

(No Model.)

2 Sheets—Sheet 1.

A. J. HARPOLE.
AUTOMATIC CAR BRAKE.

No. 586,489.

Patented July 13, 1897.

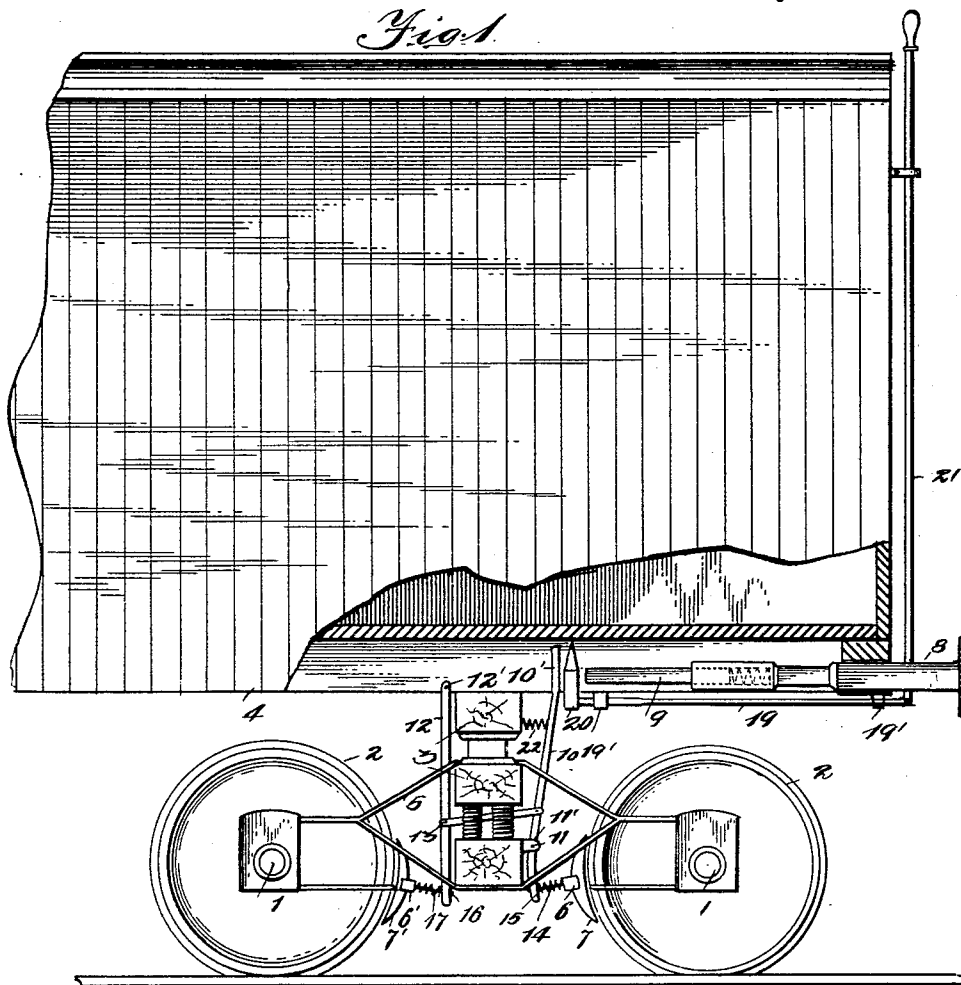
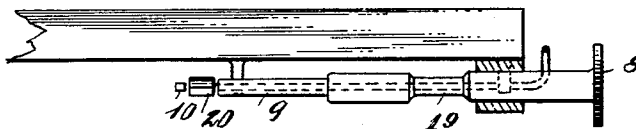


