

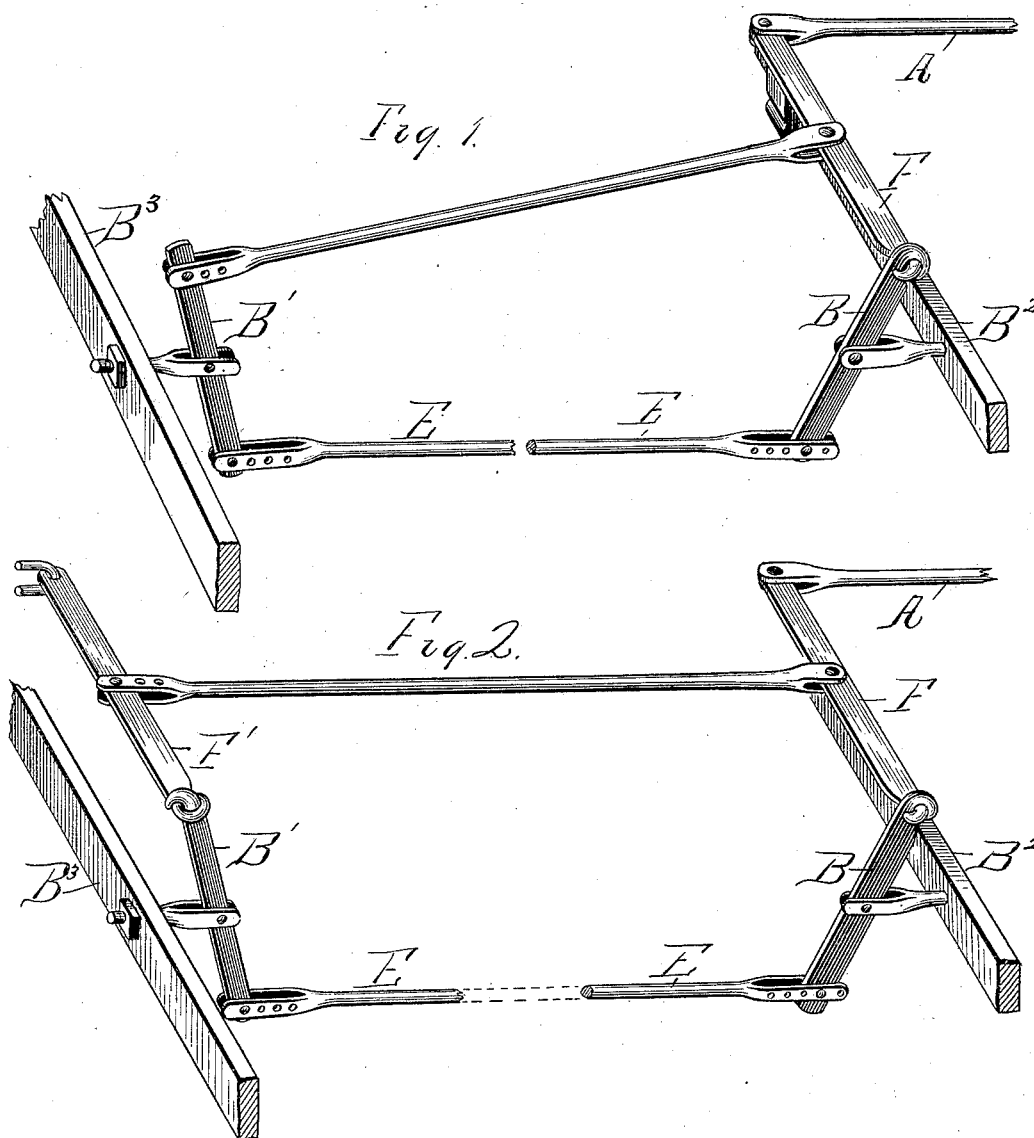
(No Model.)

3 Sheets—Sheet 1.

H. HACKNEY.  
CAR BRAKE.

No. 419,665.

Patented Jan. 21, 1890.



