No. 648,330. Patented Apr. 24, 1900.

J. C. ANDERSON.

MOTOR CAR.

(Application filed Oct. 28, 1899.)

(No Model.) 2 Sheets—Sheet 1.

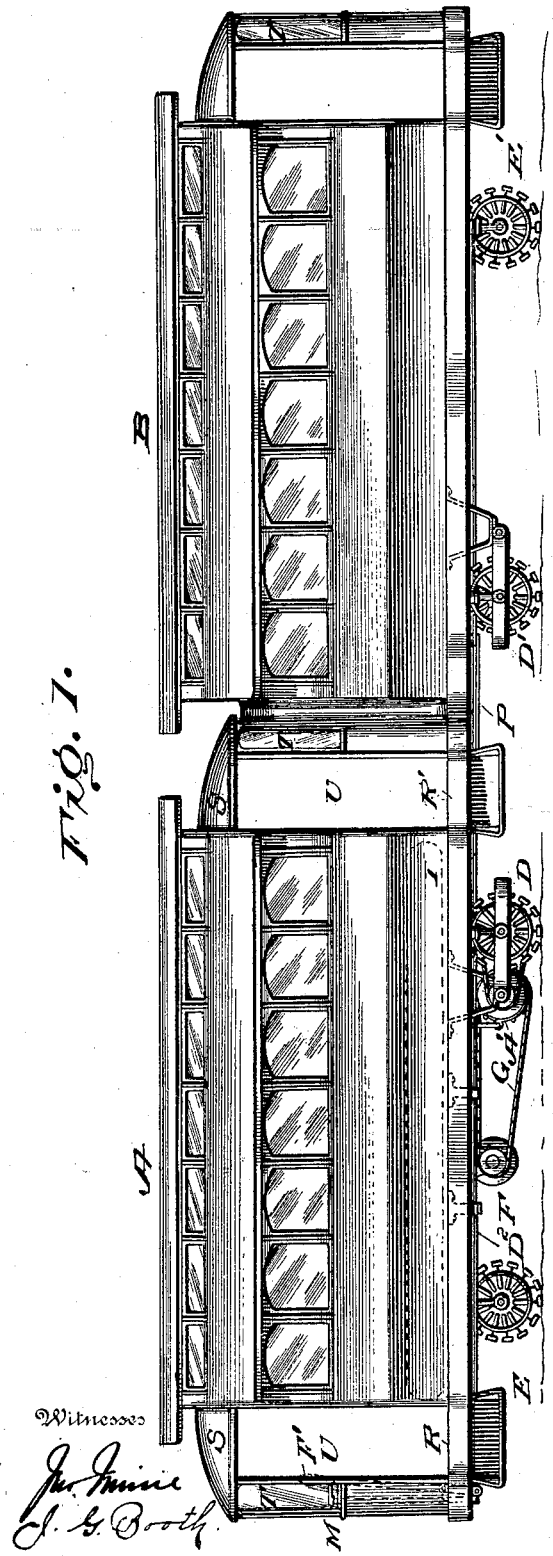

Fig. 1.

