

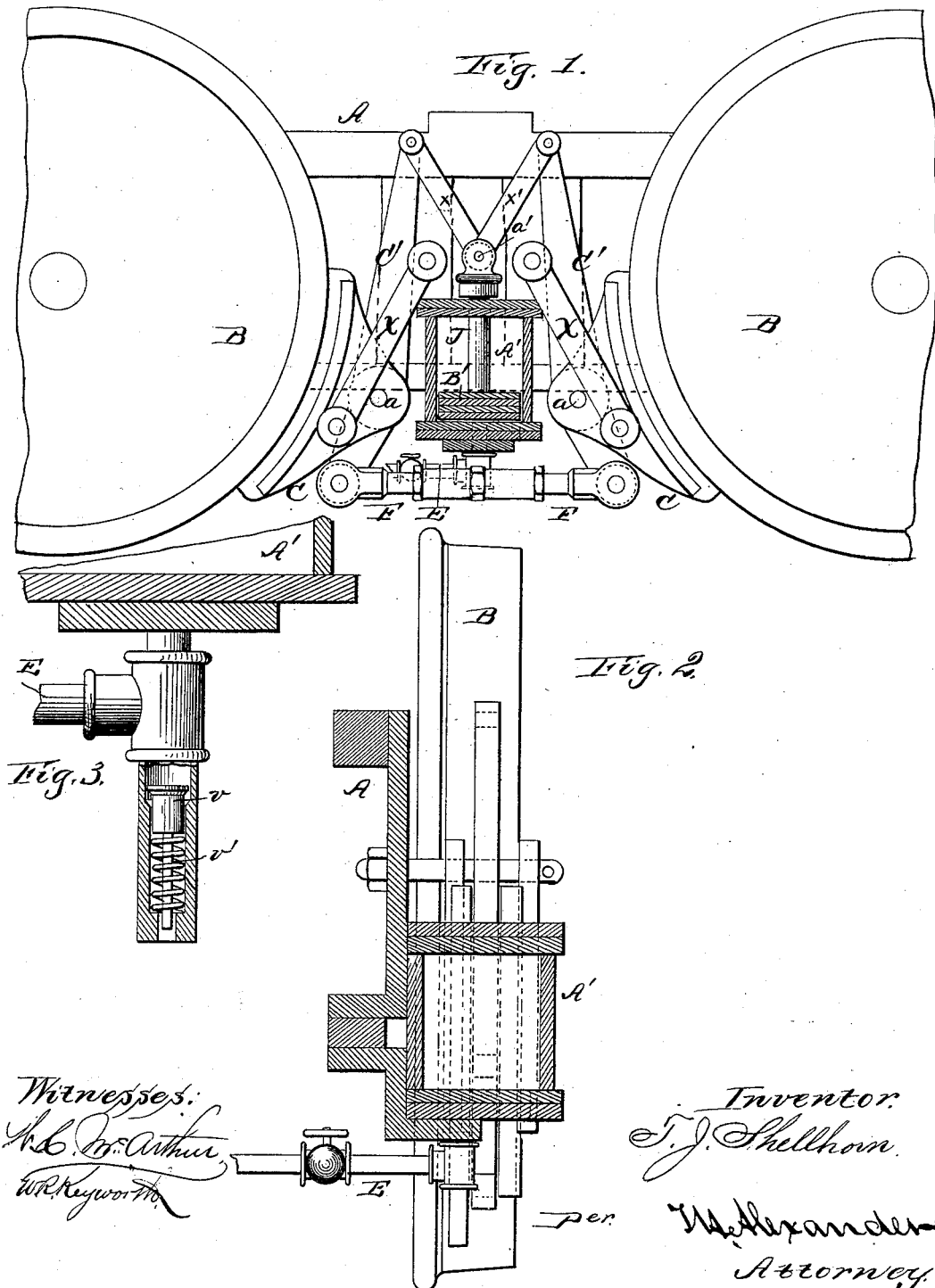
(No Model.)

T. J. SHELLHORN.

STEAM BRAKE.

No. 265,879.

Patented Oct. 10, 1882.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS J. SHELLHORN, OF HANCOCK, MICHIGAN.

STEAM-BRAKE.

SPECIFICATION forming part of Letters Patent No. 265,879, dated October 10, 1882.

Application filed February 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. SHELLHORN, of Hancock, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Steam-Brakes; and I 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, which form part of this specification, in which—

Figure 1 is a side elevation, partly in section. Fig. 2 is a vertical section through the steam-cylinder. Fig. 3 is a vertical section of the exhaust-valve.

This invention relates to improvements which I have made on the locomotive and car brakes for which Letters Patent of the United States were granted to me bearing date September 5, 1876, and numbered 181,869.

