S. B. DRIGGS.

Car Truck.

No. 46,784. Patented Mar. 14, 1865.

Fig. 1.

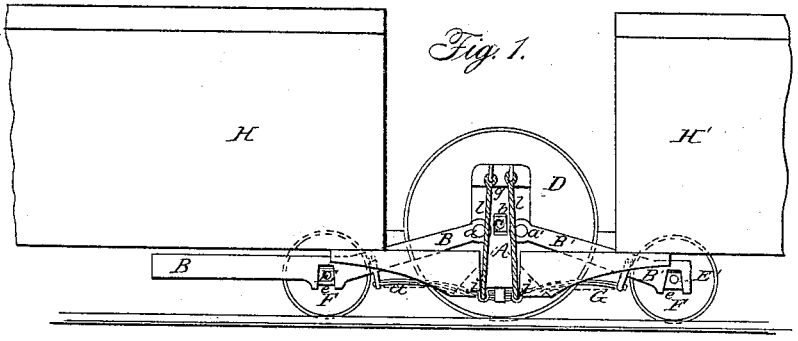


Fig. 2.

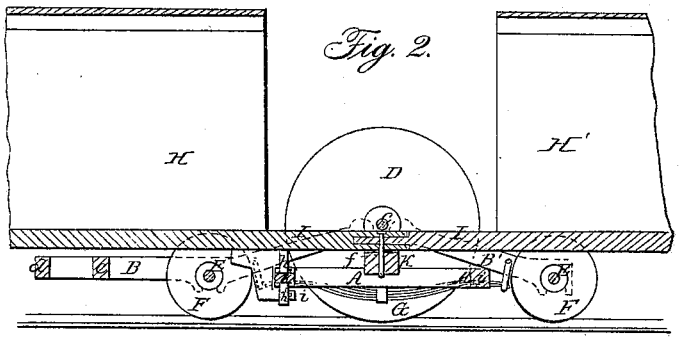


Fig. 3.

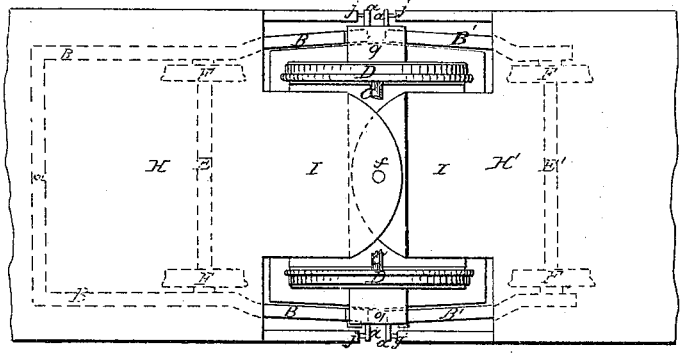
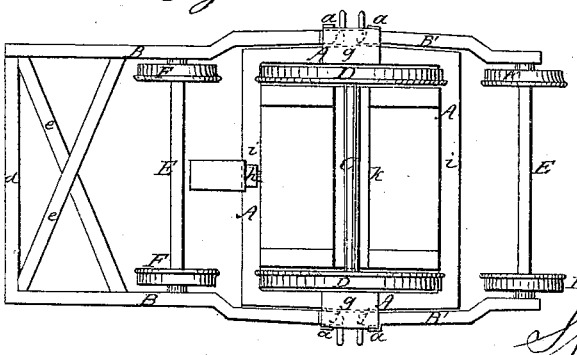


Fig. 4.



Witnesses:

Henry F. Brown

Gold Reed

Inventor:

Spencer B. Driggs

UNITED STATES PATENT OFFICE.

SPENCER B. DRIGGS, OF NEW YORK, N. Y.

IMPROVEMENT IN RUNNING-GEAR OF RAILROAD-CARS.

Specification forming part of Letters Patent No. **46,784**, dated March 14, 1865.

To all whom it may concern:

Be it known that I, SPENCER B. DRIGGS, of the city, county, and State of New York, have invented a new and useful Improvement in the Running-Gear of Railway-Cars; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of the connected ends of two cars having my improved running-gear applied. Fig. 2 is a central longitudinal vertical section of the same. Fig. 3 is a plan of the same. Fig. 4 is a plan of what I call the "flexible truck," which supports the ends of two cars.

Similar letters of reference indicate corresponding parts in the several figures.

The principal object of my invention is to enable railway-trains to be run at the highest practicable speed with the same safety that they are now run at ordinary speeds, and without the enormous increase of wear and tear of track and rolling-stock which result from a high rate of speed with the running-gear at present in use; and it consists in a novel system of running-gear and car-connections, whereby I consider this desirable result will be obtained.

To enable others skilled in the art to make and apply my invention, I will proceed to describe it with reference to the drawings.

