3 Sheets--Sheet 1.

J. M. CONNEL.

Car-Brakes.

No. 157,580. Patented Dec. 8, 1874.

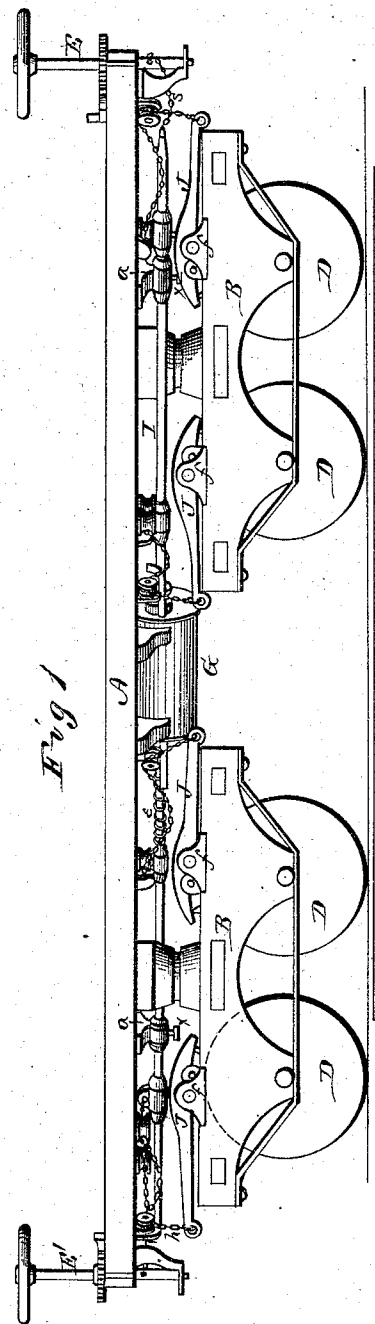

Fig. 1

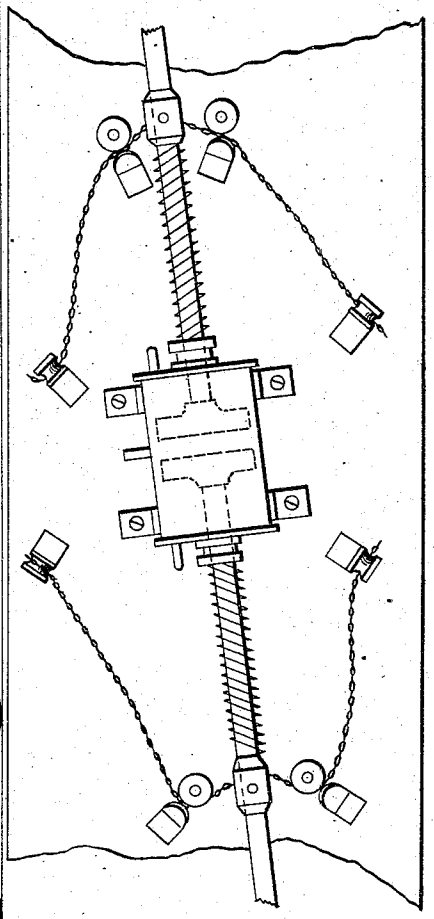

Fig. 2

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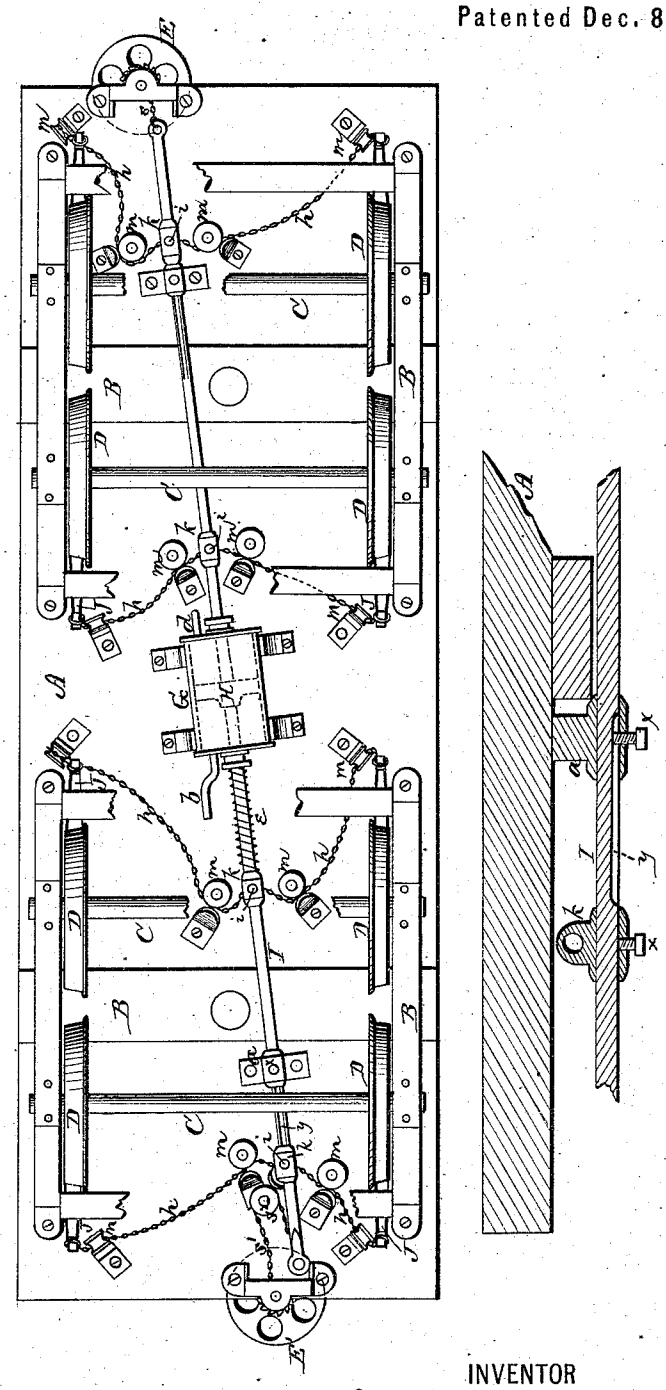

Fig 2

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3 Sheets--Sheet 3.

