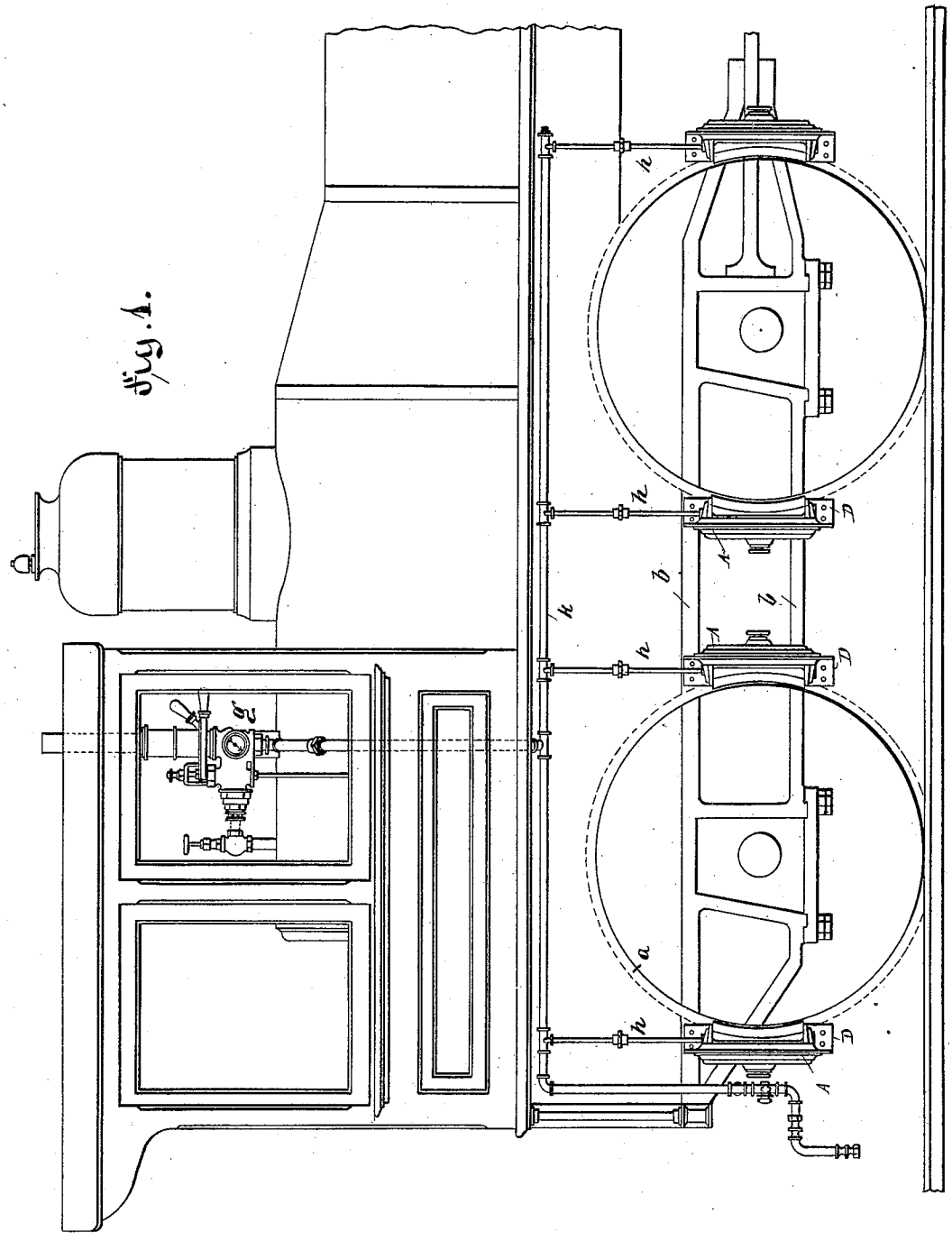
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L. P. LAWRENCE.

LOCOMOTIVE BRAKE.

No. 403,277. Patented May 14, 1889.

Fig. 1.