Witnesses  
Harry Bitner  
W. W. Hill

Inventor  
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By his attys  
Hill & Dixon

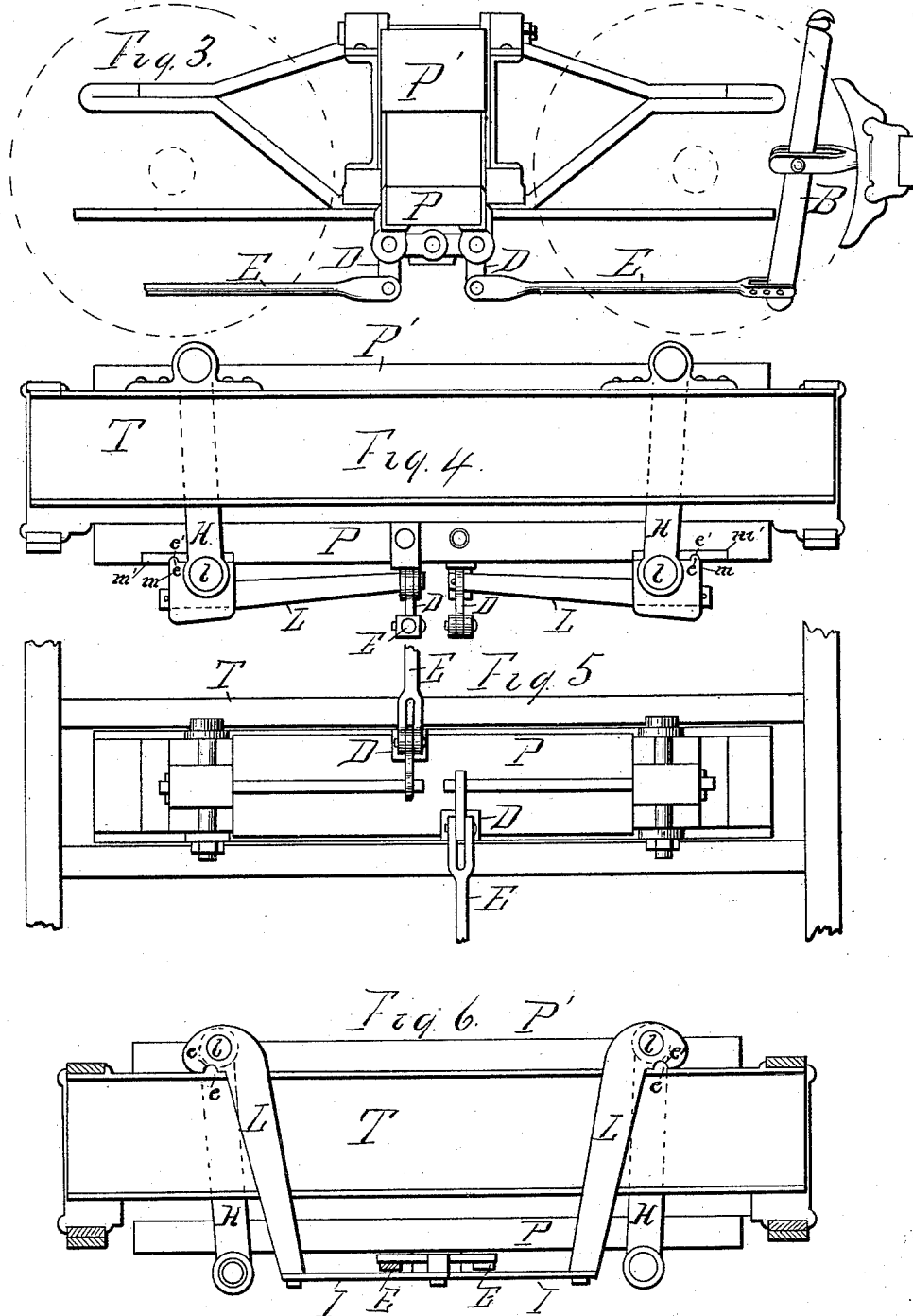
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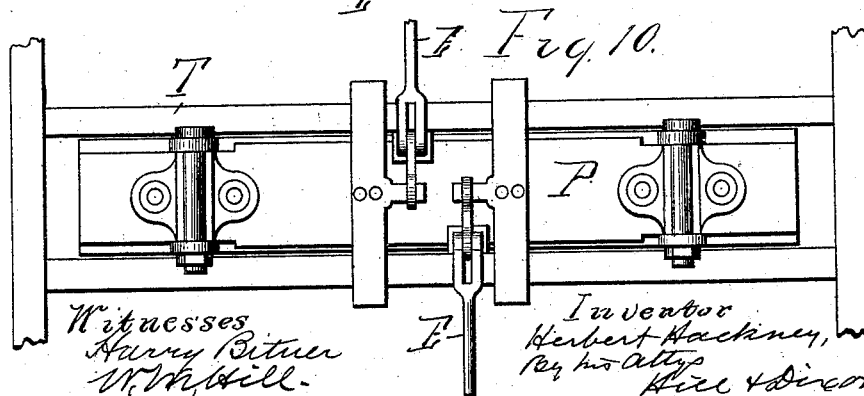
