3 Sheets—Sheet 1.

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Car Truck.

No. 2,071. Patented May 4, 1841.

Fig. 1.

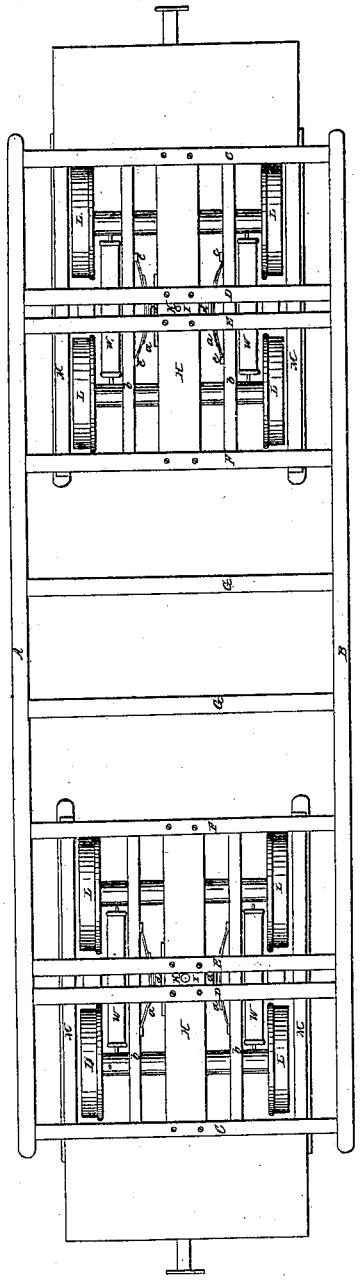

Fig. 2.

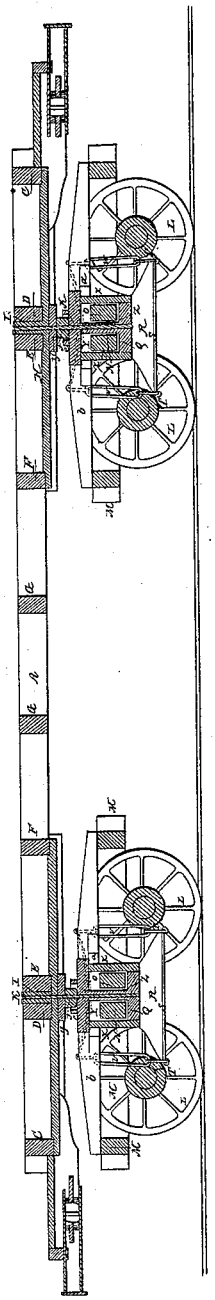

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Fig. 13.

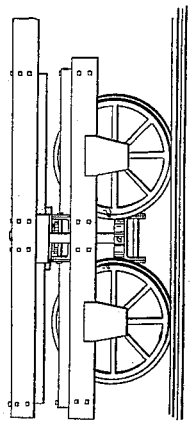

Fig. 14.

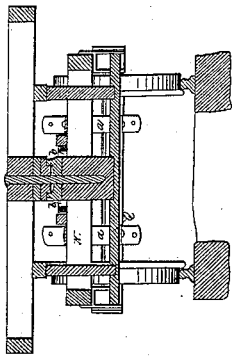

Fig. 12.

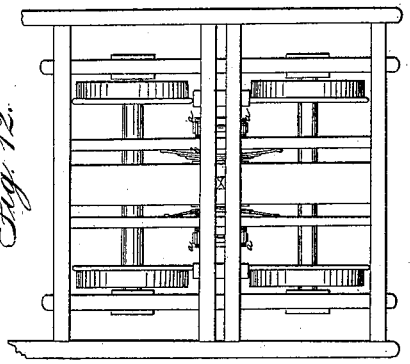

Fig. 9.

