(No Model.) 2 Sheets—Sheet 1.

J. D. METS.

AUTOMATIC CAR BRAKE.

No. 441,015. Patented Nov. 18, 1890.

Fig 1.

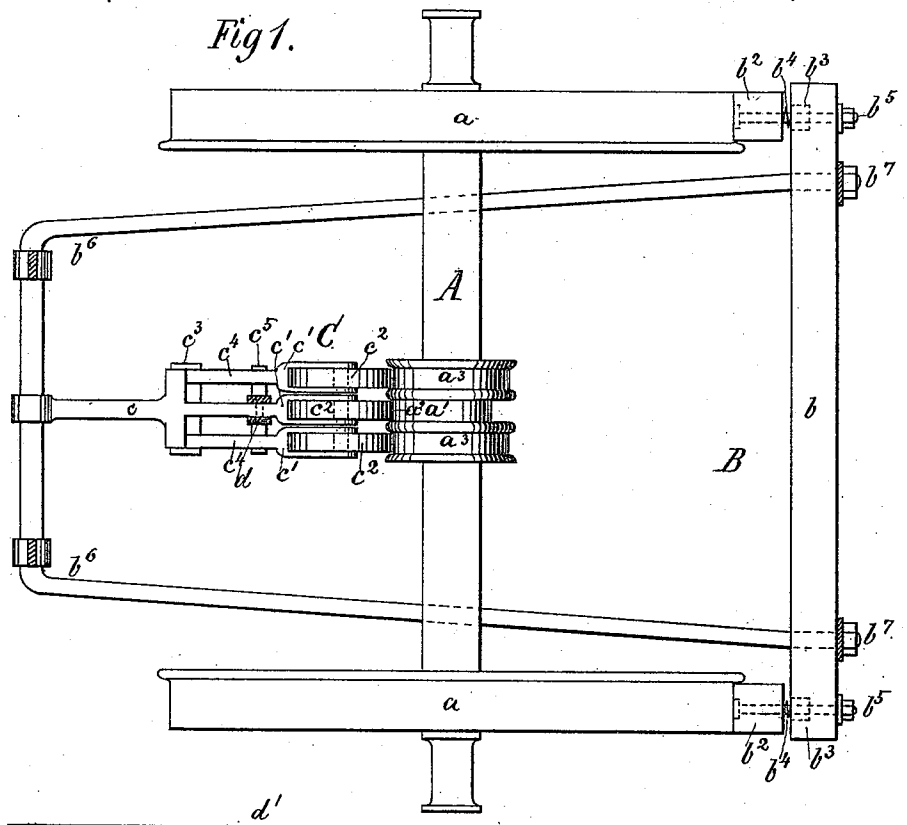
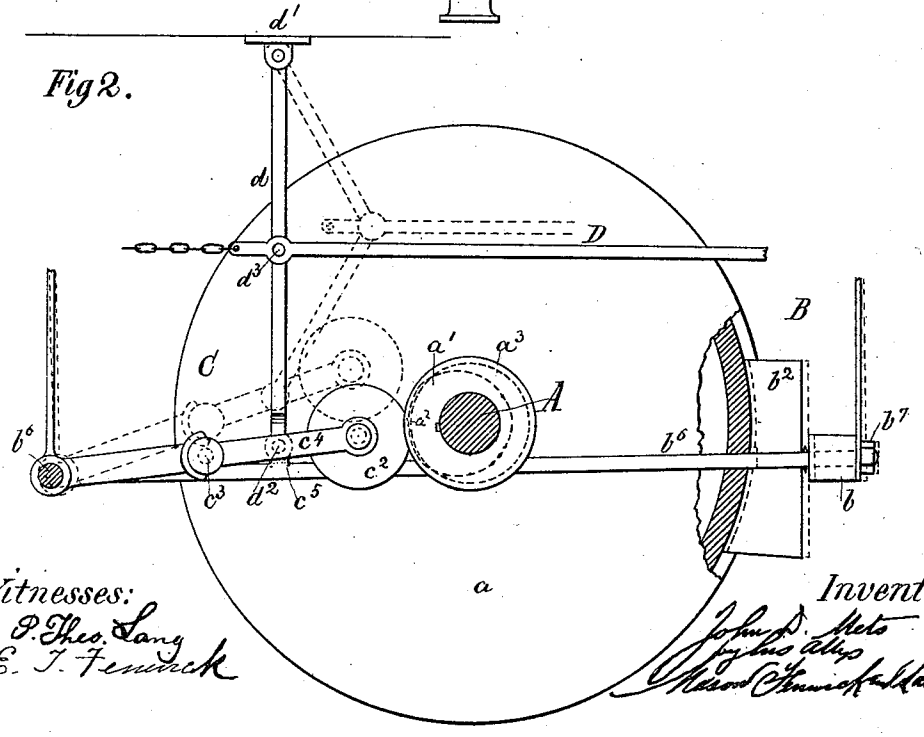


Fig 2.