WITNESSES:

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Carl Kapp

INVENTOR

Louis P. Lawrence

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N. PETERS. Photo-Lithographer, Washington, D. C.

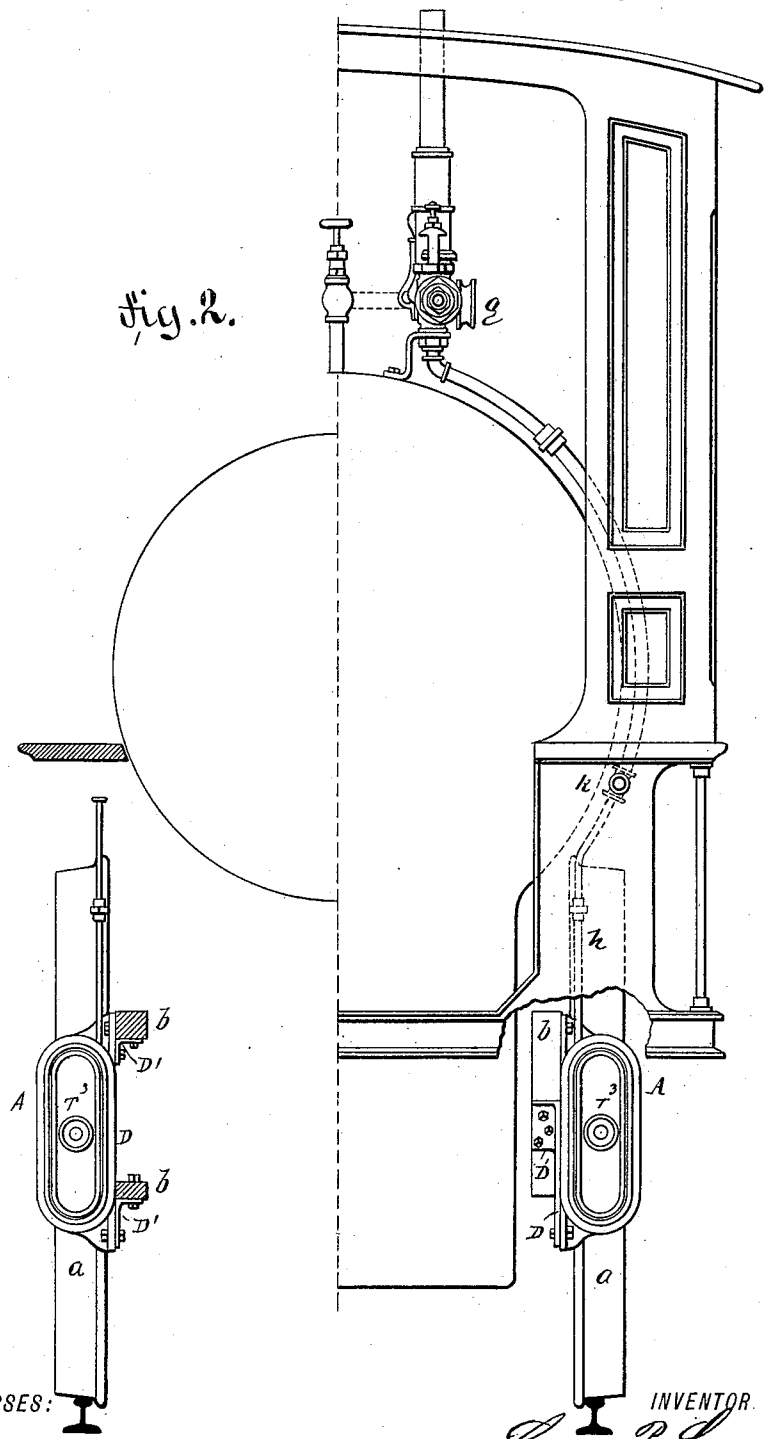
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LOCOMOTIVE BRAKE.

No. 403,277. Patented May 14, 1889.

Fig. 2.



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L. P. LAWRENCE.

LOCOMOTIVE BRAKE.

No. 403,277. Patented May 14, 1889.