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Fig 3

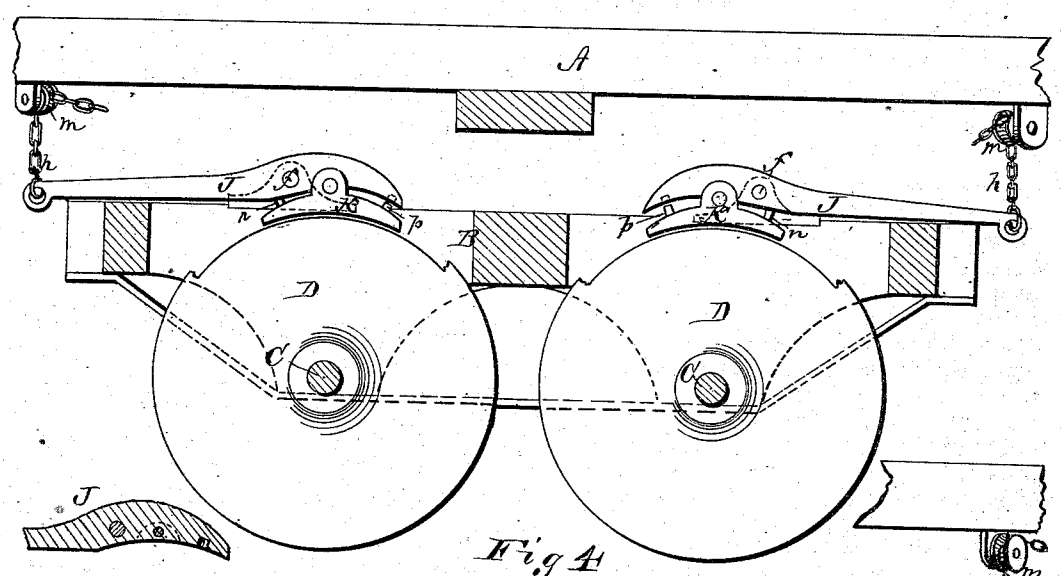


Fig 4

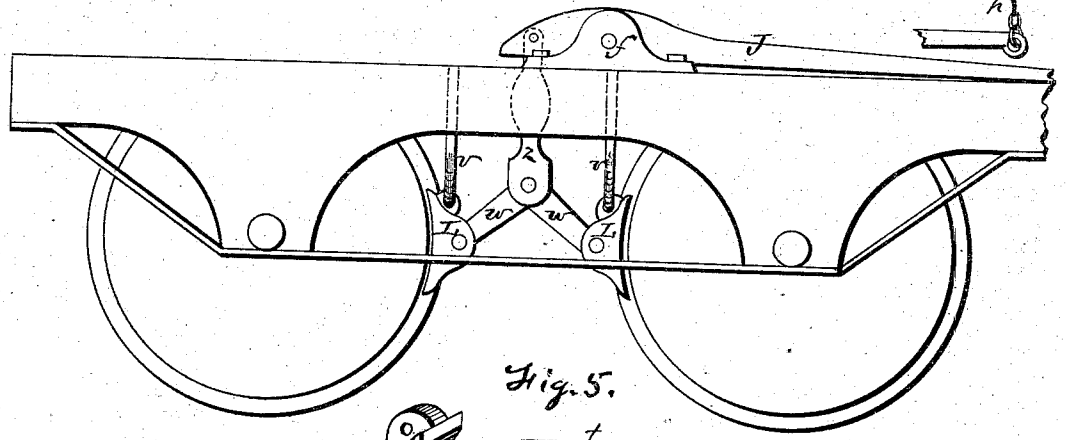
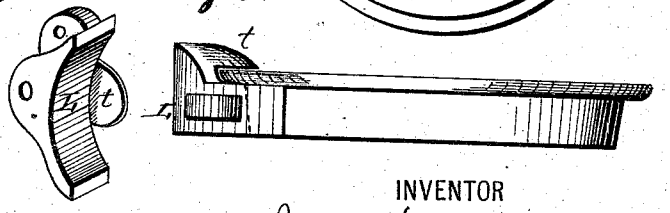


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES M. CONNEL, OF NEWARK, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT TO R. M. WEAVER, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **157,580**, dated December 8, 1874; application filed November 28, 1874.

To all whom it may concern:

Be it known that I, JAMES M. CONNEL, of Newark, in the county of Licking, and in the State of Ohio, have invented certain new and useful Improvements in Car-Brakes; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a car-brake to be operated by steam or air, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of the bottom of a car with trucks and car-brake embodying my invention. Fig. 2 is a bottom view of the same. Fig. 3 is an enlarged longitudinal section through one of the trucks. Figs. 4 and 5 represent a modification of my invention. Fig. 6 is a bottom view, showing the use of two pistons in the cylinder.

A represents the bottom or platform of a railroad-car. B B are the truck-frames underneath the same, and C C are the axles with wheels D D, all constructed in any of the known and usual ways. E E′ represent the ordinary hand-brake appliances located at each end of the car, and on opposite sides of the center, so that a line drawn between them will run nearly diagonally with the car-bottom A. Under the center