C. W. LANPHER.

Brake for Locomotive-Engines.

No. 217,882. Patented July 29, 1879.

Fig 1.

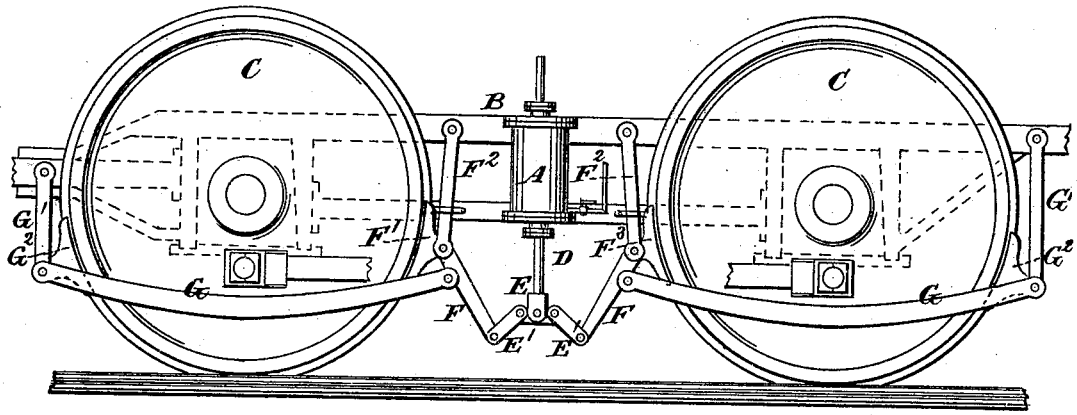


Fig 2.

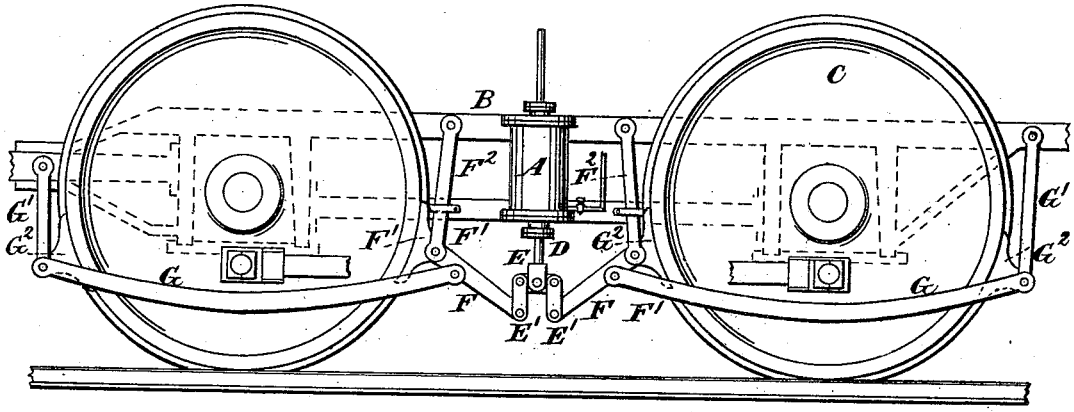


Fig 3.

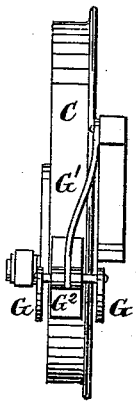
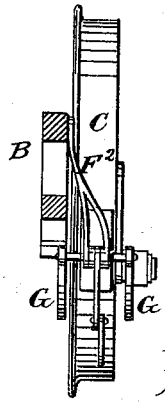


Fig 4.



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UNITED STATES PATENT OFFICE.

CHARLES W. LANPHER, OF NORWICH, NEW YORK.

IMPROVEMENT IN BRAKES FOR LOCOMOTIVE-ENGINES.

Specification forming part of Letters Patent No. 217,882, dated July 29, 1879; application filed June 12, 1879.

To all whom it may concern:

Be it known that I, CHARLES W. LANPHER, of Norwich, in the county of Chenango and State of New York, have invented certain new and useful Improvements in Brakes for Locomotive-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is an elevation of so much of a locomotive as is necessary to show the application thereto of my improved brake, it showing the driving-wheels, a portion of the frame, a cylinder for forcing the brake-shoes upon the wheels, hangers and rods for supporting and applying them, and a piston-rod for connecting them to the operating-piston. In this figure the parts are shown in the position which they assume when not in operation. Fig. 2 is a similar view, showing the same parts in position to apply the retarding-force to the wheels. Fig. 3 is a view showing the method of suspending the outer brake-shoes and the position they occupy with reference to the centers of the driving-wheels, and Fig. 4 is a view showing the method of suspending the shoes between the wheels.

Corresponding letters denote like parts in all of the figures.

This invention relates to brakes for locomotives and other forms of rolling-stock of railroads, it being designed as an improvement upon that type of brakes which use a steam or other cylinder, located between the wheels, for applying the brake-shoes upon the peripheries thereof; and it consists in the combination of certain devices for applying the retarding-force in such a manner that it shall not cause the journals of the axles to wear oblong apertures in their bearings, as will be more fully explained hereinafter.