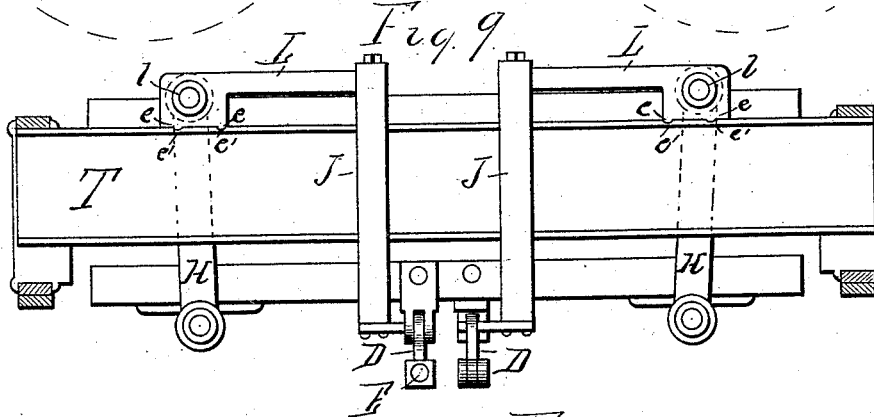
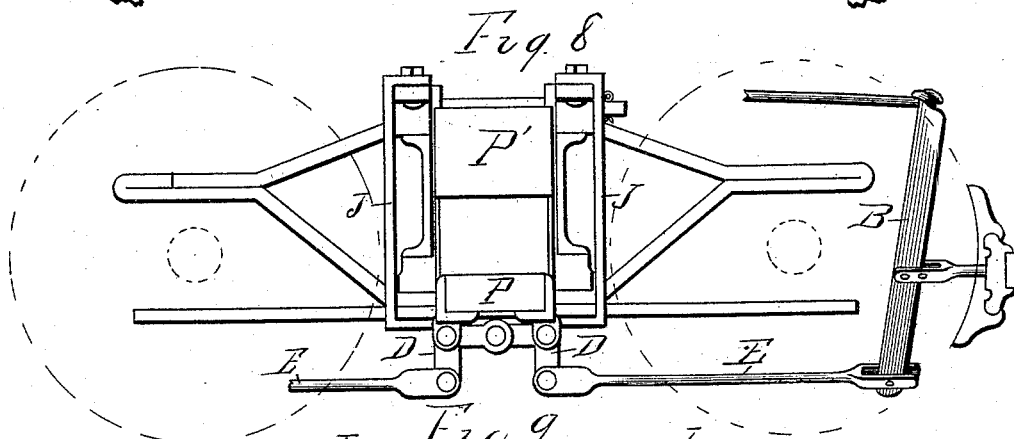
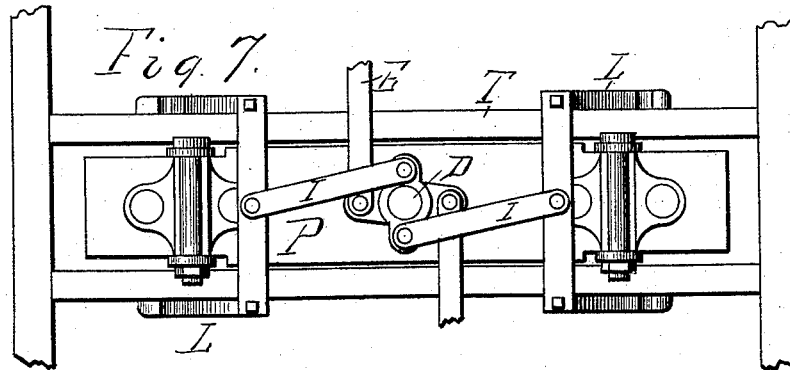
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# UNITED STATES PATENT OFFICE.