Witnesses:
J. P. Thos. Lang
E. J. Fennick

Inventor:
John D. Mets
by his attys
Mason Fennick & Lawrence

THE NORRIS-PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

J. D. METS.

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Fig 3.

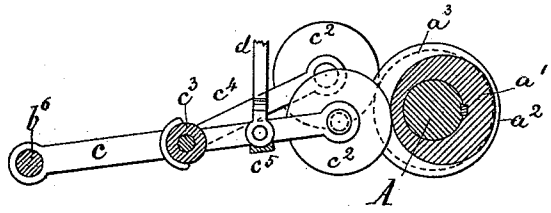


Fig 4.

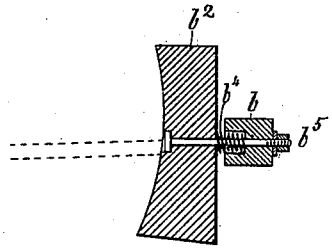


Fig 5.

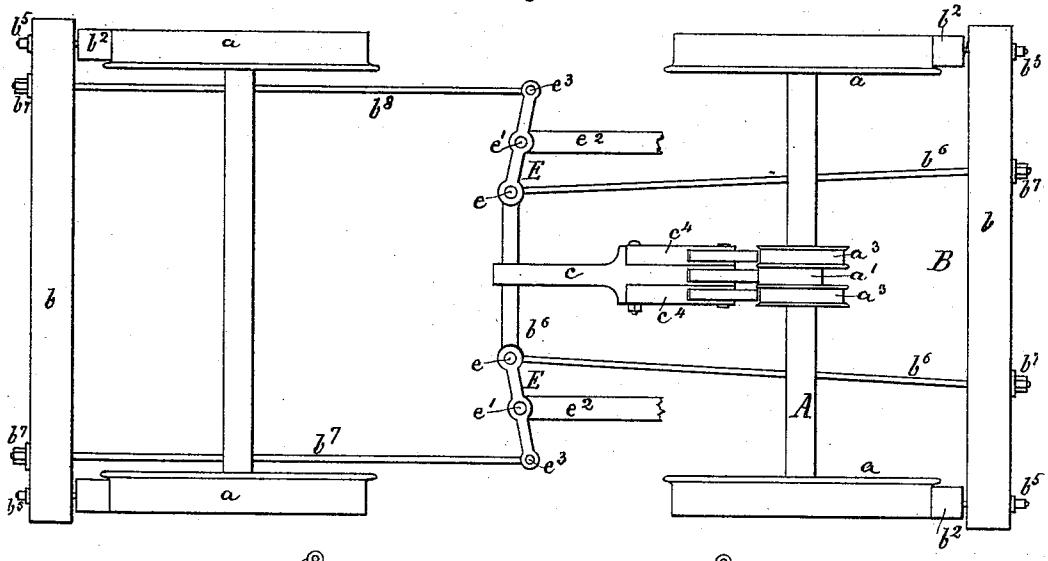
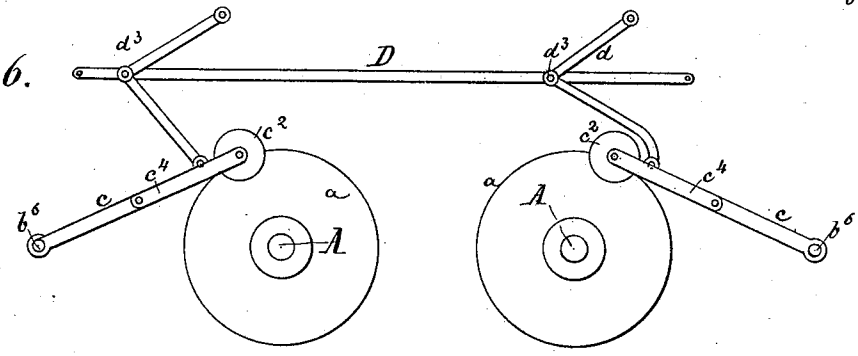


Fig 6.



