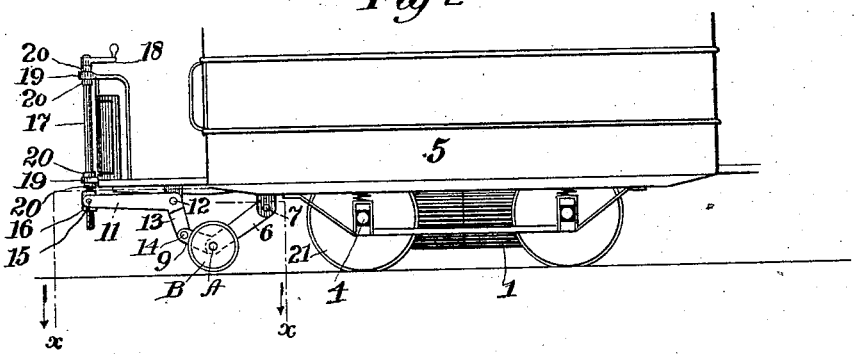
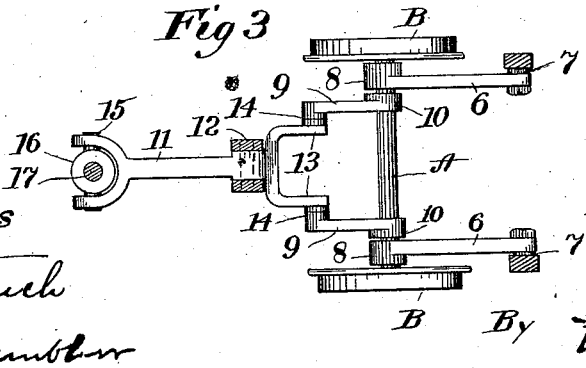


Fig 3



Witnesses

J. Finch

R. C. Cumbler

Inventors

F. W. Smith Jr.

S. S. Williamson

By F. W. Smith Jr.

Atty.

UNITED STATES PATENT OFFICE.

FRIEND W. SMITH, JR., AND SAMUEL S. WILLIAMSON, OF BRIDGEPORT, CONNECTICUT.

STREET-CAR.

SPECIFICATION forming part of Letters Patent No. 455,842, dated July 14, 1891.

Application filed February 16, 1891. Serial No. 381,658. (No model.)

To all whom it may concern:

Be it known that we, FRIEND W. SMITH, Jr., and SAMUEL S. WILLIAMSON, both citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Street-Railway Cars; and we do hereby declare the following to be 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.

Our invention relates to street-railway cars which are run by a motor carried by the cars, but has especial reference to certain novel means whereby the movement of the car may be arrested without disengaging the connection between the motor and the car-axle.

Our invention consists, first, in raising the motive wheels of a car clear from the track and in supporting the car on auxiliary supports carried by the car, and, second, in jacking up or raising one or both ends of the car by means carried by the car, whereby the motive wheels of the car are raised from the track.

In the accompanying drawings, Figure 1 is a side elevation of a car equipped with means for carrying out our improvement, the motive wheels of the car being shown raised from the track; Fig. 2, a similar view showing the normal position of the means for carrying out our improvement, the car-wheels being on the track; and Fig. 3, a detail section at the line *x x* of Fig. 2.

Similar letters denote like parts in the several figures of the drawings.

We have shown our invention applied to a car whose motive power is electricity, the latter being utilized in accordance with what is known as the "trolley system." We would state, however, that it is immaterial, as far as our invention is concerned, whether the car be driven by an electric motor or otherwise, and we have therefore not illustrated the motor in any of its details.

It is a well-known fact that the great obstacle contended with in running a car by a local motor is that the demand on the motor when starting the car is enormous. Again it has heretofore been necessary in stopping the car to either stop the motor or to disengage the latter from the axle of the car. If the motor is stopped, then in starting the car an increased power is demanded, because the motor itself must be initially actuated. At the present time in car-motors such as are in general use the motor is always stopped in order to arrest the movement of the cars. Various means have been heretofore employed for engaging the motors constantly and permanently with the car-axle, such as a friction clutch or gearing. A positive means, as gearing, would have a decided preference were it not for the fact that the attempt to engage the revolving gear with the axle-gear invariably resulted in the stripping of the gear-teeth. Friction-clutches, as before stated, have been tried; but the wear thereon is so great and the result so lacking in uniformity and general satisfaction that said clutches have been renewed very often at great expense, annoyance, and loss of time. Our invention contemplates the permanent engagement of the motor with the axle of the car, so that not only are the motor and axle constantly revolving, but the inertia and other resistance to the starting of the car are reduced to a minimum.

1 represents an ordinary electric motor, and 2 a pinion which forms a part of the motor system and which is constantly revolved by said motor in any ordinary way.

3 is a gear rigid on the motive axle 4 of the car 5 and with which gear the pinion 2 is in constant engagement.

6 are levers pivoted at 7 to the body of the car and having at the other ends collars 8, through which the axle A extends loosely.

