W. L. CARD.

Steam-Brake for Locomotives, &c.

No. 212,439. **Patented Feb. 18, 1879.**

FIG. 1.

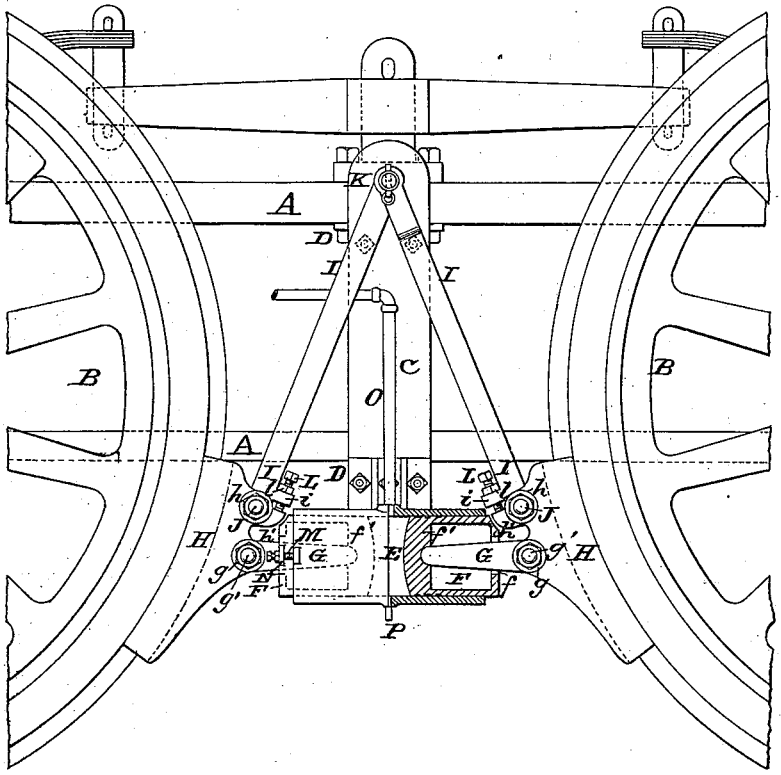


FIG. 2.

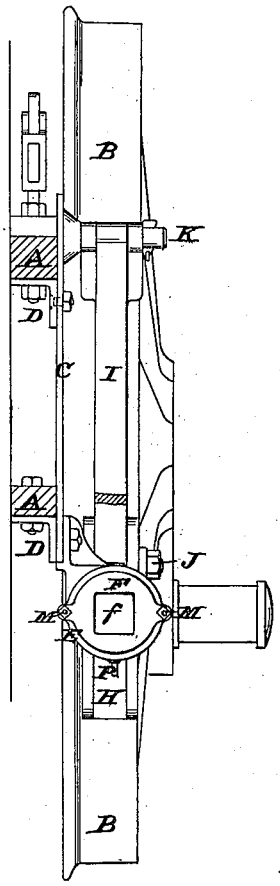
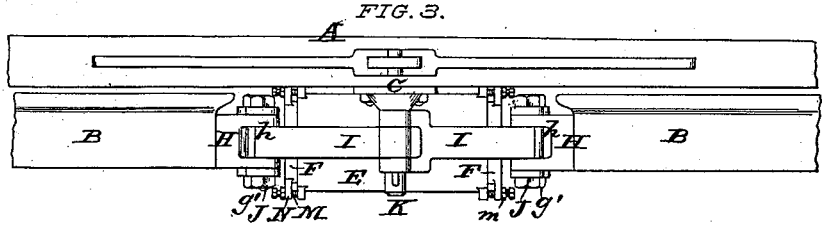


FIG. 3.



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WILLIAM L. CARD, OF MOBERLY, ASSIGNOR TO SYLVESTER WATTS, OF ST. LOUIS, AND EDWIN E. CHASE, OF ST. CHARLES, MISSOURI, ONE-THIRD TO EACH.

IMPROVEMENT IN STEAM-BRAKES FOR LOCOMOTIVES, &c.

Specification forming part of Letters Patent No. **212,439**, dated February 18, 1879; application filed December 28, 1878.

To all whom it may concern:

Be it known that I, WILLIAM L. CARD, of Moberly, Randolph county, and State of Missouri, have invented a certain new and useful Improvement in Brakes for Locomotives, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvement relates to that class of brakes in which a steam or air cylinder is located between the wheels, to apply the brakes to both wheels simultaneously. In my apparatus the cylinder contains two pistons, working in opposite directions in the cylinder, and each directly connected with a single brake-block.

The first part of my improvement consists in the method of hanging both brake-blocks from a single pivot or stud upon the upper end of the supporting plate or bracket, the downward pull upon one link or hanger being compensated by the upward push upon the other. The stud and engine-frame are thereby very nearly relieved of all strain. As the said links or hangers have an inclined position, the weight of the parts will tend to draw back the shoes from the wheels and push the pistons back into the cylinder when the steam-pressure is withdrawn.

The second part of my improvement consists in the manner of connecting the brake-blocks to the pistons, so as to allow of their easy removal and permit their oscillatory movement. This connection consists of a pin passing through a mortise in the shell of the piston, and whose toe rests in a recess within, as shown.

The third part of my improvement consists in the combination of the cylinder and pistons, brake-block, and supporting-links or hangers with a supporting plate or bracket, ready for attachment to the locomotive-frame, as set forth.