Fig. 3



Witnesses

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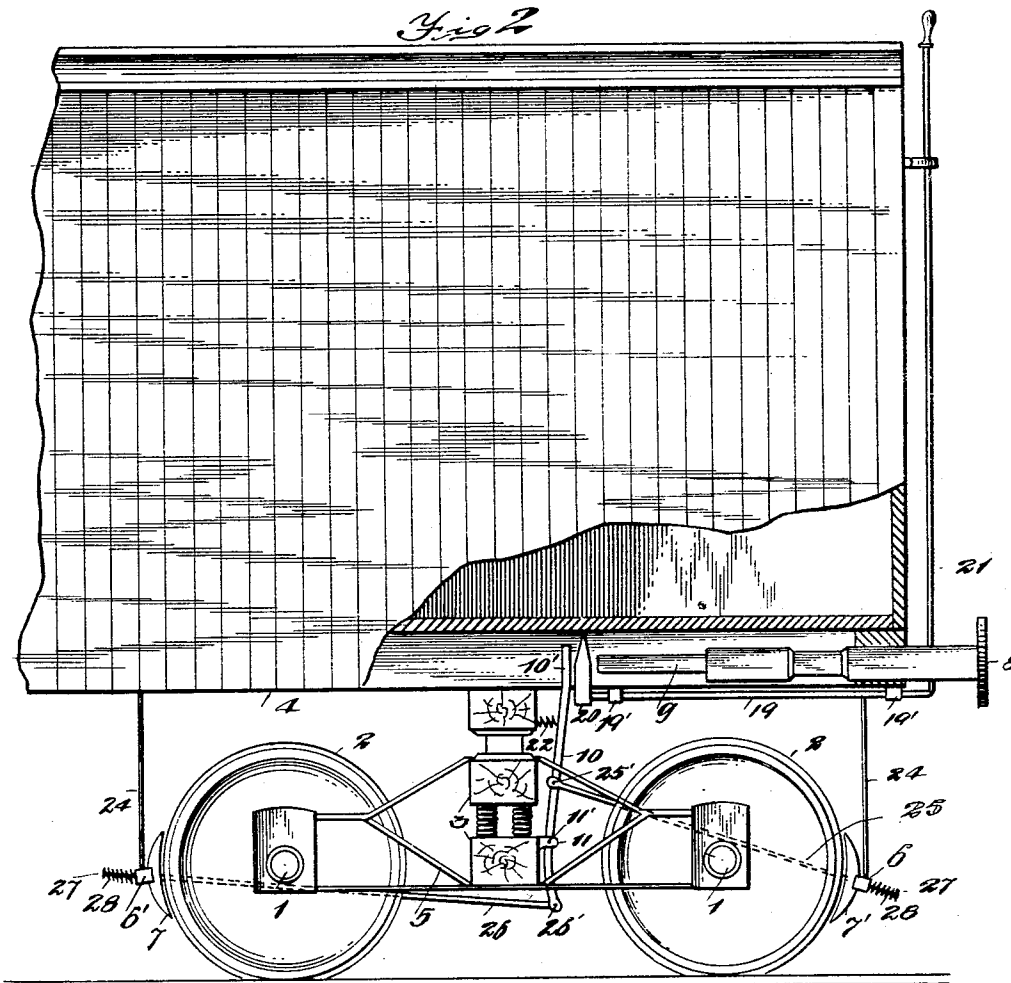
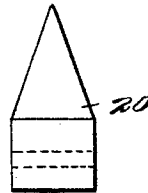
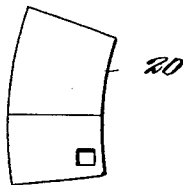


Fig. 4

Fig. 5



Witnesses

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UNITED STATES PATENT OFFICE.

ANDREW J. HARPOLE, OF UNION CITY, TENNESSEE.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 586,489, dated July 13, 1897.

Application filed December 28, 1896. Serial No. 617,218. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. HARPOLE, a citizen of the United States, residing at Union City, in the county of Obion and State of Tennessee, have invented certain new and useful Improvements in Automatic Car-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 improvements in an automatic car-brake designed to be applied and operated in conjunction with the endwise-movable draw-bar with which each car of a train is equipped, whereby the brakes on each car are applied independently of those on every car of the train when the speed of the train is slackened and the draw-bars are pressed inward.

