2 Sheets—Sheet 1.

J. HICKEY.

Steam-Brake for Locomotives.

No. 203,454. **Patented May 7, 1878.**

FIG. 1.

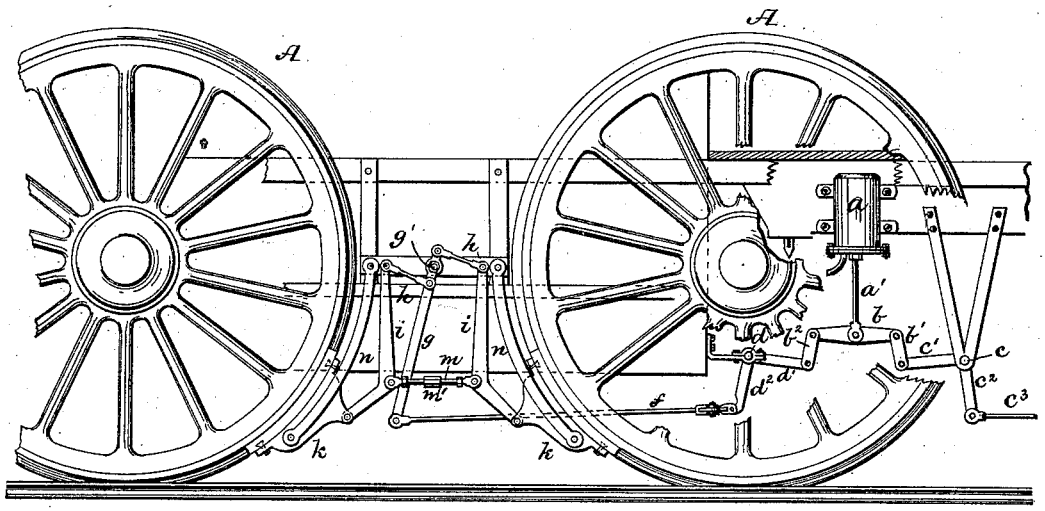
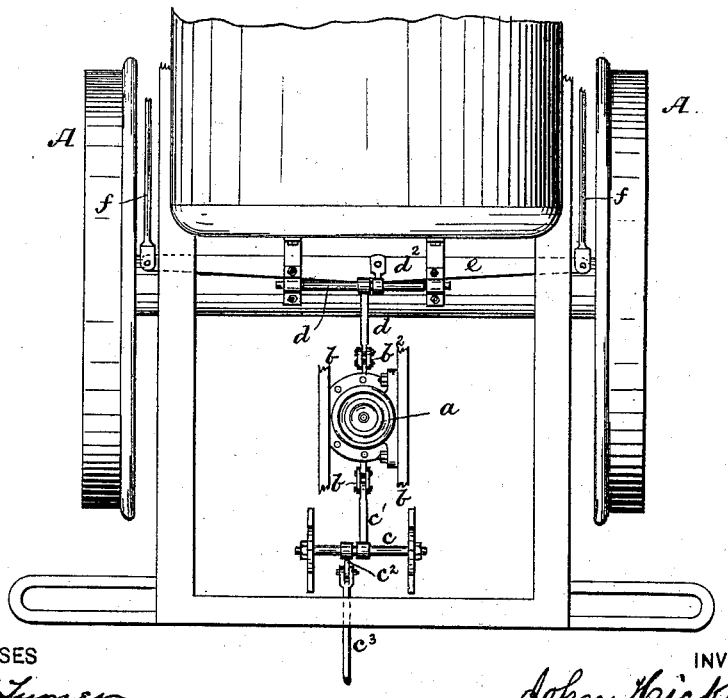


FIG. 2.



WITNESSES

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2 Sheets—Sheet 2.