The usual method of applying brake-shoes to wheels is to place them upon the outer or inner surfaces only of the wheels, and then to force them toward or away from each other, the effect of which is to cause the journals to be pressed hard against the sides of their bearings, and thus cause them to be worn oblong in form, and allow said journals, when the brakes are not applied, to be loose in their bearings, one of the injurious effects of which is, that the axles are allowed to depart, in running, from a line at a right angle to the rails or frame of the engine, and thus cause additional wear of the flanges of the wheels and bring undue strain upon the side rods and crank-pins, as well as a largely-increased amount of friction.

The object of this improvement is to obviate the above-recited difficulties by providing shoes to be placed upon both the front and rear surfaces of the wheels, whereby the retarding-force is applied upon both sides thereof and below the center of the wheels, and consequently the journals are forced to the upper portions of the bearings, which effectually prevents the wearing of them into an oblong form.

In practically applying my improvement to a locomotive there is a cylinder, A, attached to the frame B at a point midway between the driving-wheels C, which cylinder has, by preference, a piston-rod extending through its lower head, but which may extend through both the upper and lower heads. To the piston-rod there is secured a piston, which, when the parts are in the position shown in Fig. 1 of the drawings, is near the lower end of the cylinder, so that when the propelling-force—which may consist of steam taken from the generator or of air forced in by a pump—is applied it will be moved upward, and thus act, through a system of levers and rods soon to be described, in applying the brake-shoes to the sides of the wheels. This cylinder has upon both of its ends tightly-packed heads, and hence, when the piston is at or near the lower end thereof, that portion which is above the piston is filled with air, which, when it is forced upward for the purpose of applying the brakes, is compressed, and thus made to act as a spring for instantly releasing the brakes when the pressure is removed from below said piston. To the lower end of the piston-rod D there is affixed a cross-head, E, which may be adjustable on said rod, so that the position of the brake-shoes may be regulated thereby, to the ends of which links

E′ are pivoted, their outer ends being connected to levers F, the inner ends of which are attached to brake-shoes F^1 and to hangers F^2, the latter being for the purpose of suspending the former from the frame of the engine and giving free motion in applying and releasing the brake-shoes.

For the purpose of operating the shoes G^2, which bear upon the outer sides of the wheels, connecting-rods G are attached to the levers F between their points of suspension and of connection with the links E′, from which point they extend to and are connected with hangers G^1, the upper ends of which are pivoted to the frame B of the engine.

The connecting-rods G are placed outside and inside of the wheels, and are so arranged with reference to the levers F that as the ends of the latter are carried upward by the movement of the piston in the cylinder A, the shoes F^1 and G^2 will be simultaneously applied to the opposite sides of these wheels, or upon opposite parts of the peripheries thereof. This application and arrangement of the rods G G upon both sides of the wheels is regarded as an important feature of my invention, as it prevents the brake-shoes from inclining to slip outward upon the wheels, as they are sure to do when only one connecting-rod is used, owing to the fact that the wheels are turned conical or tapering.

It will be found most convenient to use steam as a motive force in the cylinder; but I do not confine myself to its use, as it is evident that compressed air or other forms of gas may be used with good effect, or water from the generator may be employed; but whatever the character of the agent, its admission to and eduction from the cylinder may be regulated by any of the well-known devices for such purposes, the operating parts thereof being placed in such a position as to be readily operated by the engineer or fireman.

I have thus far spoken of my improvement as applicable only to a locomotive; but it is evident that the same combination of devices is applicable to tenders and to cars, the only requisite being some means of conveying the steam or other agent to the cylinder, and the addition of the requisite means for operating the induction and eduction valves.

I am aware that it is not novel, broadly, to place a cylinder between the wheels of a locomotive or other railroad-vehicle for the purpose of applying the retarding-force to the wheels; and I am also aware that it is not novel to apply brake-shoes to both the front and rear surfaces of such wheels at points opposite their centers, such an arrangement being shown in English Patent No. 2,231 of 1872 to P. Renshaw; but this differs from mine in that he uses an open-ended cylinder, and for the motive force the pressure of the atmosphere. He also places his brake-shoes opposite or on a line with the centers of the axles, so that the requisite upward pressure is not put upon the journals; and, further, he does not provide a double connecting-rod for connecting the front and rear brake-shoes, the effect of which omission is, that they have a constant tendency to slip off from the tread of the wheels, they being tapering or conical in form.

In all of these respects the device alluded to differs from mine, in which the brake-shoes are so placed as, when in operation, to give an upward pressure upon the journals, and thus prevent them from wearing oblong apertures in their boxes, thus insuring an equal strain upon the side rods of a locomotive at all times.

My device also differs from the one referred to in that there is provided in it a double connecting-rod for connecting the front and rear brake-shoes, one portion of such rods passing along the outside of the wheels, and the other along the inner side, the inner one effectually preventing the shoes from slipping off from the treads of the wheels when in use.

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

In combination with the steam-generator of a locomotive-engine, the herein-described braking or retarding mechanism, it consisting of a cylinder, A, closed at both of its ends, an adjustable cross-head, E, attached to the end of the piston-rod of said cylinder, links E′, levers F, for applying the brake-shoes to the wheels, double connecting-rods G G, for operating the shoes upon the outer portions of the wheels, hangers for supporting the parts in position, and brake-shoes for application upon opposite parts of the wheels and below the centers thereof, the parts being arranged for joint operation, substantially as described.

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

CHARLES W. LANPHER.

Witnesses:
JOHN W. CHURCH,
W. W. BROWN.