W. D. GOODNOW.

Car Brake.

2 Sheets—Sheet 1.

No. 44,718.

Patented Oct. 18, 1864.

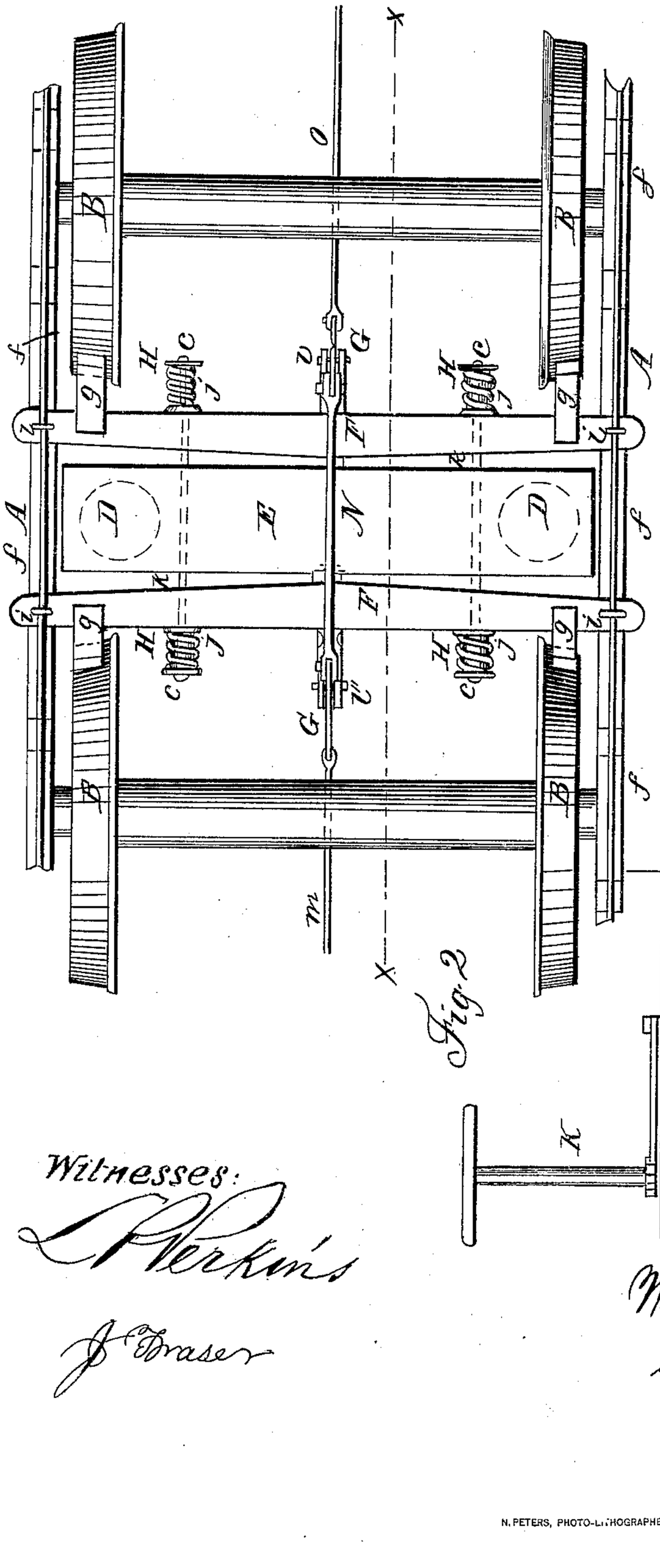

Fig. 2

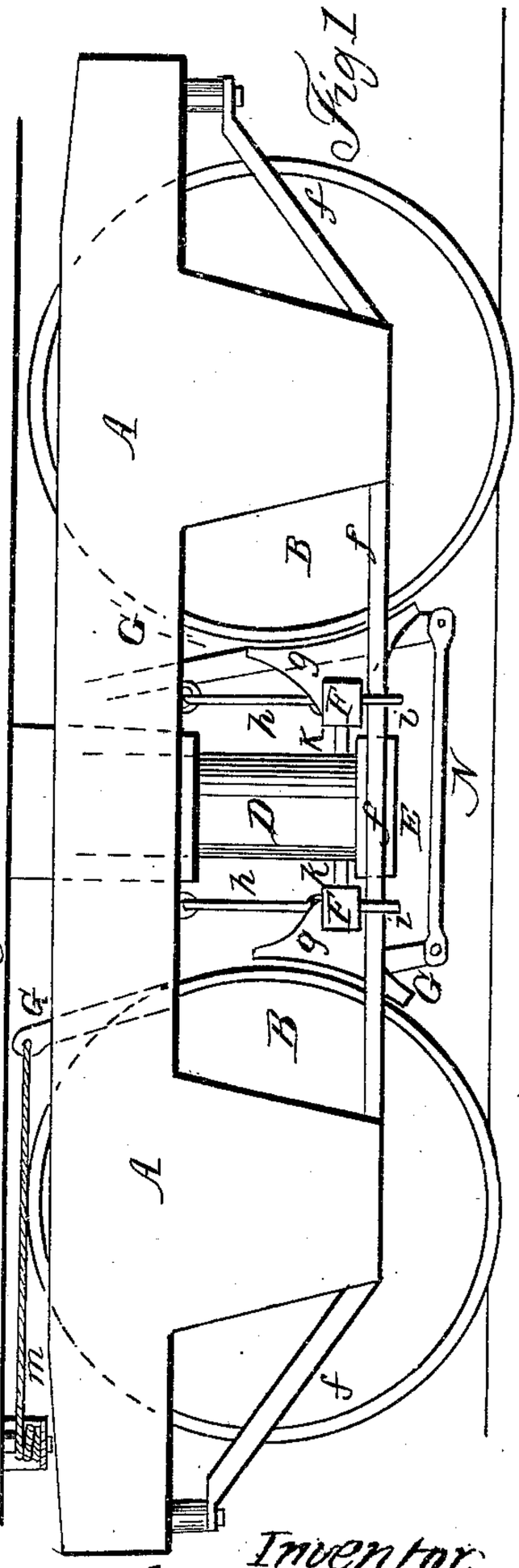

Fig. 1

