(No Model.)

# R. HAWES.

## CAR BRAKE.

No. 412,747. Patented Oct. 15, 1889.

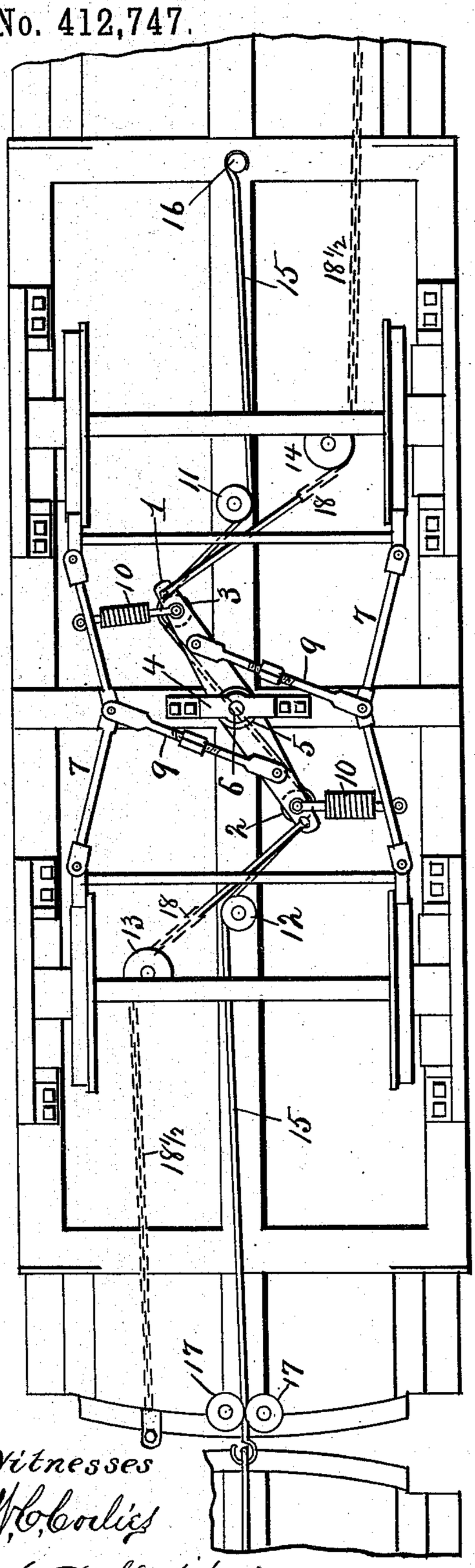


Fig 1

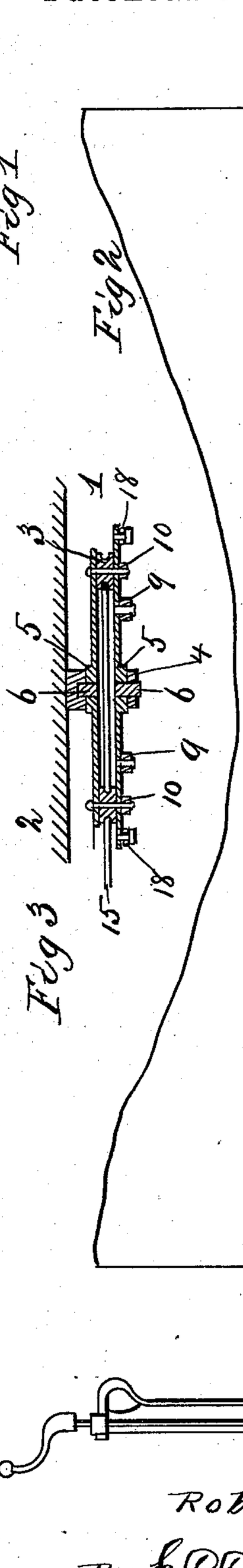


Fig 2

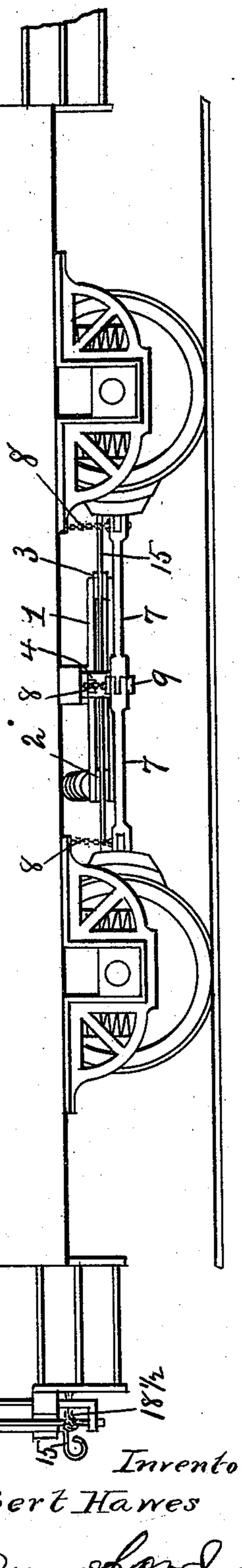


Fig 3

Witnesses
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# UNITED STATES PATENT OFFICE.

ROBERT HAWES, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN MILLER, OF SAME PLACE.

## CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 412,747, dated October 15, 1889.

Application filed August 19, 1889. Serial No. 321,294. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT HAWES, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Car-Brake, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a bottom plan view of a street-car, showing my improved car-brake attached thereto. Fig. 2 is a side elevation of the same, and Fig. 3 is a detail longitudinal section of the operative lever of the brake.

Like numerals refer to like parts in all the drawings.

My invention relates to street-car brakes generally, but especially to brakes to be used on street-cars operated by cable.

It is my object to furnish brakes that, being located under the middle of the car, will act against the wheels in opposite directions—that is, forward and backward—and it is my object, further, to so construct my mechanism that I shall reduce to the least degree the strain upon it when the brake is set.

Referring now to the drawings, 1 is the operative lever of the brake mechanism. This is made in two parts, which are secured to each other by the sheaves 2 and 3, pivoted between the said parts. The lever is pivoted at its center in the bracket 4, which is made double or having a slot, so the lever may pass through it. Bosses 5 5 are secured to the upper and lower parts of the lever at its center, and have rigidly secured in them the pivots 6 6, which pass into sockets prepared for them in the upper and lower parts of the bracket. The bracket is secured to the cross-beam of the car by any suitable means, so that its center shall coincide with the center of the bottom of the car. The brake-shoes are pivoted or hinged to the ends of the toggle-joints 7 7. The brake-bars are suspended to the bottom of the car between the inner wheels by means of the chains 8, and they are made of such length that when drawn out straight they will press the brake-shoes tightly against the wheels. Rigid connecting-links 9 9, furnished with turn-buckles, are pivoted at one end to the junctions of the toggle-joints and at the other to the operative lever. Coiled springs 10 10 are secured to the ends of the said lever and to the sections of the toggle-joints. The sheaves 11 and 12 are pivoted on the bottom frame-work of the car in line with the center of the bracket 4 and outside of the brake-shoe bars. Sheaves 13 and 14 are pivoted on the bottom frame-work of the car outside the brake-shoe bars and on opposite sides of both the central transverse and central longitudinal lines of the car. The wire rope 15 is fastened in any suitable manner to the bottom of the car, near an end of the same, and is then passed about sheaves 11 and 3, through lever 1, about sheaves 2 and 12, between sheaves 17 17, (which are designed only to hold the rope up,) and is carried forward and secured to the rope or chain which extends to the drum on the grip-car, the same being of well-known construction, the handle of which is placed within reach of the driver of the grip-car. Now, if this handle be turned and the rope be drawn taut, the several above pivoted parts affected by the rope 15 will each turn on its pivot till the actuating-lever 1 is in line with the sheaves 11 and 12, when the toggle-joints will have been drawn out into straight lines, and will thus have forced the brake-shoes tightly against the wheels, where they will stay till the brake-handle is reversed. It is obvious, the lever 1 and the toggle-joints having been thus made parallel to each other and the toggle-joints acting in straight lines and the links being parallel to each other, that there will be very little, if any, strain on any of these parts; that nearly all, or all, the strain will be concentrated upon the rope 15. Hence loss by breakage will be reduced to a minimum.

It is intended that this brake shall be operated chiefly by the driver of the grip-car; but that it may be operated also by the conductors of the trailers the sheaves 13 and 14 and the rods and chains 18 and 18½ are provided. These ropes are secured, respectively, to the ends and opposite sides of lever 1 and passed about the said sheaves and then fastened to the brake-handle rods. The operation is too obvious to require explanation. The spring 10, secured to one end of lever 1 and to a sec-

tion of one of the toggle-joints, is designed to draw the brakes out of contact with the wheels when the brake-handle is released.

The rear end of the rope 15 may be made with some suitable device for securing it at pleasure either to the bottom of the car or to the front end of the corresponding rope in the next rear car, so the brakes of several trailers may be set at one time by the driver of the grip-car. I do not limit the use of my brake to street-cars alone. It is obvious that it may be used on other cars, and I want to be understood as intending such use.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A car-brake consisting of the combination of a duplicate lever pivoted beneath the center of a car, two sheaves pivoted between the parts of said lever, two toggle-joints pivoted each to two brake-shoes or to the opposite brake-bars and suspended between adjacent car-wheels, connecting-links pivoted to the junctions of the toggle-joints and to said lever, and a rope or chain passing through said lever to brake-handle rod, substantially as and for the purposes specified.

2. A car-brake composed, in combination, of a duplicate lever pivoted beneath the middle portion of a street-car, two sheaves pivoted between the parts of said lever, two toggle-joints pivoted each to two brake shoes or bars and suspended between adjacent car-wheels, rigid connecting-links pivoted to junctions of toggle-joints and to said levers on opposite sides of its center, a rope or chain secured at one end to bottom of car or to corresponding rope under next rear car and passed through said lever to brake-handle rod, the retracting-spring 10, and the sheaves 11 and 12, substantially as and for the purposes specified.

3. In a car-brake mechanism, the duplicate lever 1, the toggle-joints 7 7, pivoted to brake shoes or bars, the connecting-links 9 9, sheave-rod 18, secured to end of lever 1, and chain $18\frac{1}{2}$, secured to brake-handle staff, as and for the purpose stated.

4. In a street-car-brake mechanism, the combination of the duplicate lever 1, the bracket 4, having sockets in its center and formed to allow said lever to pass through it, the bosses 5 5, secured to the center of the parts of said lever, and the pivots 6 6, secured in said bosses so as to pass into said sockets, as and for the purpose stated.

ROBERT HAWES.

Witnesses:
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