(No Model.)

J. W. RICE.

RAILWAY CAR BRAKE.

No. 345,320. Patented July 13, 1886.

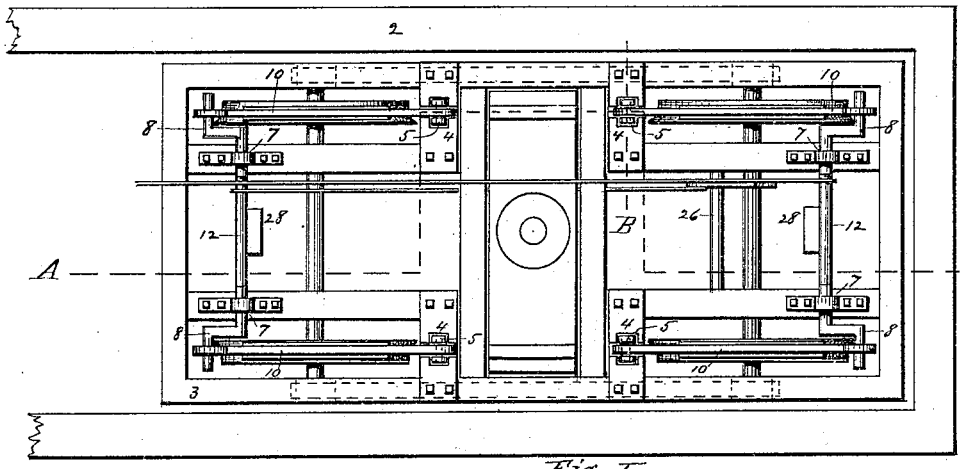


Fig. I.

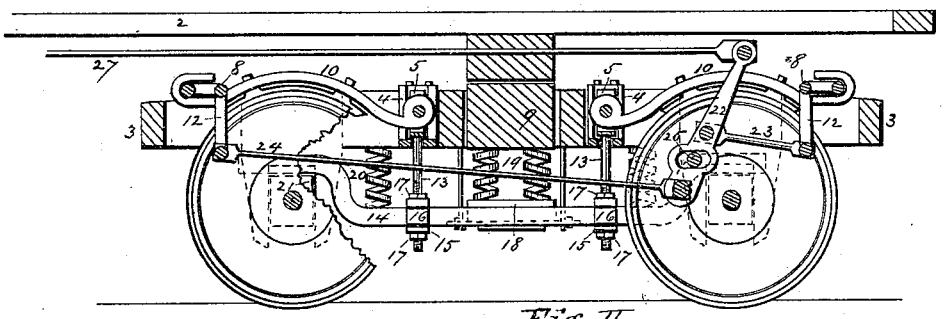


Fig. II.

Fig. III.

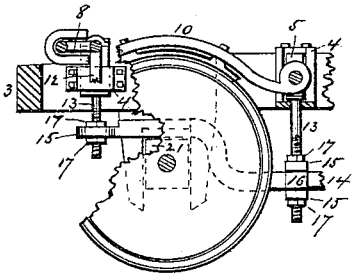
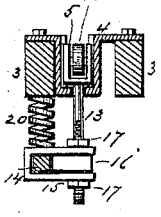


Fig. V.



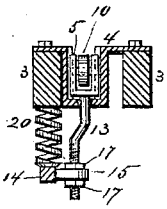


Fig. VI.

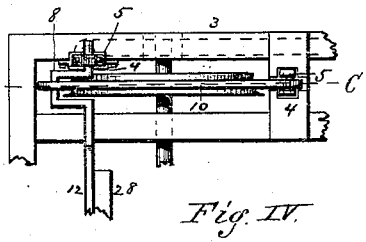


Fig. IV.

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JOHN W. RICE, OF SPRINGFIELD, MASSACHUSETTS.

RAILWAY-CAR BRAKE.

SPECIFICATION forming part of Letters Patent No. 345,320, dated July 13, 1886.

Application filed January 15, 1886. Serial No. 188,622. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. RICE, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Railway-Car Brakes, of which the following is a specification and description.