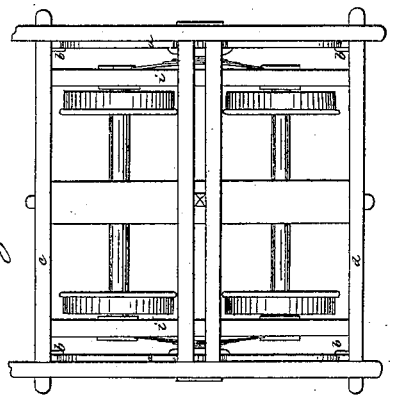

Fig. 10.

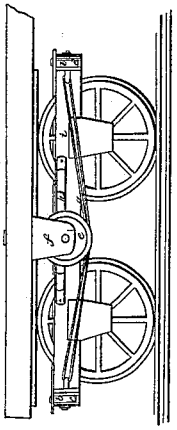

Fig. 11.

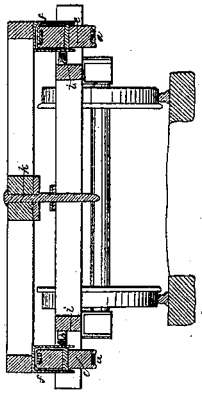

Fig. 6.

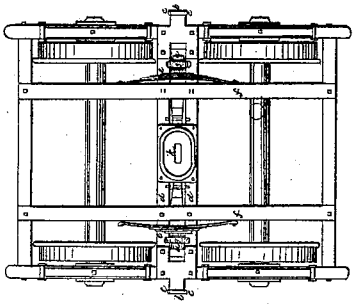

Fig. 7.

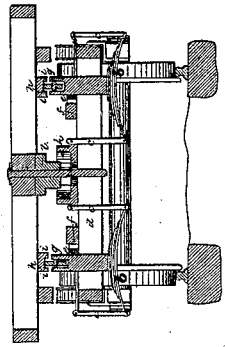

Fig. 8.

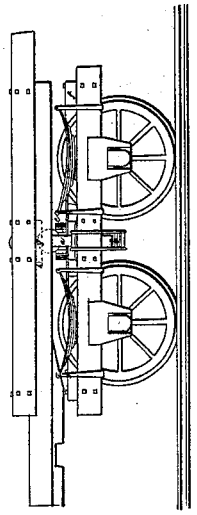

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Fig. 4.

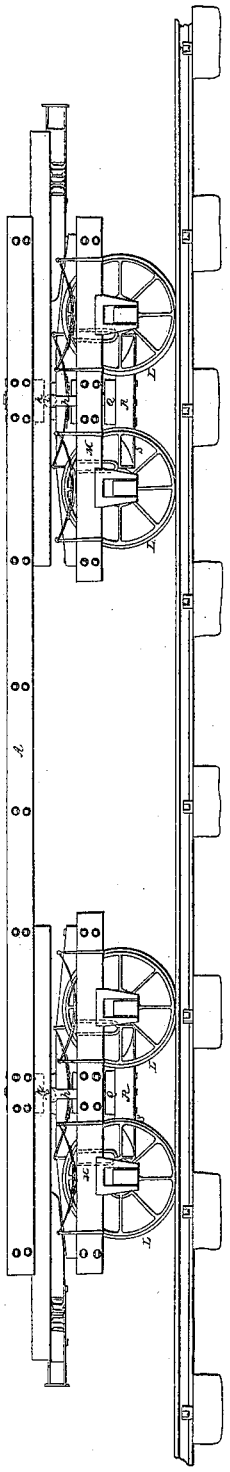


Fig. 6.

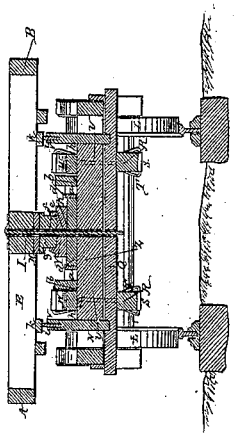
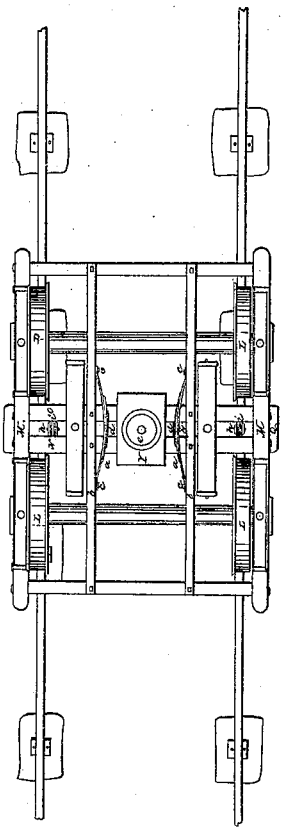


Fig. 5.