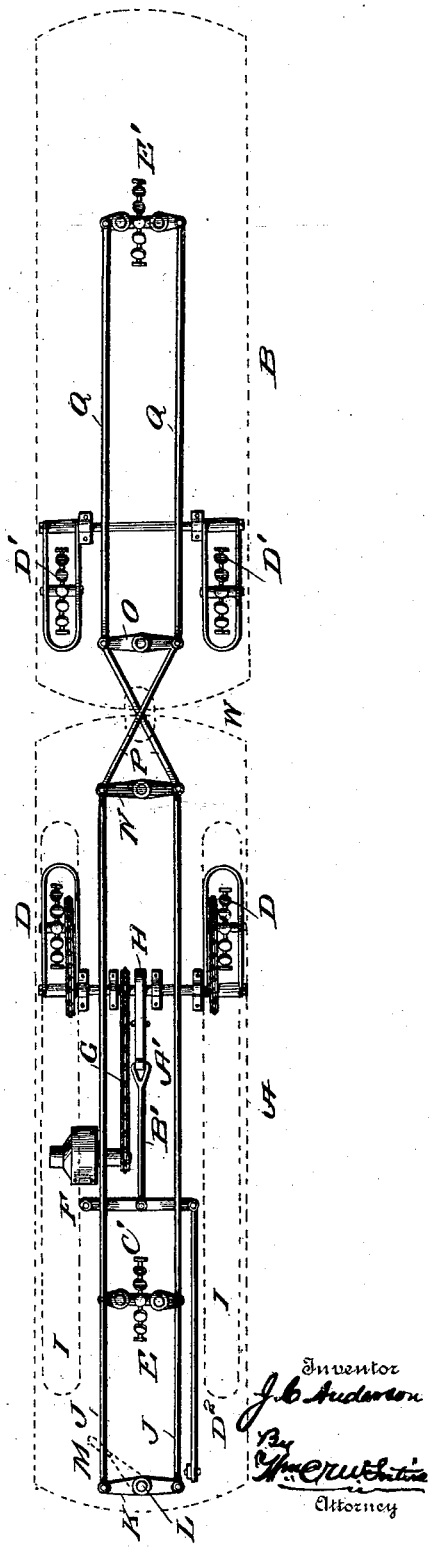

Fig. 2.

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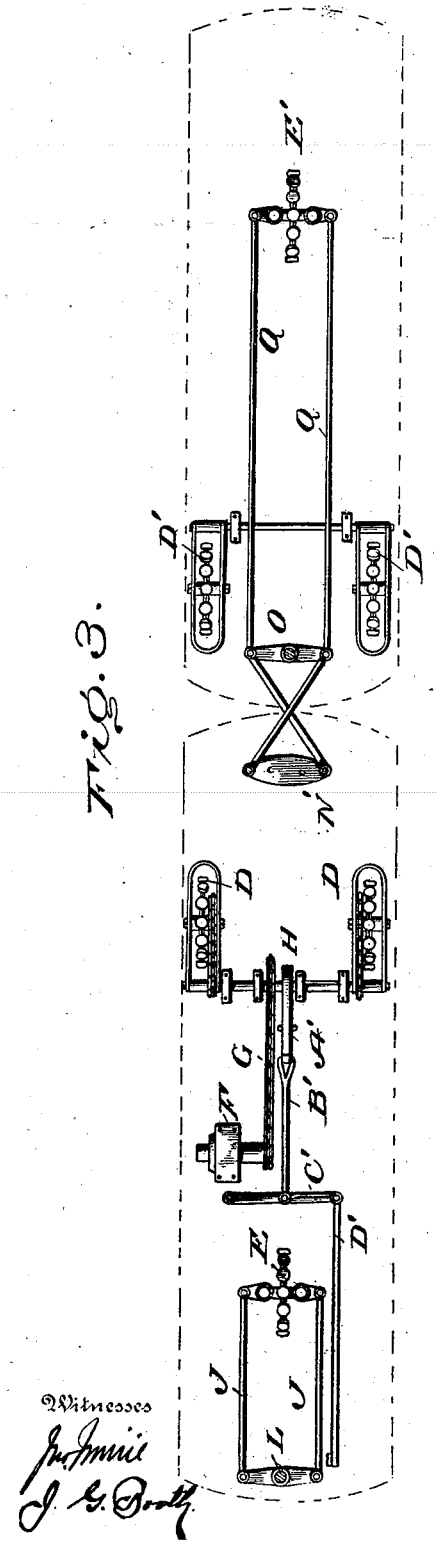

Fig. 3.