A B B′ is what I term a "compound flexible truck," composed of three principal parts, viz: What I call the "main truck," A, consisting of a strong and rigid frame, and two guide-trucks, B B′, which are pivoted to the main truck A near the middle of the length thereof by horizontal pivots *a a*, and project some distance beyond the front and back thereof. The main truck A is suspended by means of axle-boxes *b b* and springs at each side in such manner as to be balanced from the axle C of the pair of wheels D D, which are of much larger diameter than ordinary car-wheels, say about five feet. These wheels are flanged in the usual or any suitable manner to keep them on the track, and the springs employed on the top of the axle-boxes may be the ordinary india-rubber car-springs, or of any suitable kind, and therefore I have not thought it necessary to represent them in the drawings. The guide-trucks B B′ are each furnished with an axle-box, *c*, at each side for the reception of one of two axles, E E′, each of which is furnished with a pair of wheels, F F, of about the same size as the car-wheels commonly employed. These wheels F F, like D D, are flanged in the usual or any suitable manner, and springs, such as are commonly used in railway-cars, are to be applied above their axle-boxes *c c;* but these springs are not represented in the drawings. The axles E E′ may be as near to the main axle C as will allow the two pairs of wheels F F to work without the possibility of their ever coming in contact with the main wheels D D.

G G are springs, of semi-elliptic or other suitable construction, arranged lengthwise of the truck, one on each side, each attached at the middle of its length to the main truck A, under its axle C, and at its ends to the guide-trucks B B′, one end to each of the latter. These springs are of such strength that when the connected ends of two cars, H H, are suspended from the main truck a sufficient portion of the weight of the cars—say, from four hundred (400) to six hundred (600) pounds—may be transferred from the main to each of the guide trucks to keep the wheels F F of the latter firmly pressed upon the rails, but the weight is desired to be, as much as practicable, brought upon the large main wheels D D. Said springs may and should preferably be so connected with the main truck, by pins or otherwise, that either end may rise and fall freely independently of their elasticity to accommodate themselves to any rising and falling of the guide-wheels F F in passing over inequalities in the track. Each guide-truck may either have its sides unconnected and independent of each other, as shown in B′ in Figs. 3 and 4, to allow their wheels to rise independently of each other in passing over inequalities in the track, or rigidly connected by transoms *d* and diagonal braces *e e*, as shown in B in the same figures, and the said trucks may be so connected with the main truck as to give the whole truck a little flexibility in either direction laterally besides the flexibility in a vertical direction afforded by the pivots *a a;* but I do not think that this lateral flexibility will be necessary, except on

railways on which there are very short curves, if the wheels F F of the two guide-trucks are brought as near as practicable to the main wheels and to each other.

The car-bodies H H′ may be of the usual construction, with a platform, I, at each end; but in order to make room for the large wheels D D, which could not work under the bodies, the platforms I I are made sufficiently narrower than the bodies, as shown in Fig. 3, to allow the said wheels to work on each side of them, as shown in Fig. 2. The bodies are supported by being suspended at the extremities *j j* of their sides by chains, links, or wire ropes *l l*, or other flexible means of suspension from elevated portions *g* of the main truck A, as nearly as practicable over the main axle, C. These chains, ropes, or links are arranged to occupy slightly-inclined positions when the cars are running on a straight portion of the track, and hence in turning a curve the approach of the points of attachment *j j* of two connected cars on the inner side of the curve will bring the said cords, links, or chains to, or more nearly to, a vertical position, and so cause the car to be somewhat lowered on that side, while the departure or further separation of the corresponding points of attachment on the outer side of the curve will cause the said cords, links, or chains to assume a greater inclination or depart farther from vertical positions, and so raise the cars on that side. In this way the cars receive in turning a curve a lateral inclination, by which the effect of the centrifugal force developed in running round a curve is in a measure counteracted.

The connections between every two cars of a train are made by means of vertical coupling bolts or pins *f*, fitted snugly into holes provided for their reception in the ends of the two cars, in line with the centers thereof and directly over the center of the track, and passing through the center transom, *k*, of the main truck. These coupling-pins *f*, while they provide for that flexibility of the train which is desirable for turning curves do not permit any lateral motion of the connected ends nor any longitudinal motion of the cars relatively to each other, and cause all of the cars in a train to stop and start together without any of the jerks and bumps which occur in the starting and stopping of trains of cars connected by the couplings commonly employed. The axis of the coupling pin is in the same plane with that of the main axle C and wheels D D. The connection of the cars by this coupling-pin is represented in the drawings as being below the main axle C, but it may be above the main axle. In order to prevent any unequal dipping or depression of either end of the main truck when a car is detached from the train, or when one car is more heavily loaded than the next one, there are represented attached to and under the center of the bottom of the body of the car H two friction-rollers, *h h′*, Figs. 2 and 4, to receiv esnugly between them the end transom, *i*, of the main truck, the axes of the said rollers being parallel with the length of the car.