Fig. 3

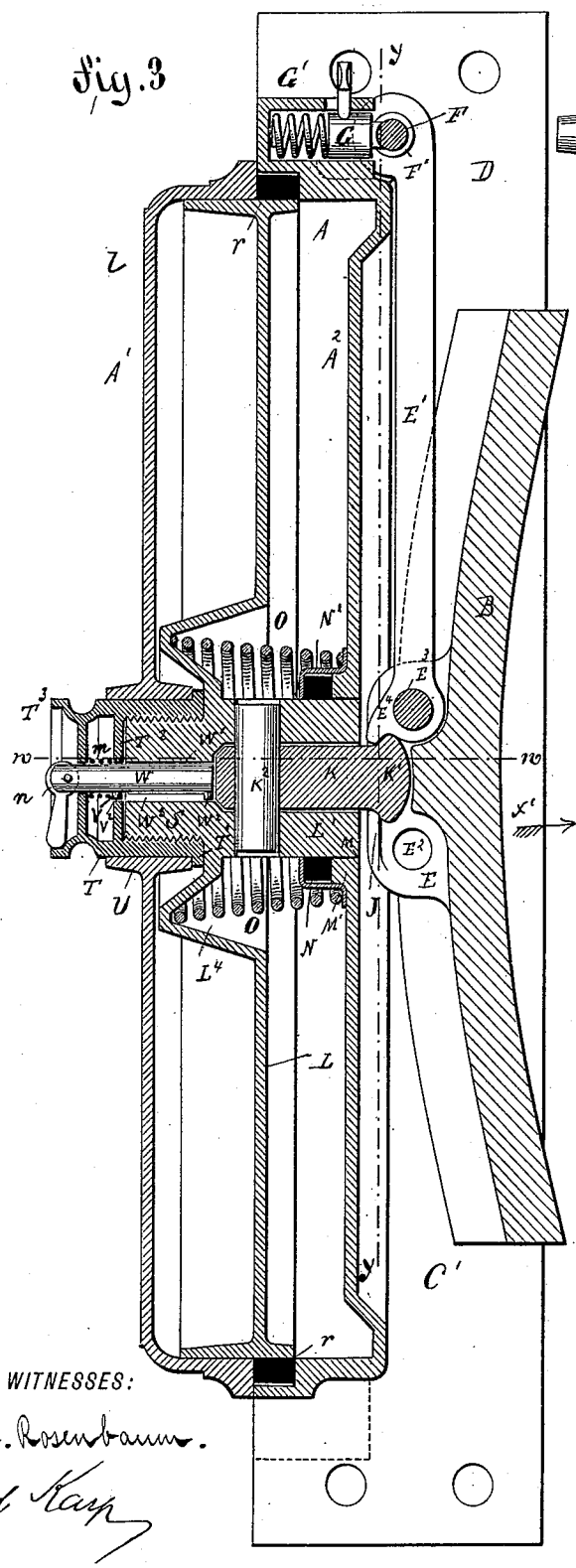
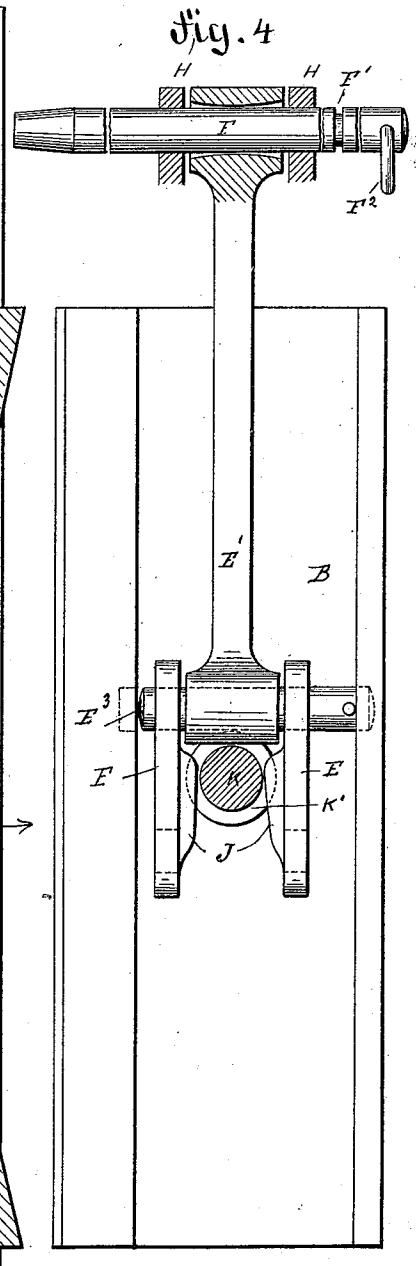