Witnesses:
J. P. Theo. Lang
E. J. Fenwick

Inventor:
John D. Mets
by his attys
Mason, Fenwick and Lawrence

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN D. METS, OF DUBUQUE, IOWA.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 441,015, dated November 18, 1890.

Application filed June 2, 1890. Serial No. 354,004. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. METS, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Automatic Car or Train Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to automatic car and train brakes; and it consists in certain novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and specifically claimed, whereby a car or train brake of very simple and durable mechanism is produced, and which can be quickly and effectively operated by the engineer for either putting on or off the brakes.

In the accompanying drawings, Figure 1 is a top view of my invention as applied to a car. Fig. 2 is a vertical longitudinal section through the brake-bar and its operating-bail and the car-wheel axle, taken in front of the central or power mechanism. Fig. 3 is a view, partly in elevation and partly in section, of the central or power mechanism proper when in position for action. Fig. 4 is a vertical longitudinal section of a brake-shoe and the brake-bar. Figs. 5 and 6 are views showing different arrangements of my power mechanism and the brakes, as will be seen.

A in the drawings represents a car-axle; *a*, car-wheels; B, a brake; C, power mechanism, and D starting-rod. The brake B consists of an ordinary brake-bar *b*, attached to ordinary suspending-springs *b'*, whereby the brake-shoes b^2 are prevented from touching the wheels when the brake is "off." The brake-bars may be provided with sockets b^3 and springs b^4 therein and connected with the brake-shoes by means of screw-bolts b^5 in such manner that a space is left between the bar *b* and shoes b^2, thereby giving sufficient play to the brake-bar under varying pressure as to avoid stoppage of the wheels, as will be hereinafter explained. The brake-bar is provided with a stout metal bail b^6, which extends beyond the axle A, and is there provided with the main lever *c* of the power mechanism C. This main lever *c* has a forked end portion *c'*, to which a roller or pulley c^2 is pivoted. About the middle of its length two levers c^4 are pivoted by means of a horizontal pin c^3 to the lever *c*—one to the right and the other to the left—said levers c^4 having forked end portions *c'* and pulleys c^2 pivoted thereto. The three pulleys c^2 are arranged in line with each other, and the levers c^4 are supported in line with the lever *c* by means of a transverse bar c^5, fastened to the lower surface of the lever *c*. By this construction the levers c^4 can be raised above the lever *c*, but they cannot swing below it. A toggle-lever *d* is suspended from the bottom of the car *d'* and supports by means of a pin d^2 the lever *c*. To the fulcrum d^3 of the toggle-lever the rod D is pivoted, which in practice is extended to the next car-truck and there pivoted to a similar toggle-lever employed with a brake similar to that above described. The several rods D of the several cars of a train are connected by means of chains, the last of which is connected to the engineer's cab. Opposite the pulleys or rollers c^2 the axle A is provided with three rings a^3 a^3 *a'*, of which the outer two a^3 are of equal diameter and concentric, while the middle one *a'* is of smaller diameter and eccentric and is so arranged that the portion of its surface most remote from the center protrudes about one-eighth of an inch beyond the surfaces of the rings a^3 right and left. When the brakes are not in use or off, the rods D are pulled forward by the engineer and the toggles are shortened, one of said shortened toggles being shown by dotted lines in Fig. 2. With the toggles in this position the levers *c* are held up, as the dotted lines in Fig. 2 show, and the brake-bars *b* are held away from the wheels by the springs b^4. When it is desired to put the brakes on, the engineer will unhook the chain connected with the bars D and allow the said chain to become slack, thereby causing the bars D to allow the toggles to straighten downwardly to their full length by reason of the weight of the levers *c*, and the levers *c* will descend until their rollers c^2 are opposite the axles A and their eccentric rings *a'*. The levers *c* and rollers c^2 complete their descent when the contracted portions of the revolving rings *a'* have moved opposite them, after which the rings *a'* with their larger portions push the rollers