HERBERT HACKNEY, OF TOPEKA, KANSAS.

## CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 419,665, dated January 21, 1890.

Application filed May 4, 1889. Serial No. 309,568. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT HACKNEY, a citizen of the United States of America, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Car-Brakes, of which the following is a specification.

Referring to the accompanying drawings, wherein similar reference-letters indicate the same parts, Figures 1 and 2 illustrate in perspective two of the possible arrangements of the brake levers and rods. Figs. 3, 4, and 5 are respectively side, front, and bottom views illustrating one form in which my invention may be applied. Figs. 6 and 7 are respectively front and bottom views showing another form of application; and Figs. 8, 9, and 10 are side, front, and bottom views showing a third modification.

This invention relates to that class of car-brakes in which the limit of maximum brake-pressure is automatically varied and adjusted by the weight of the load. Its object is to improve the means employed for effecting the automatic regulation aforesaid; and it consists, first, in an improved combination of mechanical elements therefor, and, secondly, in so constructing and applying the lifting-levers that they will also serve as safety-hangers for the spring-planks.

The invention is applicable to any form of car-truck, whether constructed on the "swinging bolster" or "rigid bolster" plan, by merely formal adaptations with the skill of any skilled mechanic, and therefore not necessary to be herein described.

The essential elements of my invention are, first, a pair of strong lifting-levers supported on or from the truck by any suitable means, so as to lift upward against the lower spring-plank at two points between the middle and the ends thereof; second, a system of draft-rods or push-bars connected to the brake-levers, brake-beams, or brake-shoes on the one hand and to said lifting-levers on the other hand, whereby the main brake-rod, after first applying the brake-shoes to the car-wheels, transmits the residue of its force to the lifting-levers to lift against the weight of the car and its load, and, thirdly, a bell-crank or angle-lever connection between said system of draft-rods or push-bars and said two lifting-levers for articulating them positively and strongly to each other, and at the

same time changing the direction of the force to adapt it to the proper operation of the lifting-levers.

In my second improvement above mentioned the main element consists in a hanger or hangers adapted to apply the power of the lifting-levers to the lower spring-plank and extending under said plank, so as to receive and support it in case of any accidental failure of the ordinary hangers or other supports employed.

In the accompanying drawings, which illustrate the swinging bolster form of truck, T represents the frame of the truck, P the lower spring-plank suspended from the truck-frame by the usual hangers H H, and P' the upper spring-plank resting upon the car-springs (not shown) in the usual manner.

L L are the lifting-levers, fulcrumed at l and operated by a bell-crank lever or levers D to lift against the lower spring-plank, and thereby against the weight of that end of the car (and its load) which is supported by the truck in question. The bell-crank levers D are operated by rods or bars E, connected to the brake-levers B B' in such a manner that in the act of applying the brakes the brake-levers will first set the brake-shoes against the wheels and then transmit the residue of their force through the rods or bars E and angle-levers D to the lifting-levers. So long as the latter do not yield the entire brake force applied will act on the brake-shoes to force them against the wheels; but when the lifting-levers yield and raise the car any additional increment of brake force will not act upon the wheels, but will be expended in lifting the weight of the car and its load. Hence the heavier the load the greater will be the brake force which can be applied to the wheels; or, in other words, the maximum limit of brake-pressure will vary directly with the weight carried by the car-wheels through the automatic operation of the weight itself, which acts as a yielding abutment to hold the brakes up to their work. There being many ways in which the brake-levers and connecting rods or bars can be arranged to properly actuate the two operating rods or bars E, I have deemed it necessary to show only two of these possible arrangements by way of illustration.