My invention relates to a brake mechanism for retarding the movement of a railway-car or a train of cars; and its object is, first, to cause the brake-bar and its shoe to partially or wholly retain the same relative position with reference to the car-wheels, instead of wholly partaking of all the vertical movements of the truck-frame in applying the brake to the top of the wheel at the tread; and, second, to cause the brakes to be automatically released from pressure against the wheels without the use of springs whenever the mechanism used to apply them is let off or released.

To this end my invention consists, first, of a brake-bar extending lengthwise the truck above the wheel and having one end adapted to be moved freely in a vertical direction by a rock-shaft, and supported either at one or both its ends by the equalizing-bar, which extends between and is supported by the axles; and, second, my invention consists of a weighted operating rock-shaft, whose own weight, when hung in its bearings, will always cause it to remain in the same relative position with the brake-bar when not in use.

I accomplish these objects by the means substantially as hereinafter described and illustrated in the accompanying drawings, in which—

Figure I is a plan view of one of the trucks of a railway-car having my invention applied. Fig. II is a vertical longitudinal section of the same at line A of Fig. I with one of the wheels broken away to show the equalizing-bar and its bearing upon the journal-box. Fig. III is a transverse vertical section through the equalizing-bar and its connection with the brake-bar at line B of Fig. I. Fig. IV is a plan view of a portion of the truck and frame, showing the operating rock-shaft adapted to be supported upon the equalizing-bar. Fig. V is a vertical section of the same at line C and with a portion of the wheel broken away to show the movable block adapted for the bearing of one end of the operating rock-shaft and which is connected with the equalizing-bar; and Fig. VI is a transverse vertical section of a guide-box and block adapted for the bearing of the hinged end of the brake-bar and made similar to that shown in Fig. III, but with its threaded stem bent and extending down through an eye made upon or secured to the equalizing-bar.

In the drawings, 3 represents one of the truck-frames of a railway-car. 9 is the bolster upon which the car rests, and 18 is the bed which is suspended from or is attached to the truck-frame, with the springs 19 placed between the bolster and bed.

14 represents the equalizing-bar, which extends from one axle to the next, on each side of the truck-frame, with its ends bearing upon the journal-boxes of the adjacent axles, with the springs 20 placed between the equalizing-bar and the truck-frame on each side. This above-described portion of a railway-car I do not claim, as it is now well known and in use; but it is herein described and referred to for the purpose of explaining and illustrating the vertical movement of the truck-frame, independently of the car-wheels, whenever the car is in rapid motion, and of noting the advantages of supporting the brake-bar and its shoe upon this equalizing-bar instead of upon the truck-frame, as now ordinarily practiced.

It will be seen that, as above described, and illustrated in the drawings, the weight of the car rests upon the truck-frame through the interposed bolster 9, springs 19, and bed 18, attached to or suspended from the truck-frame, and the latter, together with the superimposed weight of the car, rests upon the springs 20, placed upon the equalizing-bars 14 and beneath the truck-frame. This construction operates in a measure to equalize the motion of the truck-frame; but when the car is in rapid motion, in swaying from side to side its weight is constantly changing from one side of the truck-frame to the other, which compresses the springs 20 more upon that side temporarily sustaining the greatest weight. For example, when the car is in rapid motion around a curve in the track, the car is thrown outward toward

the outer rail by the rapid motion, and its weight rests more upon that side of the truck-frame. The springs 20 upon that side are thereby compressed more than those upon the opposite side, and the outer side of the truck-frame is more depressed than the other with reference to its relative position with the tops of the car-wheels. The opposite side of the truck-frame being also relieved of this weight of the car which is thrown outward, the springs upon that side correspondingly open, and that side of the truck-frame rises, one side of the truck-frame being considerably higher and the other side considerably lower than its normal position from this swaying movement of the car. If the brake-bars are hung to the truck-frame, whether the brakes are applied to the tread of the wheel at the top or in front or rear of the axle, it is evident that under these circumstances the brake-shoe does not always properly fit the wheel for its whole length, and the brakes are not economically applied nor with uniform pressure against the wheel. It is also evident that however much either side of the truck-frame may be depressed below the other, or whatever may be its position out of its normal one, the equalizing-bar 14 always maintains its relative position with the wheels, and does not change its position in that respect, because its ends rest upon the journal-boxes, and as a car moves around a curve as the wheels on the outside rise in passing up onto the elevated outer rail, the bar 14 on that side rises also to exactly the same degree, these bars operating precisely the same as if they were made rigid with the axles and independent of the truck-frame. To obviate this vertical movement of the brake bar and shoe caused by the truck-frame when attached thereto, I adapt the brake-bars to be supported by the equalizing-bars 14, and this may be done either directly by hinging the brake-bar to the equalizing-bar itself or by hinging it to an upright attached to the equalizing-bar, according to what part of the wheel the brake is to be applied.