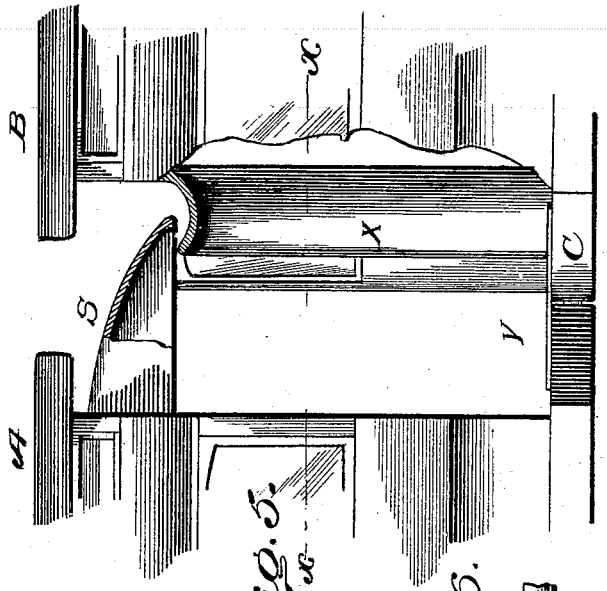

Fig. 5.

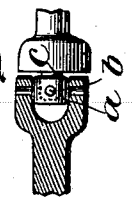

Fig. 6.

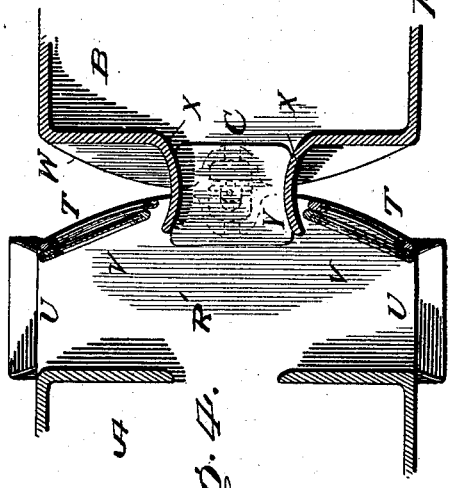

Fig. 4.

Witnesses

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MOTOR-CAR.

SPECIFICATION forming part of Letters Patent No. 648,330, dated April 24, 1900.

Application filed October 28, 1899. Serial No. 735,109. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. ANDERSON, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Motor-Cars; and I 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.

My invention relates to certain new and useful improvements in street-car construction, and particularly to that type illustrated and described in a pending application filed by me on the 5th day of September, 1899, Serial No. 729,484. In the application referred to I have shown and described a car having self-contained motive force and adapted to travel upon ordinary surface roads without the use of rails and especially adapted to turn corners by reason of peculiarly constructed and operating steering devices. In the car referred to steering-wheels are arranged at each end in the longitudinal center, and the driving-wheels are arranged each side of said center and midway between the steering-wheels. Hence the car is necessarily supported on four points of contact, and consequently the vertical undulation or vibration of the car-body is dependent upon the action of the supporting-springs.

My present invention has for its object to provide a construction which will enable the carrying capacity to be increased and at the same time to provide for vertical and transverse movements of the several sections or cars in order that they may readily adapt themselves to any inequalities in the profile of the roadway and to readily turn corners or curves.

It has also for its object to shorten the aggregate length of two or more cars in train without decreasing the carrying capacity and to provide a vestibule connection between the adjacent cars, whereby passengers in passing from one car to another may be protected from the elements in bad weather.

With these objects in view my invention consists in the construction and arrangement hereinafter more fully set forth.

In order that those skilled in the art to which my invention appertains may know how to make and use my improved street-car, I will proceed to describe the construction and operation of the same, referring by letters to the accompanying drawings, in which—

Figure 1 is a side elevation of two of my improved cars coupled together and constituting a motor and trailer. Fig. 2 is a plan view of the running-gear and means for driving and steering the cars, the dotted lines indicating the body of the cars, and cylinders for containing compressed air or other motive force. Fig. 3 is a similar view but showing a modification of the steering devices. Fig. 4 is a horizontal section taken at the line $x\,x$ of Fig. 5. Fig. 5 is a detail elevation, partly in section, of the adjacent ends of the motor-car and the trailer and showing the vestibule connection; and Fig. 6 is a detail plan view of the preferred coupling used for coupling the cars together.