A, Fig. 1, is the main brake-rod by which power is applied from the hand-brake spin-

dle or lever or the air-brake piston or diaphragm to operate the brakes. By connecting this rod to the brake-lever B by an intermediate lever F and connecting the lever F to the other brake-lever B' (or, as shown in Fig 2, to a lever F', arranged to operate the other brake-lever B') the two brake-beams B<sup>2</sup> B<sup>3</sup> will be simultaneously forced in opposite directions against the two car-wheels at either side of the truck, and, fulcruming against the wheels, the brake-levers B B' will force the rods E E in opposite directions and suitably operate the bell-cranks and lifting-levers when the force becomes sufficient for that purpose.

Figs. 3, 4, and 5 exhibit a form of the apparatus without the safety-hangers. In this case the simplest and most inexpensive construction is to fulcrum the lifting-levers to the lower end of the ordinary hangers H and connect their long arm directly to the bell-cranks at a point or points nearly under the middle of the truck, as shown, leaving their short arm bearing up at *m* against the under side of the spring-plank, which should be re-enforced with a metal plate *m'* at the points of contact.

Figs. 6 and 7 exhibit the safety-hangers, which in this instance are the lifting-levers themselves, constructed to extend down on both sides of the truck-beam and across under the lower spring-plank. With this construction the best way is to articulate the lifting-levers to the upper ends of the hangers H and turn their ends outward, so as to bear upon the upper surface of the truck-beam and thereby obtain a bearing from which to lift upon the hangers, as shown.

The two bell-cranks represented in Figs. 3, 4, and 5 are here combined in one equivalent turning plate or block connected to the lifting-levers by draft-bars I I and directly to the rods or bars E.

Figs. 8, 9, and 10 exhibit safety-hangers J, constructed separate from the lifting-levers. In this instance the lifting-levers are arranged above the truck-beam, fulcrumed thereon, and articulated to the hangers H, so as to lift the latter, and straps J extend across the long arms of said levers, thence down the sides of the truck-beam, and across under the lower spring-plank, where they are connected to the bell-cranks, as shown.

The different figures (3 to 10, inclusive) illustrate differences of application and practical adaptation that will clearly enable the principle of my invention to be distinguished from mere matters of form, and will also indicate to mechanics how the apparatus may be modified to suit special requirements in different cases. For example, where there is not sufficient room below the lower spring-plank to arrange the lifting-levers in the manner shown in Figs. 3, 4, and 5 they may be arranged above the truck-beam, as seen in Figs. 8, 9, and 10, or if there is not sufficient available space there, then at the sides of said beam, as represented in Figs. 6 and 7.

To prevent the spring-plank from swinging independently of the lifting-levers, and thus disturbing the proper relation of the parts, a projection *e* and recess *e'*, interlocking with each other, may be formed on the levers and the part against which they bear, as represented in different forms in several of the drawings.

In an apparatus for the purpose herein set forth, in which the lifting-levers are liable to be called into action to support the weight of the car while the train is running and violently jolting, great strength of the mechanical parts and their connections is an absolute necessity, and at the same time they should be capable of an accurate adjustment for proper working, and should keep that adjustment unimpaired for long periods of time and under great wear and strain, while simplicity of construction, convenience of application to different forms of truck, and economy of manufacture are always important considerations. My improved combination of parts has been specially devised with reference to all these important requirements. In its simplest form and with a proper arrangement of brake-leverage it practically requires but three mechanical elements, viz: the operating rods or bars E, the lifting-levers, and the bell-crank connections. These can all be made of any required strength and fitted to work accurately, and, as they are simply articulated to each other, the joints can be made of any required strength and durability, so as to last as long as any other part of the brake system or the truck.

In applying the invention I arrange the apparatus to lift against the lower spring-plank, in order to lift the car-spring with the cars, or, in other words, to bring the action of the springs between the lifting devices and the weight to be lifted, and thus render the effective resistance to the action of said devices uniform so long as the weight is unchanged.

Having thus described my improvements, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the car-truck, the lifting-levers L L, bell-cranks D D, rods or bars E E, and means for applying power from the brake-rod A through the brake-levers B B' to the respective lifting-levers, substantially as described, whereby the application of such power sets the brakes against the wheels and also tends to lift the lower spring-plank and the weight of the car carried thereby during the act of applying the brakes.

2. The combination of the car-truck, lifting-levers L, bell-cranks D, and rods or bars E with the projections and recesses *e e'*, for holding the parts in their proper relative positions, substantially as described.

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Witnesses:

HARRY BITNER,  
L. HILL.