In the drawings, 10 represents the brake-bar, supplied with a shoe and arranged to be applied to the tread of the wheel at the top, in which case I attach a socket or box, 4, to the truck-frame near each wheel, in which box is a block, 5, adapted to be moved vertically within the box either up or down. This block has a rod or stem, 13, extending downward from its lower side and through holes in a strap, 15, which extends around and fits properly the equalizing-bar 14, and a screw-thread is made upon the lower part of the stem for a part of its length, so that a check-nut, 17, placed on the stem above the strap and one below it may be turned against the strap 15, both above and below, so that the block may be adjusted at any time to any desired height and secured by turning the nuts firmly against the strap. In order to make the strap solid and firm, I fit a block or piece, 16, into the space between its ends, so that when the nuts are turned firmly against the strap there may be no loose vertical movement of the latter. The brake-bar 10, adapted to be applied against the tread of the wheel at the top, is hinged at one end in an opening or vertical slot in the block 5, so that the brake-bar 10 may swing freely in a vertical direction, and the other end of the brake-bar is adapted to engage with an eccentric or crank pin, 8, made on the end of an operating rock-shaft, 12, which has its bearings in the truck-frame in the construction shown in Figs. I and II. The middle portion of this operating rock-shaft, which extends between its bearings on the truck-frame, is bent downward to form an arm, as shown in Figs. I and II, to which part of said shaft, at one end of the truck, is attached the rod 23, connected with the equalizing-lever 22, hung in its elongated opening 25 upon the shaft 26, and a rod, 24, is attached at one end to the lower end of this equalizing-lever 22, and at the other end to the downward-extending middle portion of the operating rock-shaft at the opposite end of the truck. The bent middle portion of the operating rock-shaft is weighted or provided with a weight, 28, which may be attached thereto by bolts or in any convenient way; or it may be made integral with the shaft and of sufficient size to cause the shaft to remain in a position to hold the brake-bar and its shoe away from the wheel when not in use. As thus arranged, when the car is in rapid motion, as one side or the other of the truck-frame is depressed by the swaying movement of the car from side to side, the block 5, supported upon the equalizing-bar 14, is free to move up or down in the box 4, and the hinged end of the brake-bar and its shoe always remain in the same position with reference to the wheel instead of moving up and down with the truck-frame.

The arrangement shown in Figs. I, II, and III is especially adapted for applying my invention to cars already in use, in which case the free tilting end of the brake-bar only has the same vertical movement as the truck-frame, caused by the swaying movement of the car, inasmuch as the operating rock-shaft 12 has its bearings, in Figs. I, II, and III, in the truck-frame. A large portion of this vertical movement of the brake-bar is obviated, however, by this arrangement shown in Figs. I, II, and III.