UNITED STATES PATENT OFFICE.

CHARLES DAVENPORT AND ALBERT BRIDGES, OF CAMBRIDGEPORT, MASSACHUSETTS.

MANNER OF CONSTRUCTING RAILROAD-CARRIAGES SO AS TO EASE THE LATERAL MOTION OF THE BODIES THEREOF.

Specification forming part of Letters Patent No. 2,071, dated May 4, 1841; Reissued December 3, 1850, No. 183.

To all whom it may concern:

Be it known that we, CHARLES DAVENPORT and ALBERT BRIDGES, both of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented a new and useful improvement in railroad-carriages by which the inconvenience to passengers arising from the sudden lateral motion of the wheels on the rails is obviated, and that the following is a full and exact description of the same, reference being had to the accompanying drawings, which, taken in connection herewith, form our specification, setting forth the principles of construction of our improvement by which it may be distinguished from others of a like character, and such parts or combinations as we claim to be our invention and for which we desire an exclusive privilege for fourteen years to be secured to us by Letters Patent.

Most persons, who travel by railroad, experience a continual repetition of sudden jars or shocks, arising from the side way movement of the flanches of the wheels of the car, against the rails of the track, and so extensive are the evils of their frequent shocks, that besides being greatly to the discomfort of the passengers, preventing them almost entirely from reading while traveling in this manner it is highly injurious to the carriages causing the joints and other parts to become loose and soon deranged.

The object of our improvements is to obviate the effects of the above lateral motion by springs suitably arranged and which we now proceed to explain.

Figure 1, of the drawings herewith presented represents a top view of the frame and wheels of an eight wheel carriage, the body being removed therefrom. Fig. 2, is a vertical longitudinal section of the above. Fig. 3, is a transverse vertical section, taken centrally between either of the two axles of each set of four wheels. Fig. 4, is a side elevation of the frame and running machinery on which the carriage rests. Fig. 5 is a top view of the latter detached from the frame above the same.

The supporting frame upon which the body is placed consists of two side beams A, B, (see the different drawings), united at suitable distances by transverse ties, C, D, E, F, G—G, F, E, D, C, whose ends are mortised into, or otherwise properly secured, to the beams. It will be perceived by inspection of Figs. 1 and 2, that the second and third ties from each end, viz., D, E, are placed at a small distance apart, in comparison with the other. Under the beams C, D, E, F, is a central and longitudinal plank H, extending from the first tie C to the fourth F, and well secured thereto, and to the central ties D, E, by bolts or otherwise. As our improvement is connected to both systems of driving wheels, it will be sufficient to explain its application to either. The ties D, E are connected together, in the center by a block I, inserted between them, and resting on the top of the plank H, and through this block the long bolt K is passed, which connects the wheels to the carriage. The wheels L, L, L, L, are connected to the frame M, in the usual manner. The said frame is rectangular, being suitably constructed for the purpose for which it is intended. The outer or side beams of the frame have two transverse beams N, O, extending between them, and situated at a suitable distance apart, to permit the standards, of a cross beam or wide plank Q, to play vertically between the same. The plank Q, extends under the frame M, and between the wheels as represented in the drawings and has two cross bars K, K, Fig. 2, applied at right angles to its underside. Metallic springs or plates S, S are bolted to the underside of the bars R, R, to the ends of which springs common shackles or loops T T are applied, from which shackles, suspension links U, U, or other similar contrivances, extend upward as seen in Figs. 2, 3 and connect with the loops V, V of common semielliptic springs W, W, suitably applied to the top of the transverse beams N, O, as seen in Figs. 1, 4. Two iron standards or planks X, X, Fig. 2, of sufficient width, are bolted to the opposite sides of the plank Q and extend upward perpendicularly therefrom, somewhat above the tops of the beams N, O, as seen in the drawing, and are connected together at their tops by a strong iron plate or longitudinal plank Y. A deep plank or standard Z, also rests or is bolted upon the upper edge of the plank Q, its position being seen in Figs. 2, 3. The width of this plank Z is about the same as the distance between the beams