Having now described the construction of and mode of applying my improved running-gear, I will proceed to describe its operation and advantages by which the great wear and tear both of the rolling-stock and track which attends the running at high speeds with the ordinary running gear is obviated.

The cars of a train, being all coupled, together firmly, resemble one continuous but flexible car, and the jerks and bumps which take place in running, and more especially in stopping and starting, when the ordinary couplings are used are prevented; and, as the cars are suspended at their extreme ends and the connection between every two, and the connection of each with the main or supporting truck A, is made at the center of the end of each car, in the same plane with the axis of and midway between the large supporting-wheels D D, each pair of which form the main support of the ends of two cars, and which are always kept parallel with the track by the two pairs of guide-wheels F F, I believe there will be no lateral motion of either the cars or trucks beyond what is absolutely unavoidable in turning curves. In the cars now commonly used, supported at some distance from either end on two trucks, each having four or six wheels, the lateral motion both of the cars and trucks, especially on running at high speeds, is very great, not only in turning curves and passing over any lateral irregularities in the track, and the whole weight of the portions of the car between their points of connection with the trucks and their extreme ends acts upon the car-body like a lever pressing the truck-wheels against the tracks on one side with tremendous force, and the reaction which then takes place produces a swinging motion of the ends of the car in the opposite direction, and, as there is no guide to the trucks except the very wheels which support the weight, they are left free to run from side to side with a never-ceasing vibration, which is not only destructive to the running-gear and bodies of the cars and extremely disagreeable to the passengers, but produces the rapid grinding away of the inner sides of the rails.

Another advantage of my invention consists in the great size of which the supporting-wheels D D are allowed to be made. A large wheel made with a flange keeps the track with more certainty than a small one, as the flange laps over a so much greater length of the rail, and the extremities of the lapping portions act with a leverage upon the bearing portion directly under the center with a much greater leverage, to keep the plane of revolution parallel with the rail under all circumstances, except when the plane of revolution is at an angle of forty-five degrees or more to the rail; and, further, the large

wheel does not make such indentations in the ends of the rails as a small one, nor strike any upwardly-projecting ends with so much force.

The guide-wheels F F, besides keeping the larger supporting-wheels D D parallel with the track, are made to perform another duty by having a certain proportion of the weight of the cars transferred to them by the springs G. The weight so transferred, while it is not sufficient to make them strike with injurious force on the projecting ends of rails, nor to prevent them from passing easily over projecting inequalities of surface, may be sufficient to press down the ends of rails upon which they arrive before the large main supporting-wheel, and while the latter are depressing the rail behind, thus easing the passage of the main supporting-wheels from one rail to another.

This system of running-gear and connections is more especially designed for long lines of railway on which there will not be very frequent necessity for change of cars, but though the labor of attaching and detaching cars is greater than with the ordinary system, owing to one car having to be detached entirely from the flexible truck, it will be easy to provide at depots extra trucks to be run under and connected with the end of detached cars. Moreover, this system need only be used for the number of cars which constitutes the usual complement of a through train, and if way-cars are required for way passengers they may be of the usual kind and attached in the usual way.

In some cases it may be desirable to construct the flexible truck with but one guide-truck attached to one end of the main or supporting truck instead of with two guide-trucks, as represented.

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

1. A compound flexible car-truck composed, substantially as herein described, of a main truck and one or more flexibly-attached guide-trucks, the wheels of the main truck supporting the weight or the greater portion thereof, and the wheels of the guide-trucks or trucks serving to keep those of the main truck parallel with the track, as herein set forth.

2. Supporting the connected ends of two railway-cars upon one flexible truck having supporting-wheels and guide-wheels, substantially as herein specified.

3. The arrangement of a single supporting-axle and pair of wheels, and a vertical coupling-pin for connecting two cars, with the axis of the said pin in the same plane with the axis of the wheels and midway between the two wheels, substantially as herein described.

4. The connection of the ends of two railway-cars with each other and with one supporting-truck by means of one pin, substantially as herein set forth.

5. Suspending the ends of two connected railway-cars from one truck by means of chains, links, wire ropes, or other flexible connections attached to the cars at the extremities of the sides thereof, substantially as herein described.

6. The connection of the supporting-truck and guide truck or trucks of what I term a "flexible truck" for railway-cars by means of springs by which a portion of the weight received by the main truck is transferred to the guide truck or trucks, substantially as herein specified.

7. In combination with a truck for supporting the ends of two railway-cars, rollers *h h'*, attached to the car-bodies and receiving between them the transoms of the truck, substantially as herein described.

SPENCER B. DRIGGS.

Witnesses:
HENRY T. BROWN,
GEO. W. REED.