I aim to provide a simple brake mechanism which may be applied to or used in connection with ordinary hand-brakes for freight or passenger cars without changing in any material respects the constructions of the car or its hand-brake mechanism for the purpose of equipping each car at a minimum expense with an automatic brake.

A further object of my invention is to construct and arrange the automatic-brake mechanism so as to render it applicable to those types of hand-brakes in which the shoes or blocks are used on the outside of the car-wheels as well as on the inside of said wheels.

A further object of my invention is to provide means for operation by the brakeman or other train attendants designed to adjust and control the automatic-brake mechanism and throw it into position for service with the draw-bar or buffer-bar and out of operative relation thereto, whereby the mechanism may be used as an automatic brake or the brakes may be operated in the usual way by hand or by the devices under the control of the engineer.

A further object of my invention is to provide means to avoid the too rigid application of the brakes to the wheels to prevent the displacement or lurching of the articles of freight and other merchandise in or on the cars, as well as reduce to a minimum the dis-

comforture and danger to the trainmen and passengers which may be due to an effort to stop the train quickly.

With these ends in view my invention consists in the combination, with brake-beams and a slidable bar of a draw-bar or buffer, of a lever or levers suitably fulcrumed between a pair of car-wheels, connections between said lever and the shoe-carrying brake-beams, and means intermediate between said lever and the slidable draw-bar or buffer-bar to actuate the lever on an inward movement of the slidable bar.

My invention further consists in controlling the brake-actuating lever by a suitable form of detainer, preferably a spring, to normally hold the brake-shoes free from engagement with the car-wheels.

The invention further consists in the provision of means for adjusting the brake in or out of operative relation to the slidable buffer or draw-bar at the discretion of the brakeman, which means consist, preferably, in the employment of a rock-shaft having a suitable lever or other device for its operation by hand and an arm mounted on the rock-shaft to be operated thereby, said arm arranged to be interposed between the brake-controlling lever and the slidable buffer or draw-bar to form the operative connection between the said parts, and also arranged to be thrown by the rock-shaft out of operative relation to said lever and the slidable bar, and thus permit the slidable bar to move endwise without affecting the brake-controlling lever when it is desired to operate the brakes by hand or by devices under the control of the engineer.

The invention further consists in the employment of a cushion-spring forming part of the connection between the brake-controlling lever and the brake-shoe beam, which spring serves to avoid the too-rigid application of the brake-shoes to the car-wheels; and the invention consists, further, in the novel combination of devices and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, I have illustrated different embodiments of my brake mechan-

ism to show its adaptation to brake-shoes arranged between and outside of the car-wheels, referring to which drawings—

Figure 1 is a side elevation of my improved brake used in connection with brake-shoes arranged between the car-wheels to be forced against the opposing faces thereof, a part of the car-body and running-gear being indicated by dotted lines. Fig. 2 is a view similar to Fig. 1, but showing my invention modified to enable its use in connection with brake-beams and shoes that lie outside of the car-wheels. Fig. 3 is a detail view showing in plan the relation of the rock shaft and arm to the slidable draw-bar or buffer and the brake-controlling lever. Figs. 4 and 5 are detail views of the arm that is to be thrown into and out of operative relation to the slidable bar and the brake-lever.

Like numerals of reference denote like parts in all the figures of the drawings.

I will first proceed to describe in detail the embodiment of the brake illustrated by Fig. 1 of the drawings, in which 1 1 are the usual axles, 2 2 the wheels, 3 are the truck and bolster beams, 4 is a part of the car-body, and 5 is a part of the truck-frame, all of which are of the usual type well known to those skilled in the art. In the construction shown by this figure the brake-beams 6 6' and the brake-shoes 7 7' on said beams are disposed or arranged between the car-wheels in order that the brake-shoes may press against the opposing faces of said wheels. The brake-beams are suspended in the usual or any preferred way, as by rods, (not shown,) which may be attached pivotally to the brake-beams and the car-sills.