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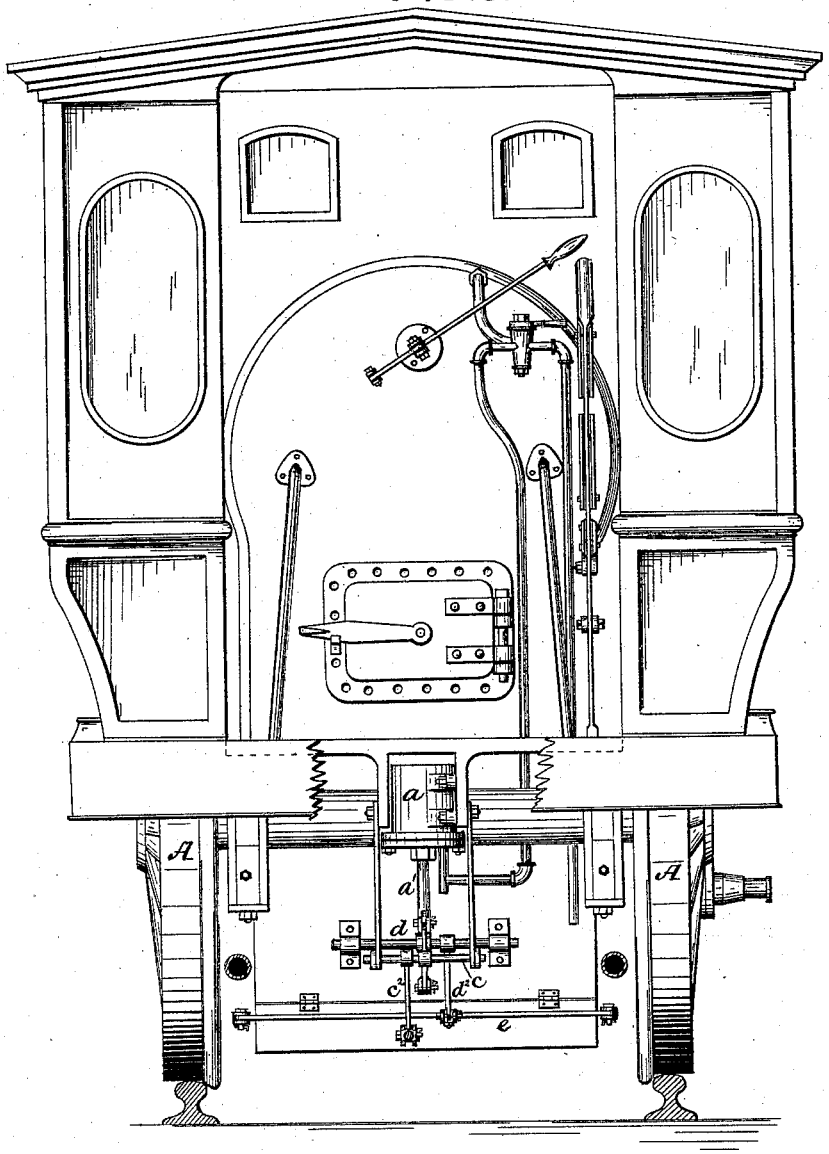
FIG. 3.



WITNESSES

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UNITED STATES PATENT OFFICE

JOHN HICKEY, OF SHEBOYGAN, WISCONSIN.

IMPROVEMENT IN STEAM-BRAKES FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **203,454**, dated May 7, 1878; application filed March 15, 1878.

To all whom it may concern:

Be it known that I, JOHN HICKEY, of Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented certain new and useful Improvements in Steam-Brakes for Locomotives; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

This invention has for its object to provide for locomotives a steam-brake operated by a single piston, and by which the brakes can be applied with equal force, and at the same instant, both to the driving-wheels and wheels of the tender.

It consists in a system or systems of expanding levers and equalizing-bars, arranged in combination with a single cylinder, and the brake-shoes of both the engine and tender, and in the manner of supporting and operating the brake-shoes of the engine driving-wheels, all of which will be hereinafter fully explained, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the driver-wheel and a portion of the engine-frame, showing my invention applied thereto. Fig. 2 is a plan or top view of a portion of the boiler and platform of an engine, showing the position of the cylinder by which my invention is operated; and Fig. 3 is a rear end view of the engine and cab, showing the manner of securing and engaging the system of levers.