N, O, it being so arranged as to move vertically between the same. The cross plate Y also rests directly upon the plank Z as seen in Figs. 2, 3, 5. Two semi-elliptic springs *a*, *a*, Figs 3, 5, are suitably arranged on the inner sides of longitudinal beams *b*, *b*, Figs. 2, 3, 5, their ends passing under staples *c*, *c*, inserted in the sides of the beams *b*, *b*, or being otherwise properly connected thereto, so as to support the springs and permit them to operate as required. The upright guiding plank Z, has a shoulder *d*, Figs. 3, 5, formed thereon, on each side of the plate Y, each of which shoulders abuts or rests against the center of one of the springs *a*. The top of the plate Y has a suitable circular step, *e*, cast thereon which receives a circular pivot *f*, projecting from a plate *g*, applied to the underside of the plank H, the bolt K passing downward through the pivot and its step, as seen in the drawings. Two standards *h*, *h*, Figs. 3, 4, 5, are arranged on the plank Q, between the beams N, O, outside of the springs W, W as seen in the drawings. Small vertical friction wheels *i*, *i*, are placed in the tops of these standards, and small rail pieces *k k*, to rest on said friction wheels, are bolted to the lower sides of the two beams D, E. From the above it will be seen, that the carriage rests upon the plate Y and the friction wheels, or in other words, by means of the intervening parts, on the springs W W, so that its perpendicular movements are relieved by the said springs. The connection of these springs with the lower springs or plates S S, on the cross bars R R, by means of the suspension links U, U, admits a pendulous or lateral motion of the plank Q and consequently the carriage is thus permitted to move sidewise. When this takes place, one of the shoulders *d*, *d*, is pressed against the adjacent spring *a*. Therefore whenever there is lateral motion of the wheels, so that their flanches strike suddenly against the side of the rail, any unpleasant effect of the same, on the carriage and passengers, is rendered imperceptible, by the relief afforded by the springs *a*, *a*. The running machinery is permitted to adapt itself to curves of the railway, by means of the circular step *e* and pivot *f*, and the carriages of the train are connected together in the usual manner, by the common spring and buffing apparatus, which is represented in the drawings, as applied to each end of the carriage frame.

Figs. 6, 7, and 8, exhibit another disposition of the springs and other parts for relieving the shocks resulting from the lateral motion. Fig. 6 is a top view of the running machinery. Fig. 7 is a transverse section and Fig. 8, is a side view of the same, with the carriage frame resting thereon. By this arrangement it will be perceived that the standards *a*, *a*, Figs. 6, 7, 8, (upon which the carriage frame rests and in the tops of which are the small friction wheels *g g* as before described) are supported and secured upon the central part of semi-elliptic springs *b b*, arranged transversely and between the wheels or under the cross beams *d d* and supported at their ends by the suspending links *c*, *c*, hung from proper hinged bearings applied to the top of the cross beams *d d*. The springs *e*, *e*, which relieve the side shocks are placed on the outer side of each of the parallel and longitudinal beams *f f* so that their central parts shall rest against the inner side of the standards *a*, *a*, and their ends bear against and be properly affixed to the outer sides of the beams *f f*. In this case each of the friction wheels *g g* in the top of the standards *a*, *a*, should play in a grooved block or plate *h*, Fig. 7, applied to the underside of the carriage frame the sides *i i* of the groove serving as shoulders to keep the respective parts of the machinery in place while the carriage is running. This particular arrangement of the springs requires that the step *k* in which the pivot *l* of the carriage rests as before described and which in this instance is bolted to the top of the cross beams *d d*, should be elongated transversely as seen in Figs. 7, 6, instead of circular so as to allow of the play or lateral movement of the running machinery under the carriage.