Fig. 4



WITNESSES:

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L. P. LAWRENCE.

LOCOMOTIVE BRAKE.

No. 403,277. Patented May 14, 1889.

Fig. 5

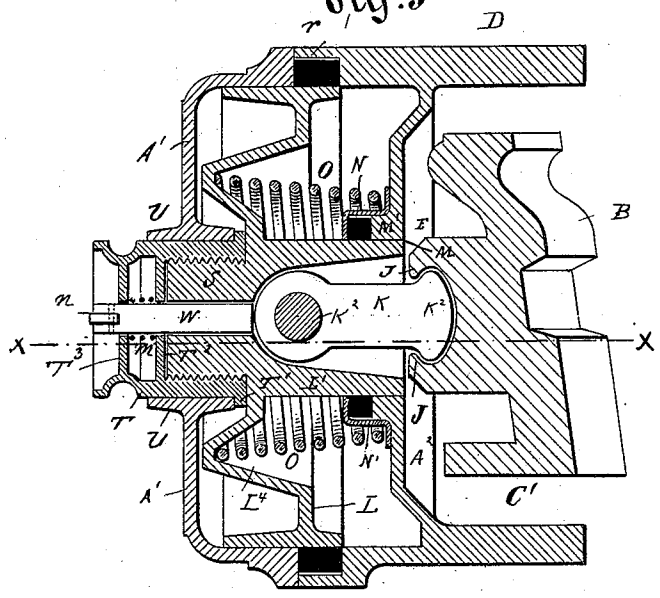
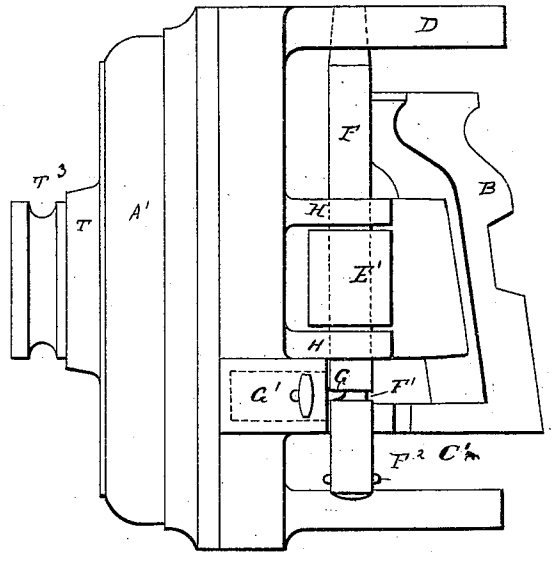


Fig. 6



WITNESSES:

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UNITED STATES PATENT OFFICE.

LOUIS P. LAWRENCE, OF PASSAIC, NEW JERSEY, ASSIGNOR TO THE LAWRENCE RAILWAY BRAKE COMPANY, OF NEW YORK, N. Y.

LOCOMOTIVE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 403,277, dated May 14, 1889.

Application filed November 22, 1888. Serial No. 291,536. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. LAWRENCE, of Passaic, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Locomotive-Brakes, of which the following is a specification.

This invention relates to that class of brakes that are operated by vacuum or by compressed air, steam, or any other like medium under pressure.

The object of my invention is to provide a brake of this kind which is simple in construction and effective and reliable in use.