Figs. IV, V, and VI illustrate an arrangement by which the entire brake-bar, with its shoe, may be caused to remain wholly in the same relative position with the wheel without any vertical movement whatever, which arrangement is more applicable to the manufacture of new cars, or adapted for the attachment of the invention to those cars already in use whose construction will admit of it by applying the same device to the free or vibrating end of the brake-bar, in which case the equalizing-bar may be extended a little at its ends and an eye, 15, made upon or secured to the end of said bar, as shown in Fig. V, and a box, 4, secured to

the truck-frame above the eye, and a block, 5, adapted to slide vertically in the box, and provided with the stem 13, extending downward through the eye, so that the block 5 may be adjusted to the desired height in the box, and there secured by a check-nut turned upon the lower threaded end of the stem 13, against the eye, above and below it. The operating rock-shaft, whose crank in this case is made double or a full crank, as shown clearly at 8 in Fig. IV, has its bearing in the top of this block 5, as shown in Figs. IV and V, so that the crank and shaft which operates the brake-bar in applying the brake, is also supported by the equalizing-bar 14. As thus constructed, the whole brake mechanism is entirely and wholly independent of the truck-frame for support, and the vertical movements and variations of position caused by the side movements of the car are not transmitted to the brake, and as a result the brake is applied economically and with uniform pressure against the wheels and with no unpleasant jar to the car.

Instead of using the strap 15, extending around three sides of the equalizing-bar 14, as shown in Figs. II, III, and V, and through which the stem 13 extends, and to which it is secured by the check-nuts, an eye, 15, (shown in Fig. VI,) may be made upon or secured to the equalizing-bar and extend sufficiently therefrom, and the stem 13, extending down from the block 5, may be bent, as shown in Fig. VI, so as to extend quite near the bar 14, without departing from the invention in the least.

I do not wish to be understood as being limited in this invention to this particular construction or use of the block 5 with its stem 13 in connecting the brake-bar with the equalizing-bar 14, because these blocks would not always necessarily be required at both ends of the brake-bar in connecting the latter with the equalizing-bar. For example, if, instead of applying the brake to the tread at the top of the car-wheel, it were applied more in a vertical position, either in front or rear of the axle at the tread, one end of the brake-bar might easily be hinged directly to the equalizing-bar 14, and, extending upward, its free or vibrating end be operated by the rock-shaft having its bearing in the block 5 with its stem 13, as hereinbefore described, in which case the brake-bar would be entirely independent of the truck-frame, though only one block would be used for each brake-bar. The particular construction as to details would be according to the particular location of the brake-bar with reference to the wheels and the details of the construction of the car and its truck.

In applying the brakes to a car the brake-rod 27 draws over the upper end of the equalizing-lever 22, which draws upon the short rod 23, and tilts the operating rock-shaft at one end of the truck, and the lower end of the equalizing-lever 22 in moving in the opposite direction from its upper end draws upon the rod 24 and tilts the rock-shaft at the other end of the truck. The crank at the ends of these rock-shafts, engaging with the swinging ends of the brake-bars 10, move them toward and against the car-wheels to stop the car. When the applying power is released, the weight of the lower bent portion of the rock-shaft restores the latter to its former position and moves the brake-bars 10 away from the wheels, so that all springs are dispensed with in the use of this invention.

Having thus described my invention, what I claim as new is—

1. In an improved railway-car brake, an equalizing-bar extending between and supported by the axles of the truck, in combination with and supporting a brake-bar hinged at one end and supported by said equalizing-bar and extending lengthwise the truck above the wheel, and whose opposite end is adapted to be moved downward in a vertical direction in applying the brake to the tread of the wheel at the top and upward and away from the wheel in releasing the brake therefrom, substantially as described.

2. In an improved railway-car brake, the combination of an equalizing-bar extending between and supported by the axles of the truck, a brake-bar hinged at one end and supported by said equalizing-bar and extending lengthwise the truck above the wheel, and whose opposite end is adapted to be moved freely in a vertical direction, and an operating rock-shaft provided with a crank-pin or eccentric adapted to engage with the free swinging end of said brake-bar to move the latter up and down in applying the brake to the car-wheel at the top and releasing it therefrom, substantially as described.

3. The combination, in a railway-car brake, of a brake-bar hinged at one end, and an operating rock-shaft provided with a crank-pin or eccentric adapted to engage with the free swinging end of said brake-bar, and with the middle portion of said shaft turned downward and weighted so that the brake-rod attached to this lower portion of the shaft is adapted to rock the latter in one direction in applying the brake, and the said shaft is caused to rock in the other direction to release the brake by the weight of said lower portion automatically, substantially as described.

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