The fourth part of my improvement consists in a screw turning in a lug at the back of each link or hanger, and resting against a projection at the rear of each brake-block, to prevent the tilting forward of the top of the brake-block beyond a certain point, at the same time allowing the brake-block to turn in the other direction to adjust the face of the shoe to the tread of the wheels.

The fifth part of my improvement consists in the described manner of arresting the backward movement of the brake-block.

In the drawings, Figure 1 is a side elevation, with part of the cylinder and one piston in section. Fig. 2 is a transverse section, with the connecting-pin of the brake removed from the piston. Fig. 3 is a top view of the parts shown in Fig. 1.

At A A are shown parts of the upper and lower locomotive-frames. Parts of the two driving-wheels are shown at B. C is a supporting plate or bracket, to which all the parts of the brakes are attached. The supporting-plate or bracket C is connected to the frame A A by angle-plates and bolts at D D, or by bolts alone, in a vertical position about in the plane of the wheel-flanges. E is the cylinder, attached to the outer side of the supporting plate or bracket at its lower end. The axis of the cylinder is horizontal. The cylinder is open at both ends, said ends being presented toward the wheels. In each end of the cylinder works a piston, F, having in its outer end an axial mortise, *f*, to receive a pin or piston-rod, G, having a rounded bearing against the piston at *f'*, and having at the outer end an eye, *g*, for hinge-connection with the brake-block H. The hinge consists of a screw or key bolt, *g'*, passing through ears on the brake-block H and the eye in the pin G. The hinge-connection is such that the brake-block may be readily separated from the pin or piston-rod G for renewal when worn out.

The brake-block has a recess, *h*, to receive the lower end of the supporting link or hanger I and the outer end of the piston-rod G. The brake-block is secured to the link or hanger by a pintle-bolt, J, passing through the brake-block and the lower end of the link or hanger. The links or hangers are supported on a pivot-stud, K, extending from the supporting plate or bracket C, near the upper end.

Each brake-block is balanced on the point g' and suspended on the points J, and the preponderance of its weight being on the wheel side of these points, that side tends to descend and tilt the upper end toward the wheel. To prevent this tilting of the brake-block and provide means for holding it in the proper position, I form at the top of the brake-block a projection, h', upon which bears the point of a screw, L. Said screw screws through a lug, i, upon the under side of the link or hanger I, and is fitted with a back-nut, l, to hold it (the screw) in position.

In practical use the brake-block would be so adjusted that the lower end of the shoe would be somewhat more distant from the wheel than the upper end, and the shoe would come to position upon the wheel as it approaches. Thus when the shoe is in braking position upon the wheel the point of the screw L and the projection h' would be a small distance asunder.

I will describe the device to limit the backward movement of the brake-block from the wheels. This consists of screws M, screwing in lugs N upon both sides of the piston, the points of said screws coming in contact with the cylinder when the brake-shoe has left the wheel a proper distance. The screws M have upon them jam-nuts m to hold them in position. It will be understood that as the brake-shoes become worn it will not be necessary that the pistons should enter so far into the cylinder as to break the contact of the shoe and wheel, and the screw M will therefore be screwed toward the cylinder as the brake-shoes become worn away.

The cylinder receives steam from the locomotive-boiler through a pipe, O, and the steam escapes from the cylinder through a small orifice, P, at its lower side. This orifice remains constantly open, but is so small that it does not materially interfere with the action of the brakes when the steam is admitted to the cylinder; but it allows the escape of steam, when the pipe O is closed, with sufficient speed to release the brakes from the wheels as soon as required. The steam-pipe O has a cock or valve, which is operated by the engineer.

The relative position of the brake-block H and suspending-stud K is such that when the brakes are relieved from the steam-pressure their own weight and that of the links or hangers will carry them out of contact with the wheels. The movement of the brake-block, as suspended by the hangers or links from the pivot K as a center, causes them to approach the wheel in a line toward its center, or nearly tangential thereto, so that the strain upon the pedestals is small, as the line of pressure, if produced, would leave the pedestal at about the point of its attachment to the upper frame.

The orifice P may have a cock, worked automatically by the brake-block or other moving part, or by hand. The pipe O may be used to both admit and exhaust the steam by means of a suitable valve or cock.

The construction of my brake apparatus is such that it can be finished complete and ready for attachment to the locomotive-frame without any change being made in the same, except the drilling and tapping the holes for the screws at D.

I claim—

1. The combination of a double-ended cylinder, E, direct-acting pistons F, and piston-rods G, between the brake-blocks, with the brake-blocks H, hangers I, and pin K, fixed upon the common support plate or bracket C, substantially as set forth.

2. The combination of the two brake-blocks H, connected to the pistons by a pin, G, passing through a mortise in the piston-shell, and the inclined links or hangers I, supported on a pivot-stud on the bracket C, substantially as and for the purpose set forth.

3. The combination of supporting-plate or hanger C, hanging-links I, brake-block H, cylinder E, and pistons F, constructed and arranged for attachment to the frame of a locomotive, substantially as set forth.

4. The combination of brake-blocks H, double-ended cylinder E, attached to the lower end of bracket C, at its outer side, direct-acting pistons F, and regulating-screws M, as and for the purpose set forth.

5. The combination of brake-blocks H, with projections h', and suspension-links or hangers I, with screw-lugs i, and the adjusting-screws L, for the purpose set forth.

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Witnesses:
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GEO. H. KNIGHT.