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

A is the motor-car, and B the trailer, which are coupled together by the usual or any preferred coupling devices C.

D D are the driving-wheels, and E and E′ are the steering-wheels, of the leading or motor car A and the trailer B.

F is a motor of any suitable kind, which is adapted through suitable connections to be controlled by the motorman on the front car and geared by a sprocket-chain G with a suitable differential transmitter H for transmitting motion to the driving-wheels D.

I I are reservoirs for containing compressed air or other motive agent and suitably connected with the motor, all substantially as described in the pending application hereinbefore referred to.

The rear or trailing car is provided with two carrying-wheels D′, arranged under the forward end of the car, and the steering-wheel E′ is arranged centrally under the rear end of said car.

The construction of the wheels and their connection with the cars are preferably such as described in the pending application referred to, and in lieu of the single steering-wheels E and E′ double steering-wheels may be used, as shown and described in another pending

application filed by me on the 23d of September, 1899, Serial No. 731,462 for "autotruck-vehicles."

J J are steering-rods pivotally connected to the ends of a vibrating lever K, pivoted centrally to the bottom of the motor-car A and operated through the medium of a rock-shaft L and hand-lever M. These steering-rods J are pivotally connected to the opposite sides of the steering-head of the steering-wheel E and extend to near the rear end of the car, and their rear ends are pivoted to the ends of a vibrating bar N, which is pivoted centrally to the bottom of the car. The rear or trailing car B is provided with a pivoted bar O, similar to N, and the two bars N and O are connected by bars P, which are crossed and pivoted to the bars N and O, as clearly shown.

Q Q are steering-rods, which are pivotally connected at their forward ends with the vibrating bar O and at their rear ends to the steering-head of the steering-wheel E', all as clearly shown at Fig. 2.

From the construction shown it will be seen that when the hand-lever M is operated to rock the shaft L the steering-rods J J will cause the steering-wheel E to be turned on its tangential axis and that through the medium of the vibrating bars N O and rods P P and Q Q the rear steering-wheel will be swiveled in a direction reverse to the forward steering-wheel E, and as the front end of the motor-car A is guided in one direction on an arc commensurate with the degree the wheel E is swiveled the rear end of the trailer-car will be guided in the opposite direction upon precisely the same arc, the paths of the two wheels, if continued, describing a true circle, the center of which would be at a point midway between the axis of the two wheels E and E'. At the same time that the two cars are being thus steered the pivotal connection between the steering-rods J J and Q Q and the pivotal connection of the coupling C will permit the adjacent and coupled ends of the two cars to freely articulate on the vertical axis of the coupling.

Having described the manner in which the two cars are coupled together and properly steered, I will now describe the platform and vestibule construction.

The motor-car A is provided with a front platform R and a rear platform R', substantially alike and with a roof or hood S over the same. The projecting ends of the platforms are curved, and the spaces between the platforms and the roofs or hoods S are closed and provided with suitable windows, and spaces U are provided for side doors V, which may be closed and when open permit free ingress and egress. The doors when open swing back out of the way, as clearly shown at Fig. 4. The rear platform R', as before stated, is substantially like the forward one R, with the exception that in addition to side openings for ingress and egress of passengers a central passage-way or opening, as clearly shown at Fig. 4, is left to receive a short vestibule projecting from the front end of the rear car, as will be presently explained.

The rear or trailer car is formed with a rear platform, substantially like the rear platform of the motor-car, and may be utilized as a smoking-compartment when not in use for receiving and delivering passengers.