The invention consists in the combination of parts and details, as will be fully described and set forth hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of a locomotive provided with my improved brake, parts being broken out. Fig. 2 is a rear end view of the same, parts being in section and others omitted. Fig. 3 is a vertical longitudinal sectional view of brake-shoe, saddle, and cylinder on the line *x x*, Fig. 5. Fig. 4 is a vertical transverse sectional view of the same on the line *y y*, Fig. 3. Fig. 5 is a horizontal sectional view on the line *w w*, Fig. 3. Fig. 6 is a top view of the parts shown in Figs. 3, 4, and 5.

Similar letters of reference indicate corresponding parts.

The cylinder A for operating the brake-shoe B is made in the shape of a flattened ellipse—that is, the sides are parallel and the ends are rounded off, as shown in Fig. 2, but, if desired, may be at right angles to the sides. The cylinder is flattened, so that its longitudinal central vertical plane will be about in line with the vertical longitudinal central plane of the wheel, and the width of the cylinder will be about equal to the width of the rim of the wheel. Said cylinder is cast integral with the saddle or plate D, from the outer face of which it projects, said saddle forming one of the sides of the cylinder. That head A^2 of the cylinder facing the rim of the wheel *a* is cast integral with the cylinder, and the other or outer head, A′, is removable and is bolted on the cylinder. The saddle or plate D is riveted or bolted to angle-pieces D′, which in turn are riveted or bolted to the frame *b* of the locomotive, so as to be adjacent to the rims of the wheels *a*. The cylinder A has a wing, C, at the outer side, forming with the saddle or plate D and the head A^2 a pocket, C′, for receiving the brake-shoe.

The brake-shoe B is provided on its rear surface with two lugs, E, at the middle of its height, and between said lugs one end of a link, E′, is pivoted by a pin, E^3, passed through holes E^2 in said lugs. The upper end of the link is mounted to swing on a pin, F, passed through an opening in the saddle D and through two lugs, H, on the upper end of the cylinder, the upper end of the link E′ being between said lugs. A spring-latch, G, contained in a casing or box, G′, on the top of the cylinder enters the annular groove F′ in the pin F and prevents said pin from moving in the direction of its length. Said pin has a handle-ring, F^2, at one end. The lugs E have holes E^2 at both ends, so as to permit of reversing the shoe.

The lower end of the link E′ is provided with a lip, E^4, for a purpose that will be set forth hereinafter. The lugs E are provided with flanges J, projecting toward each other and forming a pocket for receiving the head or enlargement K′ on the front end of a link, K, pivoted to swing laterally by a pin, K^2, at the inner end of a slightly-flaring bore of a projection, L′, at the center of the piston L, fitting and working in the cylinder A. The lip E^4 of the link E′ engages the head K′, as shown in Fig. 3.

The projection L′, which has a uniform exterior diameter or dimensions, passes through a corresponding aperture, M, in the fixed head A^2 of the cylinder. Said head is provided on its inner surface with an annular flange, M′, along the edge of the aperture M, and on the same a packing-ring, N, is placed, which is held in place by the ring N′, having an internal flange on one edge and an external flange on the other edge.

A spiral spring, O, surrounding the tubular projection L′ has one end rested against the closed end of a pocket, L^4, in the piston L and the other end on the exterior flange of the ring N′, and thus serves to hold said ring

and the packing N in place. The piston L is provided with a threaded stem, S, which is screwed into a tubular nut, T, mounted to turn in the neck U, projecting from the inner and outer surfaces of the head A′, said nut T being provided at its inner end with an exterior flange, T′, which rests against the inner end of the neck U.

The nut T is provided near its outer end with a partition, T^2, and with a recessed head, T^3, on its end. A sliding bolt, W, projects through the bottom of the recessed head T^3, the partition T^2, and into a corresponding bore, W′, in the stem S. A lug, W^2, projects from the bolt W into the longitudinal groove W^3 in the bore W′ to prevent the bolt from turning in the stem S. The bolt W is provided with a projection, V, which can pass into a notch or recess, V^2, in the partition T^2 and in line with the groove W^3. A spiral spring, *m*, surrounding the bolt W bears on the projection V and keeps the same in the recess V^2. The outer end of the bolt W is pivoted to an eccentric-lever, *n*, resting on the bottom or inner end of the head T^3.

