

(No Model.)

T. J. ROGERS & J. F. WARREN.
INDICATOR FOR AIR BRAKE PUMPS.

No. 553,294.

Patented Jan. 21, 1896.

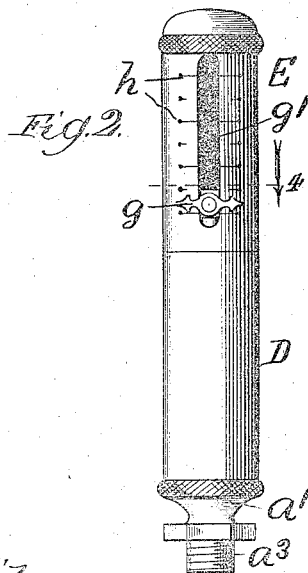
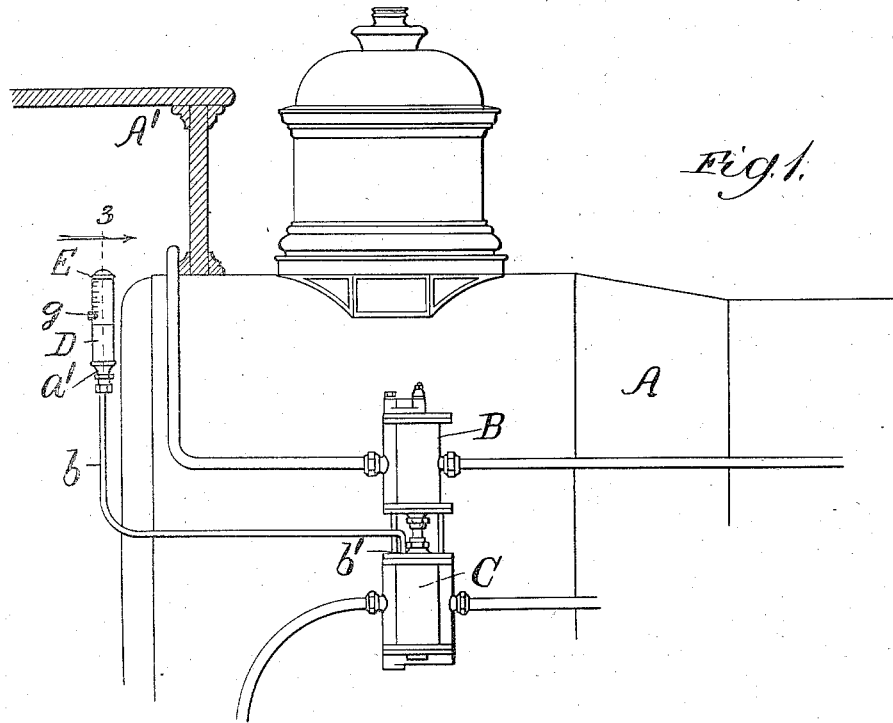
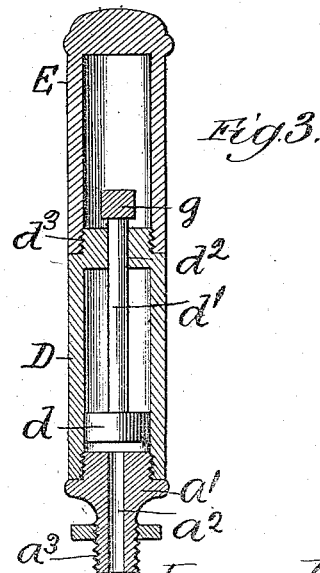
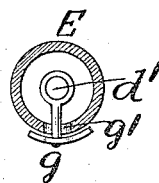


Fig. 4.



Witnesses:
Chas. E. Chubb
L. J. Allen

Inventors:
T. J. Rogers
J. F. Warren
By G. B. Coupland & Co
Attorneys

UNITED STATES PATENT OFFICE.

THOMAS J. ROGERS AND JAMES F. WARREN, OF CHICAGO, ILLINOIS; SAID
WARREN ASSIGNOR TO CARL K. MACFADDEN, OF SAME PLACE.

INDICATOR FOR AIR-BRAKE PUMPS.

SPECIFICATION forming part of Letters Patent No. 553,294, dated January 21, 1896.

Application filed February 18, 1895. Serial No. 538,757. (No model.)

To all whom it may concern:

Be it known that we, THOMAS J. ROGERS and JAMES F. WARREN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Indicators for Air-Brake Pumps; and we 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 appertains to make and use the same.

The object of this invention is to provide an indicating attachment for the air-brake pump, so that the engineer may know at a glance as to whether the pump is working or not.