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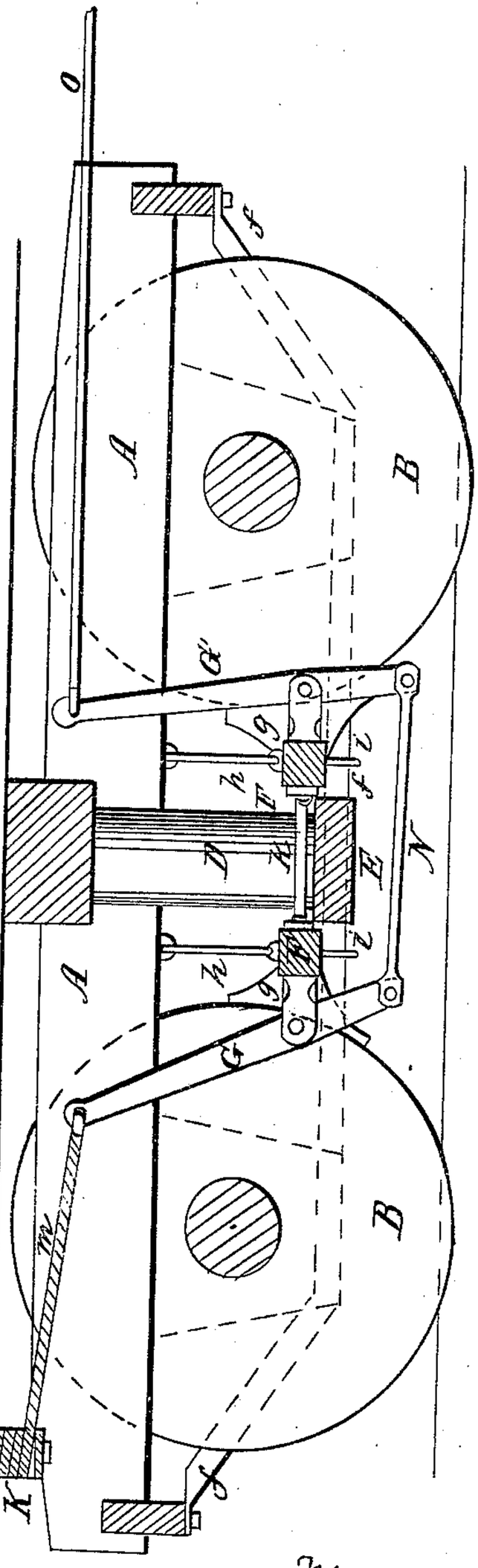
Fig. 3



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UNITED STATES PATENT OFFICE.