The packing *r* is placed in an annular recess in the inner surface of the cylinder and is held in place by the head A′. Each cylinder A is connected by a pipe, *h*, with the pipe *k*, which in turn is connected with the ejector *g*, and each head A′ is provided with an aperture, *l*.

The operation is as follows: When the brake is to be applied, the air is exhausted by the ejector from that part of the cylinder between the piston L and the cylinder-head A^2, when the exterior air, acting on the piston L, presses the same in the direction of the arrow *x*′. The link K, acting on the shoe, presses the same against the rim of the wheel. The wheels give sidewise, and when the brake-shoes are applied they move laterally with the wheels. As the shoes are suspended by the links E′ from the pins F, such movement is possible. As the bore of the projection L′ is made flaring, the link can swing in the same as the shoe moves laterally. There is thus no danger of undue strains on the locomotive-frame by the lateral movements of the shoes with the wheels. When the vacuum is destroyed, the compressed spring O expands and presses the piston in the inverse direction of the arrow *x*′, and the head K′ of the link K, acting on the flanges J of the lugs E, draws the shoe from the rim of the wheel. As the shoe wears off the slack must be taken up; and this is done in the following manner: The cam-lever *n* is turned so as to pull outward the bolt W sufficiently to remove the projection V from the notch or recess V^2 in the partition T^2, thus permitting of turning the nut. This nut cannot move in the direction of its length, and therefore moves the stem S and the piston L, with which it is made integral, a short distance toward the rim of the wheel—that is, sufficiently to take up the slack caused by the wearing of the shoe. After the parts have thus been adjusted, the cam-lever *n* is swung back and then the spring *m* presses the projection V into the notch V^2 in the partition T^2, thus preventing the nut T from turning. The bolt W is prevented from turning in the stem S by the projection W^2 in the groove W^3.

The centers of the shoes are about at the horizontal central lines of the wheels, and thus there is no danger of derailment in case the brakes are released suddenly at a time when the wheels are not true on the rails. By making the actuating or operating device for each shoe separate and independent of the other shoes I am enabled to arrange the shoes in this manner.

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

1. The combination, with a locomotive-frame, of a cylinder projecting laterally from said frame adjacent to the rim of the wheels, the open end of said cylinder facing the rim of the wheel, and the said cylinder being flattened to have approximately the width of the wheel-rim, the long axis of said cylinder being parallel with one of the diameters of the wheel, a piston in said cylinder, and a brake-shoe connected with said piston and located between said piston and the rim of the wheel, substantially as set forth.

2. The combination, with a locomotive-frame, of a cylinder projecting laterally from the same, the open end of said cylinder facing the rim of the wheel, a piston in said cylinder, a brake-shoe operated by said piston and located between the piston and the rim of the wheel, and a link pivoted to the brake-shoe and to the top of the cylinder containing the piston that operates the shoe, substantially as set forth.

3. The combination, with a cylinder, of a piston in the same provided with a screw-threaded stem, and a cylindrical nut screwed on the stem and mounted to slide in an aperture in one head of the cylinder, substantially as set forth.

4. The combination, with a cylinder, of a piston having a screw-threaded stem, a cylindrical nut screwed on said stem and mounted to slide in an aperture in one head of the cylinder, and a bolt for locking the nut on said stem, substantially as set forth.

5. The combination, with the cylinder A, of the piston L, having the projection L′, the link K, pivoted in the bore of said projection L′, and having the head K′ on its outer end, and the brake-shoe B, having the flanged lugs E, substantially as set forth.

6. The combination, with the cylinder A, of the piston L, having the projection L′, the brake-shoe B, the spring O, the packing N, and the flanged ring N′, substantially as set forth.

7. The combination, with a cylinder projecting from a plate and having a wing on that side of the cylinder opposite the one connected with the plate, of a brake-shoe between said plate and wing, and a piston in the cylinder connected with the brake-shoe, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

LOUIS P. LAWRENCE.

Witnesses:
CARL KARP,
JOHN A. STRALEY.