of the car is secured a cylinder, G, with a piston, H, secured to a rod, I, passing through both heads of the cylinder, and through boxes or bearings, *a a*, attached to the under side of the car. The cylinder G and piston-rod I are arranged so as to be on a line parallel to the line connecting the two hand-brake shafts E E′. The cylinder G is provided with an inlet-pipe, *b*, for the admission of air or steam to drive the piston H in the direction of the hand-brake shaft E, and at the opposite end of the cylinder is an outlet-pipe, *d*, for the exit of the atmospheric air in front of the piston.

A spring, *e*, arranged on the rod I, between the cylinder G and the hand-brake shaft E′, throws the piston back as soon as the steam or air is shut off. On each side of each truck B, on the top thereof, are pivoted two levers, J J, in suitable boxes or bearings *f f*, firmly attached to the truck-frame. The outer ends of these levers are, by chains *h h*, connected with adjustable collars or sleeves *k k*, fastened on the piston-rod I by means of set-screws *i i*. The chains *h h* pass around pulleys *m m*, arranged on the under side of the car, in such a manner that when the piston-rod I is moved in the direction of the hand-brake shaft E, the outer ends of the levers will be pulled upward on a vertical line. At a suitable point inward from the fulcrum of each lever J, and to the under side thereof, is pivoted a brake-shoe, K, arranged to be applied to the top of the wheel on a line vertical with the car-axle.