WILLIAM GOODNOW, OF ALBANY, NEW YORK.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **44,718**, dated October 18, 1864.

To all whom it may concern:

Be it known that I, WILLIAM D. GOODNOW, of the city and county of Albany, in the State of New York, have invented a new and useful Improvement in Railroad Car-Brakes; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of a railroad-car truck having my improved brakes attached. Fig. 2 is an inverted view of the truck, portions of the brake being shown in plan view. Fig. 3 is a vertical section of the truck and brake on the line *x x* of Fig. 2.

Like letters of reference designate corresponding parts in all of the figures.

In the ordinary method of constructing railway-car brakes they are applied to the outer side of the four wheels of the truck, thus exposing the bolts, rods, and other parts used in connecting and operating them to the liability to breakage and the loss of the screw-nuts from the excessive jarring and vibration to which they are subject, which is liable to cause some of these parts to fall under the wheels and become the means of throwing the car from the track. The weight of the car-body rests upon the middle of the truck, which is the center of its motion, and its extremities vibrate more in the ratio of their distance from the center, so that objects at their ends are subject to constant motion while the train is running, while those in the center ride comparatively steady.

It is the object of my invention to obviate this cause of accidents by a compact arrangement of the brakes in the center, between the wheels of the trucks, thereby exposing them to less danger of breaking or their parts becoming detached from the causes above mentioned; and my invention further consists in so constructing the brake-bars in combination with the jaw-braces of the trucks that in case said bars are broken they cannot fall to the track and obstruct the wheels; and in operating the two brakes conjointly by the direct endwise thrust of a short connecting-bar, by which both are made to act on the wheels simultaneously.

As represented in the drawings, A A is the frame of a four-wheeled truck, B B being the wheels, and C a portion of the car-body and platform. The weight of the car-body rests on the trucks through the medium of the springs D D, (usually made of india-rubber, as represented, or of eliptic steel,) which rest on the plank-hanger E, which is firmly attached to the truck-frame by means of iron straps. (Not shown in the drawings.) This plank usually hangs below the axis of the wheel B, in order to afford room for the action of the springs. The brake bars F F, to which the friction-rubbers *g g* are attached, are suspended from the frame above by the links *h h*, or their equivalents, and the bars are of such lengths that their ends extend beyond or outside of the jaw-braces *f f*, above which they are suspended, and a yoke or staple, *i*, extends from the under side of the end of each bar around the brace *f*, connecting it loosely therewith. Ordinarily the brakes are held away from the wheels, when not required, by curved leaf-springs connected with the truck-frame at each end; but I employ two spiral springs, H H, (shown in Fig. 2,) on the outside of each bar F, and the two bars lying parallel and near together. I extend the same bolt or rod *k k* through both, making it serve the double purpose of a guide for the springs, and a means of safety, as will hereinafter be described. There is a jam-nut, *c*, on each end of these rods, and the springs, coiled around the rods with suitable packing between, press against these nuts and the bars, there being washers *j* intervening to prevent the wear of the latter. Thus the two bars, being free to move on the rods *k k* and on their hangings, are forced toward each other by the pressure of the springs, so as to keep the brake-blocks from contact with the wheels. These springs are arranged about equidistant from the middle and ends of the brake-bars, and at the center of each a coupling-head, *l*, (shown most clearly in Fig. 3,) is firmly attached, and pivoted to these are the two levers G G′, by which the brakes are actuated, the former being connected by the chain *m* to the windlass K, which is of ordinary construction, and the latter with the rod *o*, which extends to the brake of the other truck, so that the winding up of the chain in the windlass K applies the brakes to all of the wheels of the car. The

short arm of the levers G G′ are connected by a single short bar, N, by which the motion of G is communicated by a direct endwise thrust to G′.

In the ordinary mode of constructing car-brakes the brake-bar is applied to the lower ends of the levers, which are connected by a rod in place of the coupling-head *l l*.