Figs. 9, 10 and 11 exhibit another method of connecting the carriage frame to the running machinery, the former figure representing a top view of the frame and parts under the same. Fig. 10 is a side elevation and Fig. 11 a transverse section of the above. The frame of the carriage is here supported on strong leather thorough braces *a a*, Figs. 10, 11, placed on each side of the frame and whose ends are supported by staples *b b*, properly secured to the ends of the cross beams *c*, *d*, Fig. 10. The carriage rests on these thorough braces, by means of the strong friction wheels or rollers *e*, *e*, Figs. 10, 11, moving in bearings *f f* applied to the undersides of the outer beams *g g* of the carriage frame. The elliptic springs *h h* Figs. 9, 10, 11, for relieving the side shocks, are placed directly behind each of the friction or bearing rollers, or between them and the sides *i i*, of the frame, to which the wheels are attached. The springs are curved outward as seen in Fig. 9, having their centers resting against the bearing of the friction wheels, and their extremities suitably attached to and resting against the sides *i i* of the wheel frame. Now as the thorough braces permit the running machinery to move sidewise, independent of the carriage or carriage frame, the springs *h h* will counteract the force by which the flanges of the wheels impinge upon the rails, and prevent any inconvenience to the passengers

therefrom. When the wheels run over a curve in the railway, they will easily adapt themselves to the same, for as the frame to which they are attached, turns on the center bolt or pin *k*, the rollers or wheels *e e* will move a short distance over the upper surface of the thorough braces, and when the wheels pass from a curve to a straight line they will return to their former position.

In freight and many other cars the method above described of sustaining the carriage frame by suspending links, connected with springs, may be often dispensed with, and the suspending links may be employed without springs, as will be seen by reference to Figs. 12, 13, 14, the former being a top view of the carriage frame and running machinery under the same, while Fig. 13 is a side elevation, and Fig. 14 a transverse section of the above. In this case, the construction would be every way substantially similar to that exhibited in Figs. 1, 2, 3, 4, 5, and herein first described, with the exception that the springs *w w*, Figs. 2, 3, would be omitted, and the plank Q supported in position by suspending bars *a*, *a*, Figs. 13, 14, 12, applied to opposite sides of the central beams, one of which beams, viz., N, is shown in Fig. 14. The suspending bars are suitably hung at their tops by proper supports, applied upon the upper surfaces of the center beams, which supparts are to be of such character as to permit these bars to swing or have a pendulous motion transversely, that is to say, in a direction perpendicular to the railway. They are also connected to the plank Q, by a similar arrangement, so that the plank Q and the cross beams, will always be parallel with respect to each other, during the vibratory movements of the former. The springs for counteracting the side shocks are represented at *b b*, Fig. 12.

Having thus described our improvements, we shall claim,—

Supporting the carriage, or body of the same, upon, or connecting it to, the wheel frame, by means of thorough braces or pendulous bars or links, either suspended or not, at pleasure, to springs on the wheel frame, and arranged according to the modes above represented, (all of which modes permit a lateral motion of the running machinery, independent of the body of the carriage), in combination with the side springs, opposed to said lateral motion, and which are disposed and operate substantially in the various ways described, the whole being for the purpose of preventing the injurious and unpleasant effects, resulting to the car and passengers or goods therein, from the sideway movements of the flanges of the wheels against the rails of the track, as hereinbefore set forth.

In testimony that the above is a true description of our said inventions and improvements we have hereto set our signatures this twelfth day of April in the year eighteen hundred and forty one.

CHARLES DAVENPORT.
ALBERT BRIDGES.

Witnesses:
R. H. EDDY,
CALEB EDDY.

[FIRST PRINTED 1913.]