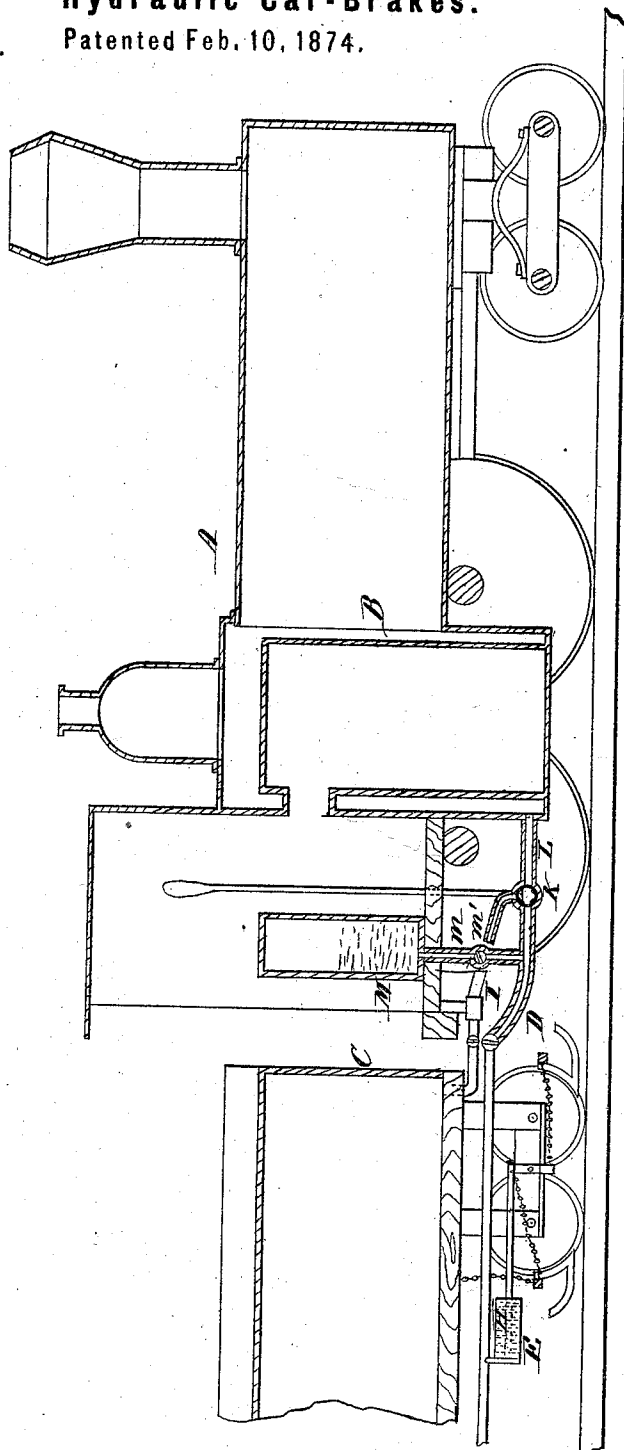


T. McBRIDE.
Hydraulic Car-Brakes.

No. 147,338.

Patented Feb. 10, 1874.



Witnesses
J. Bonnelly
Harry Coleman.

Inventor
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 Attorneys.

UNITED STATES PATENT OFFICE.

THOMAS McBRIDE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN HYDRAULIC CAR-BRAKES.

Specification forming part of Letters Patent No. **147,338**, dated February 10, 1874; application filed October 13, 1873.

To all whom it may concern:

Be it known that I, THOMAS McBRIDE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Car-Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which the figure shown is a representation of a vertical longitudinal section of my invention.

This invention has relation to hydraulic car-brakes; and consists in the combination, with the conveying-pipes leading from the water-tank or tender and locomotive-boiler, of a glycerine tank or reservoir, having communication with the pipe leading from the boiler by means of a tube provided with a suitable valve, all as and for the purpose hereinafter described.

Referring to the accompanying drawing, A is a locomotive, of which B is the boiler, and C a tender. D is the conveying-tube, passing from the boiler to and beneath the tender and cars, having suitable devices for coupling and uncoupling, and so arranged that the contents of the tube will be held in place whether the sections be united or apart. E represents one of the cylinders through which hydraulic pressure is exerted to operate the brakes, said cylinders being provided with pistons, as shown, so connected to the brakes that as the pistons are forced out the brakes are applied to the wheels. A spring, H, is employed to retract the brake and piston after the hydraulic pressure is withdrawn. I represents a tube leading from the water-tank in the tender to the tube D, a three-way valve, K, being located at the junction of said tubes, from which leads to the boiler below the water-line a pipe, L.

The operation is as follows: The valve K is first opened in such manner as to allow the water from the tender to enter and fill the tube D, passing thereto through the pipe I,

and kept in this position until it is desired to apply pressure. The valve K is then turned, cutting off communication with the tender, and opening it with the boiler, whereupon the boiler pressure is at once brought to bear upon the water in the tube, forcing the pistons out and applying the brakes to the wheels.

The object of my invention being to avoid the danger of the water freezing in the tube D in cold weather, I provide the following arrangement of devices: A tank, M, containing glycerine or other non-freezing liquid, is provided and placed in communication with the tube D by means of a pipe, *m*, having a check-valve, *m'*. To apply the glycerine to the operation of the brakes, the check-valve *m'* is opened and the liquid allowed to flow from the tank into the tube D until the latter is filled all the way from the three-way cock to the brake-pistons. The three-way cock is now turned, opening communication with the boiler. Pressure is obtained which at once closes check-valve *m'*, preventing flow of glycerine from tank. The column of glycerine in tube D is moved along in the direction of the cylinders under cars by pressure from boiler, so that the end of said column adjacent to cock K will travel as far, say, as the tube *m*. The vacuum which will be formed between the latter and the three-way cock will be filled by the water rushing through said cock. When the pressure is relaxed, by turning cock K, the water in tube D from, say, the cock K to the pipe *m* will pass up the pipe I, leading to tender, and the glycerine column will assume its original position. Thus there will be no glycerine returned to the boiler or tender, for the water and glycerine will not be mixed in the tube D. The glycerine simply moves to and fro, and the water that enters tube D from boiler is pushed into tender on the return motion of the glycerine column.

I herein disclaim the pipes I, L, and D, and the three-way valve K, combined as shown, the same having been described and claimed in an application filed by me July 2, 1873, now pending.

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

The combination, with the conveying-tube D and pipes I and L, the latter communicating with the boiler B in order to obtain hydraulic pressure, as set forth, of the glycerine tank or reservoir M, having communication

with said pipe L by means of the pipe *m* and valve *m'*, as shown and set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of September, 1873.

Witnesses: THOMAS McBRIDE.

M. DANL. CONNOLLY,

EUGENE P. EADSON.