My present invention has especial reference to a vertical cylinder which will admit steam or other elastic fluid through its bottom by means of a pipe properly provided for the purpose, whereby the pressure will be from below upward, thus obviating the necessity of a stuffing-box or gland for the piston-rod, and thereby avoid the friction due to a tight stuffing-box in relieving the brake. I also provide at the bottom or lower head of the said vertical cylinder means for the free escape of the waste steam and water of condensation; and I furthermore employ a certain novel combination of levers with brake-shoes and said cylinder and a piston therein actuated by a force from beneath of it, whereby I impart such compensating motion that the strain transmitted by the drive-wheels through inequalities in the track is transferred to the piston and cushioned by the steam, in lieu of being thrown upon the hangers.

I will show by the following description, when taken in connection with the annexed drawings, that the entire weight of the brake mechanism is borne by the steam or other elastic force acting upward against the piston.

A designates the frame of a locomotive, and B B the drive-wheels on one side thereof.

C C are two brake-heads, which are provided in the usual or most improved manner with brake-shoes adapted to press against the pe-

ripheries or treads of their respective wheels. The brake-heads C C are connected at *a a* to fulcrum-pins of levers C' C', the shortest arms of which are pivoted to a fulcrum-rod, F, which is extensible by means of a nut, for the purpose of compensating for the wear of the brake-shoes. The longest arms of the levers C' C' are connected by links to a pin, *a'*, which passes transversely through ears formed on the upper end of a piston-rod, J. This piston-rod passes freely through the head of a cylinder, A', which is suitably sustained in a vertical position located below the axis of the wheels by the frame A of the locomotive. The vertical axis of this cylinder is equidistant from vertical planes intersecting the axes of the drive-wheels B B.

The piston B', which is suitably fixed to the piston-rod J, is fitted with steam-packing-rings, thus obviating the necessity of using a stuffing-box or gland for the piston-rod J, where it passes through the head or top of the cylinder.

Steam is admitted to the cylinder A at its lower end through a pipe, E, leading from the steam-space of the boiler, and which is provided with a suitable cut-off, which is under the control of the engineer in his cab. There is also provided a drip-valve or steam-outlet, located beneath the piston B', which has an automatic valve, *v*, that is opened by a spring, *v'*, under the valve. When the steam is applied to the brake the pressure of steam closes the valve, and when the steam is let off the spring opens the valve and holds it open until the steam is again applied to the brake.

The brake-heads are suspended by hangers *x x*, and the upper ends of the levers C' C' are connected by links or toggles *x' x'* directly to the upper end of the piston-rod J, as shown in Fig. 1. This form of toggle has special value for my purpose, as the motion of the piston is more rapid at the time when the toggle-bars are starting from the point of their greatest flexion, and as they straighten out the power increases, and rate diminishes as the point of ultimate pressure on the brake-heads is approached.

The operation of the brakes on each side of the locomotive is as follows: Steam is admitted beneath the piston, which forces it upward. The piston-rod operates through the two links *x' x'* to spread apart the two levers *c'* and to

press the brake-shoes with more or less force against the treads of the wheels. To release the brakes, steam is allowed to escape from the lower head of the cylinder A'.

- 5 It will be seen that by the above-described combination of levers the entire weight of the brake mechanism is carried by the piston supported by the steam, by means of which rigidity and concussion are avoided and elasticity afforded. The release of the brakes is effected when steam is shut off by the combined weight of the levers, the fulcrum-rod, the brake-heads, and the shoes thereof, the gravity of which will cause the piston to descend until it rests upon the bottom head of the cylinder A'. The brake-shoes will thus be moved free from the treads of the wheels, and when they are not in immediate action thereon they will not be subjected to wear. It is obvious that the mechanism hereinabove described as applicable to locomotives for the purpose of braking the drivers thereof is equally applicable to the trucks of cars.

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

1. The combination of the suspended brake-heads C C, the hangers *xx* therefor, the vertical levers C' C', pivoted thereto, the endwise-adjustable fulcrum rod F, pivoted to the lower

arms of the levers C' C', the toggle-links *x' x'*, connecting the upper ends of the said levers directly to the piston-rod, and the vertical steam-cylinder located below the axis of the wheels, all arranged for joint operation substantially in the manner and for the purposes described.

2. The combination of the suspended brake-heads, the hangers therefor, the vertical levers pivoted to these heads, the adjustable fulcrum-rod, the toggle-links connecting the upper ends of said levers directly to the piston-rod, the vertical steam-cylinder, the steam inlet and outlet pipes, and the spring-actuated valve *v*, connected to the supply-pipe, all arranged substantially in the manner and for the purposes explained.

3. In a power-brake system, a vertical cylinder having a steam-tight piston and glandless heads, said cylinder being adapted to take steam from the lower end and exhaust it from the same end, in combination with a relief-valve connected to the steam-pipe, all constructed and arranged substantially as described.

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

THOMAS J. SHELLHORN.

Witnesses:

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R. H. BRELSFORD.