c^2 and levers c away, giving the side rollers c^2, which have been riding upon the outer rings a^3, a chance to descend to the same level with the middle rollers. This descent is facilitated by the excess of diameter of the ring portions a^2 over the diameters of the rings a^3, as before described, whereby the outer pulleys c^2 are at every revolution of the axle removed from the rings a^3 and enabled to descend without friction during this time. The bails b^6 are now forced from the axles, and the brake-bars b and shoes b^2 are drawn to the wheels, upon which the shoes bear with a force regulated by the springs b^4. The pressure of the brake-shoes upon the wheels is not a uniform pressure, but varies with every revolution of the wheel in accordance with the leverage of the concentric surfaces of the rings a^3 and the eccentric surfaces a^2 of the rings a'. This operation causes for about one-fouth of the revolution a stronger pressure on the brake-shoes, and by this means retards the revolution of the wheels more readily than can be done by a uniform pressure.

To prevent excessive pressure on the brake-shoes, causing the wheels to slide on the track, the brake-shoes may be provided with one or more screw-bolts b^5, whereby they may be adjusted nearer to or farther away from the brake-bars b, and thus decrease or increase the tension of the springs b^4. After the tension of the springs b^4 has been thus adjusted the brake-bars b are adjusted on the bails b^6 by means of nuts b^7 on the threaded ends of the bails.

In Figs. 1 and 2 I have shown the invention in its simplest construction; but it would be unnecessary in practice to have a power mechanism for each brake-beam. The power mechanism is sufficiently strong to operate all the brakes of one car, and I have in Fig. 5 shown how two brakes can be connected with one power mechanism. In this construction the power mechanism and bail b^6 are of the description heretofore given and need not be repeated; but to the head of the bail two levers E are pivoted, as at e, which are fulcrumed at e' to fixed bars e^2 or to suitable brackets below the car. Beyond the fulcrums said levers are pivoted, as at e^3, to two connecting-rods b^7, which are fastened to a second brake-bar b, constructed similarly to the one heretofore described.

In cases where it is desirable to use two power mechanisms C to each truck of a car I prefer to arrange them in opposite directions, as shown in Fig. 6.

It is easily seen that when all the bars D are properly connected the engineer can with great ease and promptness operate the brakes, as it is simply necessary for him to pull the chain connected with said bars, and thereby instantly and instantaneously release all the brakes of his train, and in order to put the brakes "on" the chain will be slackened by the engineer as far as it will go, and the brakes are instantly caused to bear with full force upon the wheels.

The construction shown in Figs. 1 and 2 has also this great advantage, that the force or pressure of the brakes is not sustained by the car bottoms, platforms, or trucks, but by the axles of the wheels, whereby not only all the strains on the lower car-frame upon the king-bolts and trucks are avoided, but, the wheels not being subjected to forward or rearward pressure, as in the old constructions, their journals and journal-boxes are rendered more enduring in wear and less liable to breakage.

In operating the brakes the bar D may be moved forward or backward for the purpose of releasing the brakes, as in both cases the levers c are raised.

In case of disconnecting or parting of trains the bars D of the rear separated portion are set free, and the brakes are instantly applied to the wheels, thereby stopping the said rear separated portion of the train, whereby the engineer is permitted to back up his portion with perfect safety for the purpose of reuniting the train.

What I claim as my invention is—

1. In a railroad-car brake, a brake-bar b, in combination with a power-supplying device comprising concentric rings a^3 a^3 and an eccentric ring a', all on the axle of a pair of wheels, a mechanism for transferring power to the brake-bar, comprising bail b^6, lever-arm c, provided with roller c^2 and with levers c^4, also having rollers c^2 c^2, and a suitable shipping mechanism, substantially as described.

2. In combination with a revolving wheel-axle, the rings a^3 a', the brake-bar b, bail b^6, lever c, having levers c^4, rollers c^2, and the toggle-lever d, substantially as described.

3. In combination with a revolving wheel-axle, the concentric rings a^3, the eccentric ring a', having an operating-surface a^2, the lever c, having roller c^2, and suitable connections with a brake, substantially as described.

4. In combination with a revolving wheel-axle having the rings a^3 a', the power mechanism C, as described, the adjustable bail b^6, brake-bar b, brake-shoes b^2, adjusting screw-bolts b^5, and spring b^4, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

JOHN D. METS.

Witnesses:
JOHN L. BUTTEL.
MONROE M. CADY.