The front end of the rear car is formed without any platform or hood, but in lieu thereof is provided with a curved sill W (see Fig. 4) and a forwardly-projecting short passage-way or vestibule, the side walls and top of which are curved or flared, as clearly shown in Figs. 4 and 5, and adapted to enter within the inclosed space over the rear platform R' of the motor-car and sufficiently far under the projecting hood or roof S in order that the curved or gutter-shaped top of the extension will not only close the space at that point, but will serve as a conduit for any drippings which may fall from the roof or hood S. The side walls X likewise close the space between them and the vertical edges of the space or opening through which they pass, and the flare or curvature of the side walls X, as well as that of the top portion, permit the vertical and lateral movements of the ends of the two cars relatively to each other.

The coupling shown at Fig. 6 consists of two draw-bars, which are rigidly attached to the respective cars. One of said draw-bars is provided with a knuckle *a*, pivoted horizontally between the jaws of said draw-bar and provided with a vertical circular opening to receive an ordinary coupling-pin *b*, and the front end or face of this knuckle is formed with a pocket or recess, as shown by dotted lines. The other draw-bar is formed with a flat tongue or projection *c*, formed with a vertical channel near its end to receive the coupling-pin *b*, and is adapted to enter the recess in the knuckle *a*, as clearly shown.

From the construction it will be seen that the coupling-pin permits the two draw-heads to oscillate laterally upon it as a center and that the knuckle *a* permits said draw-heads to oscillate in a transverse direction. The plane of connection between the two draw-heads is the true axis of motion between the two cars, and said point will when the cars are traversing a curve under the influence of the steering devices always traverse a path concentric with that traversed by the two cars. When the motor and trailer cars are thus connected, it will be seen that two cars have three entrances on each side and that while the seating capacity is not reduced the aggregate length of the two cars is lessened by the absence of a platform on the forward end of the trailer.

The joint or space between the sill W and the platform T is closed by an overlying footboard Y.

At Fig. 3 I have shown a modification of the steering devices, and instead of extend-

ing the steering-rods back from the steering-wheels E of the motor-car to a vibrating bar N they terminate at the steering-head of the wheel E, and in lieu of the vibrating bar N, I employ a rigid bar N′, fastened in place by bolts, and connect the crossed rods P pivotally to said bar N′ and to the pivotal bar O and employ steering-rods Q, the same as shown in Fig. 2. From this construction it will be seen that as the motor-car A is turned in one or the other direction the drag on the ends of the respective crossed bars P caused by the rigid bar N′ will correspondingly vibrate the bar O, and through the medium of the steering-bars Q the rear steering-wheel will be swiveled to the proper degree to cause the rear car to traverse the path of the forward car, thus relieving the motorman from the necessity of exerting the physical force necessary to swivel both the front and rear steering-wheels, as would be the case with the construction shown at Fig. 2.

A brake A′ is connected with the differential power-transmitter H and is operated through the medium of a hook-rod B′, a vibrating bar C′, pull-rod D^2, and a hand-lever F′, as fully illustrated and described in the pending application for improvement in motor-cars, hereinbefore referred to.

While I have shown the motor-car with a forward inclosed platform and the rear or trailer car with a rear inclosed platform, it will be understood that these platforms may be open and of the usual construction without in any manner affecting the advantages secured from the vestibule connection described at the coupled ends of the two cars. Likewise lateral entrances at the front end of the forward car and the rear end of the trailer-car may be dispensed with and the single lateral entrance on each side between the cars utilized for ingress and egress of passengers.

It will be understood that while I have shown the rear car provided with the vestibule extension adapted to enter the rear inclosed platform of the forward car the construction may be reversed—that is to say, the rear car may have a forward inclosed platform and the forward car provided with the vestibule extension at its rear end.