The inner end or toe of the shoe is made heavier than the heel, and from the upper side of the heel or outer end of the shoe projects a pin, *n*, which acts as a stop against the under side of the lever when the shoe is raised from the wheel, so as to hold the shoe parallel therewith and prevent any friction of the toe of the shoe against the wheel. On the toe of the shoe is a pin, *p*, which enters a corresponding hole made in the inner end of the lever when the brake is applied, and acts as a guide in the application of the brake. The outer end of the lever J is made heavy enough to overbalance the weight of the inner end thereof and the shoe, so that as soon as the chains *h* are slackened up the brake-shoe will at once be lifted up from the wheel by the gravity of the outer end of the lever.

By applying the brakes on top of the wheels, and in or nearly in lines vertical with the axles, the weight of the car is, so to say, taken off from the center of the wheels and applied at a point directly opposite to the point of contact with the rails, and thereby the greatest possible amount of leverage is obtained to stop the car.

The hand-brake shaft E is, by a chain, *s*, connected with the end of the piston-rod I, so as to pull the same and apply the brakes by hand. The shaft E′ is, by a chain, s^1, also connected

with the rod I; but this chain s^1 passes around a pulley, s^2, so that when this shaft is turned the rod I will be pulled away from it—that is, move in the same direction as when moved by the piston H or by the shaft E.

By this arrangement it will be seen that the brakes may be applied either by steam or air in the cylinder G, or by hand from either or both ends of the car.

The collars or sleeves *k*, to which the chains *h* are attached, are adjustable on the rod I, so that they may be easily changed thereon in case of any expansion or contraction of said chains. Through each bearing *a* for the rod I passes a screw, *x*, or its equivalent, which enters a longitudinal groove, *y*, in said rod, whereby the rod is prevented from turning around in the bearings.

Instead of using one piston in the cylinder, two may be used, in which case the steam or air should enter the cylinder in the center, between the two pistons, and force them outward. Each piston has then a piston-rod, and the connections between said rods and the brake-levers must be arranged to correspond. The arrangement of the chains and pulleys would then be the same for both trucks. The connections between the piston-rods and the hand-brake shafts are the same as described for the shaft E.

Instead of using one lever for each shoe on each side of the truck, one lever may be used to apply two shoes on the inner sides of the two wheels on each side of the truck. In this case I use shoes L, constructed as shown in Fig. 4, and provided with lips *t* on their inner sides, to overlap the flanges of the car-wheels. These shoes are suspended from the truck-frame by means of links or springs *v v*, and are connected together by toggle-levers *w w*. These levers are, by a rod, *z*, connected with the inner end of the lever J. When the outer end of this lever is raised in the same manner as above described, the rod *z* presses the toggle-levers *w w* apart and forces the shoes L against the wheels. As soon as the pressure is removed the rod *z* raises the middle joint of the toggle-levers, and the shoes fall away from the wheels of their own gravity, aided by the springs *v*, if springs are used.

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

1. The arrangement, in a steam or air brake, of the cylinder G, with one or two pistons, H, and one or two piston-rods, I, diagonally under the bottom of the car, on a line with the hand-brake shafts E E′, and connected therewith, substantially as and for the purposes herein set forth.

2. The lever J, in combination with one or more brake-shoes, and the piston-rod I, chains *h*, and pulleys *m*, substantially as and for the purposes herein set forth.

3. The adjustable sleeve *k*, in combination with the piston-rod I, chains *h*, and pulleys *m*, substantially as and for the purposes herein set forth.

4. The combination, with two car-trucks, of the cylinder G, arranged between them, the piston or pistons H, the diagonal piston rod or rods I, the chains *h*, pulleys *m*, adjustable sleeves *k*, spring *e*, levers J, and brake-shoes, all substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of November, 1874.

J. M. CONNEL.

Witnesses:
J. M. MASON,
C. M. ALEXANDER.