

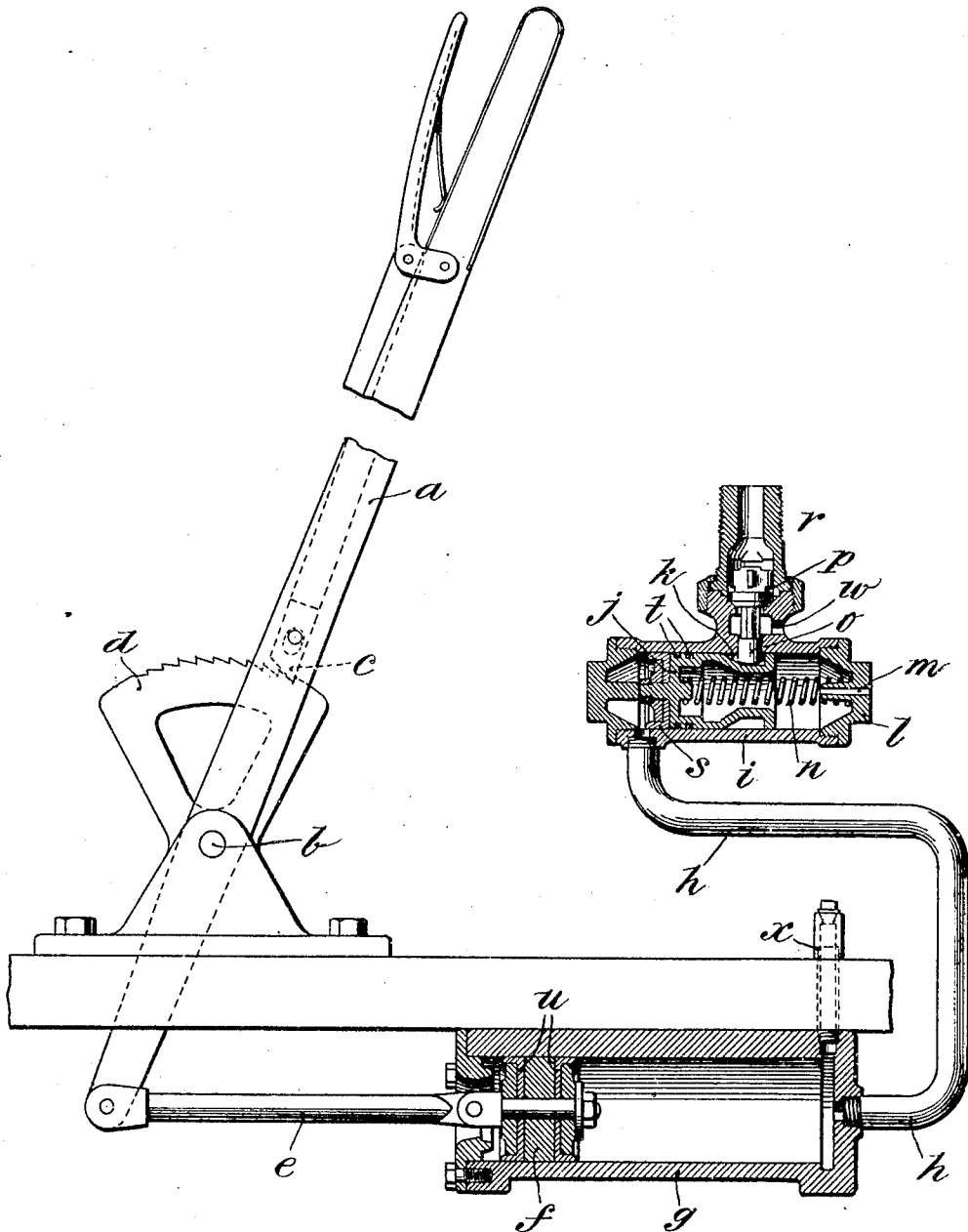
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W. J. McCARROLL.

MEANS FOR HYDRAULICALLY OPERATING VALVES AND COCKS.

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MEANS FOR HYDRAULICALLY OPERATING VALVES AND COCKS.

No. 856,981.

Specification of Letters Patent.

Patented June 11, 1907.

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To all whom it may concern:

Be it known that I, WILLIAM J. McCARROLL, a citizen of the United States, and a resident of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Means for Hydraulically Operating Valves or Cocks, of which the following is a specification.

My invention relates to improvements in means for hydraulically operating valves or cocks, and more particularly to improvements in means for operating the drain cocks of locomotive cylinders.

Heretofore the drain cocks of locomotive cylinders have been operated either through a system of levers and rods operated from the cab of the engine, or by means of steam or air conducted through pipe to a cock operating means placed below the cylinders and controlled through a suitable valve in or near the cab. The first of these methods is objectionable owing, firstly, to the power required to move the several rods and levers; secondly, because of the wear upon the several joints of the apparatus; and thirdly, because of the difficulty of getting them in alinement when more than two cocks are operated by the same lever. The second method is objectionable in that two air or steam conduits are necessary for its successful operation and in that it is inoperative from the cab in the absence of air pressure in the boiler or air tanks.