9 are levers having at the lower ends collars 10, through which said axle A extends loosely, and 11 is a bell-crank pivoted at 12 to the car-body and having forks 13 at its lower end, which are pivoted at 14 to the upper ends of the levers 9. The outer end of this bell-crank is forked and is pivoted at 15 to a nut 16.

17 is a rod, the lower end whereof is threaded and engages with said nut, while to the upper end is secured an ordinary crank-handle 18, convenient to the operator on the car-platform.

19 are stationary bearings through which the rod passes, and 20 are collars rigid on said rod and located close to said bearings on either side thereof, whereby said rod is stationary as to longitudinal movement.

B are auxiliary wheels mounted on the axle A, and preferably loose thereon.

The levers 9 and the bell-crank 11 constitute a toggle, the throw whereof is such that when straightened out, as shown at Fig. 1, the wheels B will be forced down upon the car-track with such power that the car will be jacked up, thereby raising the wheels 21 on the motive axle 4 clear from said track, as shown at Fig. 1. The wheels on the motive axle, being in the position shown at Fig. 1, are constantly revolving, so that when the wheels B are raised from the track by the reverse movement of the rod 17 the car will start with little or no extra demand on the motive power.

It is customary in the most approved methods to drive a car by a single motor, the latter being connected to one axle of the car, and we therefore have shown our invention applied to raise what are termed the "motive wheels" from the track; but our invention may be adapted to a car in such manner as to raise all the wheels of the same from the track, if desired, it being only necessary to place our improvement at each end of the car and to operate the toggles by means of a system of levers constructed and combined in any suitable and ordinary manner.

We have shown wheels carried by the axle A; but shoes may be used in this connection if desired.

We have also exemplified our invention by the employment of compound levers, and while our experiments and practical tests have convinced us that the raising of the car is very easily accomplished by the devices shown, still our invention is broader than any especial apparatus or construction, and we do not wish to be limited to the construction shown and described, our invention resting in the broad idea of jacking up the car so that the motive wheels are raised clear from the track. The wheels B, when in normal position, as shown at Fig. 2, barely graze the track, and the depression of said wheels to raise the motive wheels clear of the track is so slight that it cannot be detected by a looker-on. We have ascertained, moreover, that it is only necessary to raise the motive wheels eight one-thousandths of an inch from the track in order to serve the purposes of our invention.

Our invention furthermore contemplates the raising of the motive wheels themselves, the supports B in this instance being stationary, so that when said wheels are raised the weight of the car will come on said supports.

The impact of the wheels B on the track is sufficient to stop the car within a reasonable distance, and if shoes are used instead of said wheels the car can be easily stopped within its own length. However, our invention has reference to the elevating of the motive wheels of the car from the track prior to the stopping of the car, and the application of any ordinary or even special brake mechanism is of a secondary consideration.

We claim—

1. In a car the running-gear whereof is impelled by a local motor, the combination of the body of the car with instrumentalities for elevating the car bodily, whereby the motive wheels are raised clear from the track, substantially as set forth.

2. In a car the motive agent whereof is a motor carried by the car, the means herein described for facilitating the stopping of the car without arresting the revolution of the motor or motive car wheels, consisting in instrumentalities for raising the said wheels from the track, substantially as set forth.

3. In a car which is impelled by a local motor, the combination of an auxiliary pair of wheels or shoes supported by a system of compound levers at the end of the car and adjacent to the motive-car wheels, and means controlled by the operator for forcing said auxiliary wheels or shoes down upon the track, whereby the motive wheels are raised from said track, substantially as shown and set forth.

4. The combination of the car, the levers 6, and bell-crank 11, pivoted to the car-body, the levers 9, pivoted at their upper ends to the bell-crank, the axle A, extending loosely through the lower ends of said levers 6 and 9, the wheels B on said axle, the nut to which the upper end of said bell-crank is pivoted, and the threaded crank-rod engaging said nut and confined as to longitudinal movement, substantially as set forth.

5. In a car impelled by a local motor, the combination of auxiliary supports at the end of the car and in close proximity to the rails with means for raising the motive wheels clear of the track without arresting the revolution of said wheels, whereby the car will rest on said supports, substantially as set forth.

6. In a car impelled by a local motor, the combination, with the motive wheels, of a pair of auxiliary wheels supported at the end of the car in close proximity to the rails and in bearings capable of being depressed and elevated, and means for depressing and elevating said bearings, whereby the motive wheels are raised from the rails and deposited thereon, substantially as shown and described.

7. In a car impelled by a local motor, the means herein described for arresting the movement of the car without stopping the revolution of the motor or the motive car wheels, which consists in instrumentalities for raising said wheels clear of the track and for supporting the car independent of said wheels, substantially as set forth.

8. In a car impelled by a local motor, the means herein described for arresting the movement of the car without stopping the revolution of the motor or motive-car wheels, which consists in instrumentalities for raising and supporting the car independent of said wheels, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRIEND W. SMITH, JR.
SAMUEL S. WILLIAMSON.

Witnesses:
J. S. FINCH,
R. C. AMBLER.