It will of course be understood that either car may constitute the motor-car or that both may be provided with driving-wheels and driving mechanism. It will also be understood that by reason of the conformation or flare of the sides X of the vestibule the footboard Y, with its opposite edges correspondingly curved, does not require any extraneous fastening devices to hold it in proper relation with the joint or space between the platform R′ and sill W. Many other changes may be made in the various details of construction without departing from the spirit of my invention, the gist of which rests in the broad idea of a motor-car provided with a central forward steering-wheel, rear driving-wheels, and means for driving the latter, and having a front and rear inclosed platform and a trailer-car provided with forward carrying-wheels, rear steering-wheel, and with a rear inclosed platform and a projecting vestibule X, adapted to enter an open space within the rear inclosed platform of the motor-car, the two cars being capable of vertical and lateral oscillation at a point constituting the true axis of vibration of each car, the forward end of the motor-car and the rear end of the trailer adapted to be steered through substantially the same path, as hereinbefore explained.

What I claim as new, and desire to secure by Letters Patent, is—

1. A motor-car mounted upon a forward steering-wheel and rear driving-wheels and provided with mechanism for steering the forward wheel, and mechanism for driving the rear wheels, and a trailer-car mounted upon forward carrying-wheels and a rear steering-wheel and provided with mechanism for steering the rear wheel, the forward and rear cars, coupled together, whereby the two cars are adapted to be steered through a common path, substantially as hereinbefore set forth.

2. A motor-car provided with a forward and a rear inclosed platform, and a trailer-car coupled to the motor-car and provided with a rear inclosed platform and a forward projecting vestibule adapted to enter a suitable distance within a space in the rear, inclosed platform of the motor-car to constitute a closed passage-way between the two cars, and at the same time, permit oscillation of each car relatively to the other, as hereinbefore set forth.

3. A forward or motor car provided with front and rear inclosed platforms and a rear or trailer car provided with a rear inclosed platform and a forward projecting vestibule adapted to enter the rear inclosed platform of the forward car, whereby a single lateral entrance on each side and an inclosed passage between the cars, are provided without decreasing the seating capacity of either car, substantially as hereinbefore set forth.

4. In combination with a motor-car provided with a rear inclosed platform, a rear or trailer car provided at its front end with a forwardly-projecting vestibule having the sides and top thereof flared outwardly and adapted to enter the rear inclosed platform of the motor-car, the adjacent ends of said cars being articulatively coupled together, substantially as and for the purposes set forth.

5. Two or more cars coupled together to constitute a train, the coupled cars at their adjacent ends provided one with an inclosed platform and the other devoid of a platform and provided with a projecting vestibule adapted to enter the inclosed platform of the other car and to constitute a protected passage-way between said cars, substantially as hereinbefore set forth.

6. A combination-car composed of a forward motor-section and a rear trailer-section articulatively coupled together, and provided

with lateral entrances at the forward end of the motor-section and the rear end of the trailer-section, and a single lateral entrance between the adjacent coupled ends of the two sections, substantially as and for the purpose set forth.

7. A forward and a trailer car coupled together by draw-heads or equivalent devices rigidly connected to the respective cars and with an intermediate joint adapted to vertical and lateral articulation, whereby the axis of motion between the cars in either direction is always at a fixed locality and longitudinal movement of one car with reference to the other is prevented, substantially as hereinbefore set forth.

8. In combination with two cars coupled together and each provided with steering-wheels, one of said cars provided with hand controlling mechanism for operating its steering-wheel, and means intermediate of the two cars, and independent of the hand controlling mechanism for automatically controlling the steering movement of the other steering-wheel, substantially as hereinbefore set forth.

9. In combination with the cars A and B coupled together and connected by the inclosed platform R′ and extension or vestibule having flared or curved side walls X, the footboard Y having its opposite edges conforming with the side walls X and held in position to close the joint or space between the platform R′ and sill W, substantially as hereinbefore set forth.

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

JAMES C. ANDERSON.

Witnesses:

JENNIE G. BOOTH,

JNO. J. HARROWER.