a is the cylinder, which is secured in the position shown, so that the piston will have a vertical movement therein. It is secured centrally in the locomotive, and immediately below the foot-board, and behind the rear axle, and takes steam or compressed air at the bottom by a short pipe connecting with a suitably-constructed cock under the control of the engineer. The piston, with its rod a', is forced upward by the steam in the act of setting the brakes, and when the steam is cut off it drops by its own weight to the lower end of the cylinder.

b is an equalizing-bar, arranged longitudinally with the locomotive, and pivoted or secured at its center to the lower end of the piston-rod a', and its outer ends are connected, by links b^1 b^2, with rock-shafts *c d*, journaled in bearings secured to the locomotive, and on which are fixed the upper and under arms c^1 c^2 d^1 d^2.

To the end of the arm c^2 is attached the end of the rod c^3, which connects with and sets the brakes of the tender. To the end of the under arm d^2, on the rock-shaft *d*, is pivoted, at its center, the intermediate or transverse equalizing-bar *e*, to the outer ends of which are attached the rods *f f*, which extend forward and connect with the brake-levers arranged between the driver-wheels A A.

g is a lever pivoted to the end of the rod *f*, and extends upward between the driver-wheels, and is pivoted near its upper end on a pin, g', affixed on the engine-carriage.

Affixed to the lever *g*, immediately above and below the pivotal point g', are the arms or bars *h h*, which connect with the upper ends of the brake-levers *i i*. The lower ends of the brake-levers *i i* are connected by a suitable joint to the rear of the shoes *k k*. The levers *i* are bent near their lower ends, as shown, and are joined together by a fulcrum-rod, *m*, which is so constructed that it may be lengthened or shortened by means of a nut, m'. The rod *m* being connected to points intermediate between the ends of levers *i*, with the shoes *k k* on the lower ends of said levers *i*, as shown, permits greater freedom of the shoes, gives greater elasticity to the shoes, and causes the latter to act with greater promptness and effectiveness. The shoes are suspended on hangers *n n*, the upper ends of which are pivoted on pins on the carriage.

If steam or compressed air be let on, the piston will be driven to the upper end of the cylinder, the bar *b* will be raised, and equal force will be exerted on the rock-shafts *c d*, and equal pressure communicated through the latter to the brakes of both engine and tender.

The operation of the system of expanding levers which connect the brakes with the piston will be clearly understood by reference to the drawings. These levers, by means of the

equalizing-bars which distribute the pressure equally on the wheels, readily adjust themselves by expansion and compression to every irregularity of the track, allowing the engine, when the brakes are set, to have its proper movement on the springs, and so that the engine will ride with the same ease as when the brakes are off.

A drip-valve is provided for and inserted in the lower end of the cylinder.

In this device I have furnished a cheap and substantial steam-brake for locomotive-engines, one in which all of the numerous objections to such devices have been overcome. All springs for the operation of the piston in releasing the brakes are dispensed with.

Various changes may be made in the devices above described, and in their arrangement and combination. The small steam-cylinder, for instance, may be bolted to the fire-box, (where the space will admit) or at any other convenient point on the engine or tender.

The point of connection between the piston and longitudinal bar *b* can also be moved toward one end or the other of said bar, as the brake-pressure is desired to be greater on the engine-drivers than on the tender-wheels, or vice versa.

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

1. In a locomotive, the combination, with the single cylinder *a*, piston-rod *a'*, and rods *f* and c^3, and the brake-shoes of both engine and tender, of the intermediate systems of expanding levers and equalizing-bars, substantially as and for the purposes set forth.

2. In a locomotive, the combination, with the brakes of the engine and the cylinder *a* and piston-rod *a'*, of the equalizing-bar *b*, rock-shaft *c d*, equalizing-bar *e*, and rods *f*, all arranged and connected to operate substantially as set forth.

3. The combination, with cylinder *a* and the brake-shoes *k*, suspended on hangers *n*, of the levers *i i*, connected together intermediately between their ends by the fulcrum-rod *m*, arms *h h*, and lever *g*, all arranged as described, and connected by rods *f* and other suitable devices with the piston-rod, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN HICKEY.

Witnesses:
W. O. ST. SURE,
GEO. ST. SURE.