In my invention I place in or near the cab of the engine an hydraulic cylinder which I furnish with a piston, the rod of which is connected with a lever easily reached by the engineer. The hydraulic cylinder is filled with a liquid, in a cold climate preferably an oil or a non-freezing liquid, and the front of the cylinder communicates with a pipe, also filled with the liquid, which leads to cylinders one under each drain cock of the locomotive cylinder. The cylinders to which the pipe from the first cylinder lead, are furnished with a piston the forward end of which has a cam like form against which rests a stem which engages, or is connected to, a valve which is seated in a nipple or conduit, which is placed at right angles to the line of travel of the latter piston and which is connected with the

cylinder to be drained, this valve forming the drain cock of the cylinder.

To open the drain cocks the piston in the hydraulic cylinder is moved forward driving the liquid from this cylinder through the connecting pipe to the second cylinder and causing the piston therein to move forward, the inclined part, or cam, of which will now pass under and lift the rod or stem which is connected with the drain cock or valve. As soon as this valve is lifted any water that may be in the end of the locomotive cylinder to which said cock is connected can pass down through the valve and escape.

To close the valve the first piston is drawn back sucking the liquid in its cylinder in the connecting pipe, and in the second cylinder, after it and returning the piston in the second cylinder and the drain valve to their first position.

In the accompanying drawings a diagrammatic view of my invention is shown.

a is an operating lever pivoted at *b* and carrying a detent *c* adapted to engage with a notched segment *d* in a usual and well known manner. To the lower end of the lever *a* is pivotally secured one end of a rod *e* the other end of which is secured to a piston *f* carried in a cylinder *g*.

To the forward end of the cylinder *g* is connected a pipe *h* which leads to one end of a cylinder *i* which carries a piston *j* the forward end of which is prolonged and formed with a cam face *k*. The forward end of the cylinder *i* is closed by a plug *l*, which is furnished with a perforation *m*.

n is a spring one end bearing against the forward end of piston *j* and the other against the inner end of plug *l*.

o is a stem or rod placed at right angles to the cylinder *i* and forming part of or engaging a valve *p* which is seated in a part of the cylinder casting *i*. *r* is a nipple or pipe the upper end of which is adapted to be screwed into the lower side and at one end of a locomotive cylinder, not shown, and the other end of which is adapted to be secured in any suitable manner to the cylinder casting *i*, by a union as shown for instance.

The cylinder *g* and the pipe *h* are filled with some liquid, preferably oil or alcohol.

If it be desired to open the valve *p* the up-

per end of lever *a* is drawn back. This causes the piston *f* to move forward in cylinder *g* and this piston drives before it the liquid in the cylinder which engages the rear end of piston *j* in cylinder *i* causing this piston to move forward and to engage and lift the stem *o* to open valve *p*. To close the valve *p* the movement of the lever *a* is reversed drawing back the piston *f* which draws after it the liquid, the suction of which, aided by the spring *n* if necessary, returns the piston *j* to its first position releasing the stem *o* and permitting the valve *p* to come to a seat.

The perforation *m* in the plug *l* permits the escape of any fluid from the forward end of cylinder *i* and prevents the formation of a vacuum which would prevent the free and quick movement of the piston *j* as indicated by the liquid to the back of this piston. The piston *j* is furnished with a cup packing *s* and with two packing rings *t* to prevent escape of liquid to the forward end of cylinder *i*. The piston *f* is preferably furnished at both its rear and forward ends with cup packings *u*. *w* is an opening through the side of the casting *i* through which any water passing down past valve *p* may escape.

While my device is designed more particularly for opening the drain cocks of locomotive cylinders I do not desire to confine myself solely to this application of it as it will be obvious that it can be equally well used for operating other valves or devices of a similar nature. If it be used for locomotives there would be employed a cylinder *i* and connected parts for operating each drain cock on each cylinder, suitable branch pipes leading from the main liquid pipe *h* to each of these cylinders *i*. *x* is a filling plug through which liquid may be introduced to cylinder *g* whenever additional liquid may be necessary.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent.

1. In a valve operating means, in combination, a valve, a stem or rod carried by or engaging said valve, a cylinder the forward end of which is open to the air, and the rear end of which is closed, a piston, furnished with a cam-like forward end adapted to engage said rod or stem, carried by said cylinder, a liquid carrying pipe, one end of which enters the closed end of said cylinder and the other end of which enters an hydraulic cylinder, said latter cylinder, a piston in said latter cylinder, and means for operating said piston.

2. In a valve operating means, in combination, a valve, a stem or rod carried by or engaging said valve, a cylinder the forward end of which is open to the air and the rear end of which is closed, a piston furnished with a cam-like forward end adapted to engage said rod or stem, carried by said cylinder, a spring adapted to normally throw said piston backward, a liquid carrying pipe one end of which enters the closed end of said cylinder and the other end of which enters an hydraulic cylinder and means for operating said piston.

3. In a valve operating means, in combination, a valve, a stem carried by or engaging said valve, a piston with a cam-like face adapted in its movements to engage and operate said stem and valve, a cylinder open at one end and closed at the other for carrying said piston, and means for introducing and withdrawing a liquid from the closed end of said cylinder.

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Witnesses:

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