8 designates the endwise-movable draw-bar or the buffer-bar, with either of which devices my automatic brake appliances may be combined. This draw-bar or buffer-bar may be any of the usual type well known to those skilled in the art. To make this slidable bar long enough to operate in conjunction with my brake mechanism, I provide said bar with an extension 9, which is in the form of a rod or stem attached to the slidable bar and extending backwardly from the same for a suitable distance. The stem 9 may be made as an integral part of the slidable buffer-bar or draw-bar, or it may be attached thereto in any suitable way, the object being to prolong or extend the slidable bar to a point above and between the pair of car-wheels.

10 is the brake-controlling lever. It is arranged in an upright or vertical position and between the car-wheels, so that the lever may be supported on the truck-frame in a position for connecting it through suitable devices with the brake-beams 6 6', and its upper end may lie in operative relation to the extended stem 9 of the slidable bar 8, said lever 10 being disconnected from the slidable bar 8.

To one of the beams of the truck is fas-

tened a bracket or plate 11, having ears or lugs arranged to embrace the upright lever 10, and said lever is pivotally attached to this bracket or plate, whereby the lever is fulcrumed at a point intermediate of its length, as at 11', thereby forming the long and short arms shown by Fig. 1. It will be noted that this lever lies on one side of the truck-beams in position for connecting it directly with one of the brake-beams and shoes 6 7'; but to make the lever operate the other brake-beam and shoe 6' 7' I resort to the use of a second lever 12, arranged on the opposite side of the truck or bolster beams. These two levers 10 12 are operatively connected together by a link or pitman 13. The secondary lever 12 is fulcrumed at its upper end to one of the car-sills, as at 12', and its lower end is free to move toward or from the car-wheel, the pitman being pivotally attached to the secondary lever 12 at a point between its fulcrum 12' and the point of attachment of the devices which connect said lever 12 to its proper brake-beam 6'.

The primary lever 10, or, as it has been called heretofore, the "brake-controlling" lever, has its short arm, at the lower extremity thereof, curved or bent outward from the truck-beam, and through an eye or opening in said lever 10 passes a stem or rod 14, which is attached to the brake-beam 6, the end of said rod 14, at the point where it passes through the eye of said primary lever, having a head or projection, as shown. On the rod or stem 14 is fitted a coiled spring 15, which is arranged between the short arm of the lever 10 and the brake-beam 6, and this spring is arranged to be compressed by the lever 10 when its short arm is thrown forward, so that it forces the brake-beam 6 and shoes 7 upon the car-wheel with a yielding pressure proportionate to the leverage and pressure exerted by the lever 10 and the force of the slidable bar 8.

The link or pitman 13 is attached to the primary or brake-controlling lever 10 at a point above its fulcrum 11', as shown, and the levers 10 12 are thus connected together in a manner to spread or throw apart the lower ends thereof when the upper end or long arm of the primary lever 10 is forced backward on an inward movement of the slidable bar 8. The lever 12 has its lower end connected to the brake-beam 6' in a manner similar to the connection between the lever 10 and brake-beam 6—i. e., by a headed rod 16, which passes through an eye in lever 12 and is fastened to the brake-beam 6', and by a cushion-spring 17, fitted on said rod 16 and interposed between the end of lever 12 and the brake-beam 6', which carries the brake-shoe 7'.

The upper extremity or long arm of the primary lever 10 is preferably bent, as at 10', at an angle to the length of the lever which stands off from the truck and car-bolsters, and this angular end 10' of the brake-control-

ling lever lies a short distance in rear of the extremity of the stem 9 of the endwise-movable buffer or draw-bar in order that the latter may have the proper sliding movement without affecting the brake-controlling lever whenever it is desired that the brake may not be operated automatically by the endwise movement of the draw-bar or buffer, so that the brakes may be operated in the usual way by hand or by devices under the control of the engineer.