In order to avoid interfering with the hangings of the car-body, this connecting-rod has to be bent considerably from a straight direction, and consequently a larger bar than would otherwise be necessary must be used to give sufficient rigidity at the angles, and as the distance of the bars apart is that between the outside of the pairs of truck-wheels the weight of the rod becomes an objection, and it does not act quickly because all the slack of the joints, as well as the spring of the bent rod itself, has to be "taken up" before its force acts upon the wheels. My arrangement obviates these objections by making the axis of the brake-levers G G′ in the brake-bars, and connecting their lower ends by a short, straight, and rigid bar, N, by means of which the winding up of the chain *m* on the windlass actuates the brakes by pushing them apart, the rigid bar N being the medium of resistance between the two levers, and furnishing the fulcra from which they actuate the brakes. This mode of applying the power is exceedingly important in its effects, as it greatly simplifies the construction, as well as obviates the liability to accidents, as it is hardly possible that the bar N can be broken by the direct endwise pressure or compression to which it is subject. This bar is the only part that can, if broken loose, fall upon the track, and that contingency is rendered extremely unlikely to occur by the advantages of its situation, and by making its connections with the levers strong. Another advantage of this mode of construction is that the action of both brakes is nearly simultaneous from being direct and conveyed through so short a medium as the bar N, the situation of which is such as to render any flexibility impossible.

The parts of a brake apparatus most likely to break by use are the bars F F at the center, where they are connected with the coupling-heads *l*. These bars are also the parts most liable to fall on the track from a nut jarring off, and releasing them from connection with the truck-frame. The consequence of a portion of one of these bars, with the brake-blocks *g* attached, falling under the wheel, is to immediately throw the car from the track. My plan specially provides against these accidents, first, by elongating the bars so that their ends project outside of the jaw-brace *f*, and connecting each end therewith, so that if broken in the middle no part can fall under the wheels, but if either part falls it must be midway between the tracks, where its effects would be comparatively harmless; second, by extending the spring guide-rods rods *k k* through both bars, and above and across the plank E. This being connected with the car-body, the bars can never fall to the ground while the car and truck remain together. Thus the brake-bars are supported from either falling entire if the suspension-links give way, or in pieces should they be broken both at the ends and intermediate between the ends and the center, and, further, if the levers G G′ are broken from their connections *m o* the bars sustain them, even though they are broken from their hangings.

The described arrangement of springs not only secures the before-mentioned advantages, but reduces the cost materially by dispensing with the leaf-springs ordinarily used, which are expensive, liable to break, and require a number of bolts to each to attach them, which are all liable to be lost out of their places, while the spiral springs are not liable to break, require no bolts to fasten them, and are light and cheap.

Spiral springs have not before been used on brakes of this class, for the reason that the arrangement of the brake-bars outside of the wheels affords no convenient place to apply them.

The use of the connected guide-rods *k k* dispenses with the necessity of the safety-chains heretofore used to prevent the bars from falling on the track if they break, and are much safer, because chains are exceedingly liable to break from a sudden strain coming upon them, if the other parts give way, and are a superfluous weight if their office can be performed in a better manner by some necessary adjunct, as in the case of the guide-rods *k k*.

The arrangement of the brake-bars F F, levers G G′, and connecting or actuating bar N between the forward and back wheels is new in railway-brakes as far as I am aware, and secures the important advantages of compactness, fewness, and simplicity of the parts, and a direct pushing action between the two levers G G′.

In the old arrangement the levers are actuated by a drawing force directly the opposite of my method, from the fact that the friction-blocks have to be applied by moving them toward the center of the truck instead of from it. My arrangement insures much greater durability, and exemption from accidents in consequence of the arrangement of the working parts of the brake in the center of the truck, where it is least subject to vibration, as before described.

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

1. Extending the brake-bars F F over and beyond the jaw-braces *f f*, and connecting them thereto by means of the yokes *i i*, or their equivalents, substantially as and for the purposes fet forth.

2. In combination with the plank or hang-frame E of the car-body and the brake-bars F F, the guide and safety-rods *k k*, arranged

and operating substantially as and for the purposes set forth.

3. The combination and arrangement of the brake-bars F F, lever G G′, connecting-bar N, car-bearing E, and truck-wheels B B, constructed and operating substantially in the manner and for the purposes shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM D. GOODNOW.

Witnesses:
J. FRASER,
EDWARD P. VINING.