To enable the brakeman or other train attendant to adjust the brake into condition for service with the endwise-movable bar 8 or its stem 9, I provide the rock-shaft 19 and arm 20, which form the operative connections between the slidable bar 8 and the brake-controlling lever 10 when it is desired to apply the brake-shoes automatically to arrest a train. This rock-shaft 19 is journaled in suitable bearings 19', attached to one of the car-sills, so as to make the shaft occupy a position below the slidable bar, one end of said rock-shaft extending beyond the end of the car and the other end of the shaft terminating close to the lever 10.

To the protruding front end of the rock-shaft is connected a lever or rod 21, which extends up to the platform or the roof of a car for the purpose of operating the shaft 19. On the rear end of the shaft 19 is mounted the arm 20 in a manner to slide. The arm 20 may slide on the shaft 19, or the shaft itself may slide in the bearings that support it beneath the car. I prefer to make the arm slidable on the shaft, and to this end the rear end of the shaft is made square and the arm has a square hole in it to fit on the shaft for the purpose of making the arm slidable thereon when the slidable bar is pressed inward. The arm 20 turns or rocks with the shaft when it is actuated by the rod or lever, and thus the arm may be interposed between the slidable bar and the lever 10 to be acted on by the bar and to press the lever 10 backward, or said arm 20 may be thrown by the shaft to one side of a line between the slidable bar and the lever 10 to permit the bar to move inward without affecting the position of the brake-lever 10.

A spring 22 is arranged to press against the long arm of the brake-controlling lever 10 for the purpose of forcing said arm toward the stem 9 of the buffer or draw-bar and to keep the brake-shoes normally free from contact with the car-wheels. As the lever 10 is held by the spring normally toward the stem 8 and as the buffer or draw-bar may be pressed inward at a time when it is desired to throw the automatic brake into service I make the arm 20 with the beveled faces shown by Fig. 5 in order to give the arm a wedge formation and to enable it to be pressed between the brake-lever 10 and the stem 9 at any or all times and without respect to the position of the parts 9 10.

In operation the rock-shaft 19 is turned to

a position where the arm 20 is in alinement with the stem 9 and the brake-lever. When the cars abut and the draw-bar or buffer is forced inward, the stem 9 is pressed back and carries with it the arm 20, which slides on the shaft 19, and said arm presses backward the long arm of the lever 10. This movement of the lever forces forward the short arm at the lower end and pushes backward the link and the lever 12, thus spreading the lower ends of the levers and forcing the brake-shoes upon the wheels, the pressure of the shoes being proportionate to the momentum of the train and the suddenness of the stop. When the cars separate and the draw-bar is moved forward in the usual way, the spring 22 forces the upper end of the lever 10 forward, and the brake-shoes are thus released and the arm 20 forced forward with said upper end of the lever. To enable the brakes to be operated in the usual way, the rock-shaft 19 is turned to move the arm 20 to a position out of alinement with the stem 9 and the brake-shoe lever 10 in order that the draw-bar or buffer may move with the stem 9 without affecting the brake-lever 10 or applying the brake-shoes.

In the embodiment of my invention shown by Fig. 2 of the drawings the parts of the automatic braking mechanism are arranged to operate in connection with the brake-beams 6 6' and shoes 7 7', which are disposed on the outside of the car-wheels, said brake-beams 6 6' being suspended by rods 24, pivotally attached thereto and to the car-sills. I employ the rock-shaft 19, the arm 20 thereon, and the brake-controlling lever 10, arranged for service substantially as hereinbefore described, but I dispense with the secondary lever 12 and the link or pitman which connects the two levers. The brake-lever 10 is connected with the brake-beams through the rods 25 26, which are pivotally attached to said lever at points above and below its fulcrum, as at 25' 26', respectively. The rods 25 26 pass through openings in the brake-beams, and at their free ends have the heads or enlargements 27, against which bear the cushion-springs 28, which are fitted on the rods between the headed ends 27 and the brake-beams 6 6'. The spring 22 normally holds the lever 10 in a position where the rods 27 28 are forced apart and the brake-shoes are free from the car-wheels, but when the buffer or draw-bar and the arm 20 are forced backward by the cars coming together the upper end of the lever 10 is forced back and the rods 25 26 are drawn together and the shoes are forced upon the car-wheels with a yielding pressure proportionate to the momentum of the train and the suddenness of the stop.

I prefer to make the several rods with forked ends to embrace the parts to which they are to be pivotally connected, thus forming strong and durable joints between the parts.

It will be noted that the brakes on each car are independent of all others, and thus a safe and reliable means is provided on each car for arresting its motion, which means is not liable to fail when needed.

I am aware that changes and modifications in the form and proportion of parts and in the details of construction of the devices herein shown and described as the preferred embodiments of my invention can be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention.

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

1. The combination with brake-beams and a slidable buffer or draw-bar, of a brake-controlling lever connected with said brake-beams, a shaft, and an arm slidable longitudinally on said shaft and forming an operative connection between the brake-controlling lever and the buffer or draw-bar, as and for the purposes described.

2. The combination with brake-beams and a slidable buffer or draw-bar, of a brake-controlling lever, a rock-shaft situated below the buffer or draw-bar and having means for operating the same manually, and an arm mounted on said rock-shaft to turn therewith and capable of movement with said buffer or draw-bar to actuate the brake-controlling lever, as and for the purposes described.

3. The combination with brake-beams and a slidable buffer or draw-bar, of a brake-controlling lever, a rock-shaft, and an arm fitted on the rock-shaft to slide thereon and rock therewith and arranged to be thrown into or out of operative relation to the buffer or draw-bar and the brake-controlling lever, substantially as described.

4. The combination with a slidable draw-bar or buffer, of a spring-actuated, brake-controlling lever, and a wedge-like rocking arm arranged to be thrust between said lever and buffer or draw-bar, for the purposes described, substantially as set forth.

5. The combination with a slidable draw-

bar or buffer, brake-beams, and shoes, of a brake-controlling lever independent of said draw-bar or buffer, a stem movable with said draw-bar or buffer and terminating adjacent to the brake-controlling lever, a rock-shaft having means for operating the same, an arm slidably fitted on said rock-shaft and arranged to rock therewith so as to be thrown into and out of operative relation to the stem and lever, and connections between the brake-beams and the brake-controlling lever, as and for the purposes described.

6. The combination with brake-beams and a slidable draw-bar or buffer, of a brake-controlling lever, situated between the brake-beams, a rock-shaft adjacent to the slidable draw-bar or buffer, a rocking and sliding arm carried by said rock-shaft and adapted to be adjusted between said draw-bar and the brake-controlling lever, and operative connections including cushion-springs between the brake-controlling lever and the brake-beams, for the purposes described substantially as set forth.

7. The combination with brake-beams and shoes thereon, of a brake-controlling lever, rods connected with said brake-beams and with said lever, and cushion-springs fitted on said rods and seated directly against the brake-beams to be held in yielding contact with said brake-beams, and to force the shoes with a yielding pressure upon the car-wheels, substantially as described.

8. The combination with brake-beams, and a slidable draw-bar or buffer, of a brake-controlling lever to be actuated by said draw-bar or buffer, slidable rods operatively connected with said lever and fitted slidably in said brake-beams, and cushion-springs forming part of said connections between the lever and beams, said springs being fitted on said rods and seated directly on said brake-beams, substantially as described, for the purposes set forth.

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

ANDREW J. HARPOLE.

Witnesses:

W. H. GRIFFIN,
JNO. T. WALKER.