Under the ordinary arrangement, when a train is in motion the engineer has no positive means of knowing if the air-pump is working, and is therefore liable to lose control of the train when two or more applications of the brake are made in quick succession. It is frequently necessary for an engineer to be compelled to make a second and even a third application in less than that number of minutes. If the air-pump is not working, the control of the train is lost when the third application is made, and often when the second is applied, as the volume of air exhausted is not replaced. If the engineer discovers on the first application that the pump is not working he can bring the train to a full stop before releasing the brakes, and thus avoid the liability of an accident. Under the present arrangement, however, there is no device or attachment provided for instantly indicating that the air-pump is not working. The object, therefore, of this improvement is to provide such a device.

There are a number of causes for the accidental stopping of an air-brake pump, among which might be enumerated the following: clogging of the governor from the accumulation of gum on its working parts, which comes from the oil; the clogging of the oil-supply pipe connecting with the steam-cylinder of the pump; the breaking of the reversing-piston valve of the steam end of the pump; the lodgment of any loose material, such as bits of packing, in the steam-ports; the freezing of the pipe air-cylinder and the reservoir or drum, and from many other causes. It is

also liable to happen when the pump has been stopped by the excess of pressure that it does not start up again to recharge the reservoir when the pressure has been reduced by an application of the brakes.

It will be understood, of course, that the present device does not take the place of the ordinary gage used to indicate the pressure in the air-reservoir or service-pipes, and which does not answer the purpose of this attachment.

Many accidents have been traced directly to the failure of the air-brake pump to work at an opportune moment.

In the drawings, Figure 1 is a broken-away side elevation of that part of a locomotive-boiler to which the air-pump is attached, showing the air-brake pump and the indicating device in their relative positions; Fig. 2, a front elevation of the indicating device; Fig. 3, a vertical central section of the same on line 3, Fig. 1, looking in the direction indicated by the arrow; and Fig. 4, a horizontal section on line 4, Fig. 2.

A may represent a locomotive-boiler; A', a portion of the cab, shown in section; B, the steam-cylinder; and C, the air-cylinder, comprising the air-brake pump.

The indicating device comprises a cylindrical body D, a chambered extension or cap E, a piston d , and a rod d' . A tubular plug a' is inserted in the lower end of cylinder D and is provided with a passage a^2 , extending longitudinally therethrough. The lower extended end of this plug is screw-threaded, as at a^3 , for the engagement of one end of a pipe b , the opposite end of which is connected to the air-cylinder, as at b' , Fig. 1. By means of the connecting-pipe b a direct communication is established between the air-cylinder of the pump and the indicating-cylinder. It is obvious that the pipe-connection b may be connected directly to the indicating-cylinder without the intervention of the tubular plug, which is used more as a matter of convenience in attaching the device.

A piston d is located in the indicating-cylinder and is provided with a rod d' , which extends through a contracted passage d^2 in the upper end of the cylinder and into the chambered extension E, as shown in Fig. 3. The

chambered extension has a threaded engagement with the indicating-cylinder, as at d^3 . The piston-rod d' has an indicating-pointer g , mounted on the upper end thereof and which projects out through a slot g' in the chambered extension surmounting the indicating-cylinder. The surface over which the pointer moves is graduated, as at h . These graduations are not an essential feature in a device of this kind, but are more of an ornamental character in adding a finished appearance. In fact the chambered extension might be dispensed with, as the up-and-down play of the piston-rod could be observed just as well without it; but the chamber protects the rod from being bent or broken, as it might be were it not for the inclosing chamber-extension.

When the air-pump is working, a reciprocating movement is imparted to the piston in the indicator-cylinder—that is, the piston of the indicator is forced upwardly by the pressure of air from the air-cylinder when its piston is moving in a corresponding direction—and on the downstroke of the air-pump piston the indicator-piston is drawn downwardly by the suction and force of gravity, this operation being continuous with the working of the pump, as will be shown by the movement of the indicating-hand, which will be motionless when the pump is at rest. This indicator might be termed a “pulso-meter,” as it is operated by the pulsations of the air-pump, and, having a direct and positive connection therewith, it can never fail to act coincidentally with the working of the pump.

The indicator-pipe may be connected with the steam end of the pump, instead of the

air-cylinder, as shown; but the arrangement shown is preferred.

The indicator is located at some convenient point in the engine-cab within the visual range of the engineer.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The cylinder of an air brake pump, a pipe communicating with the interior of said cylinder so that air or steam pressure in said pipe will change with every stroke of the piston in said cylinder, said pipe leading to a convenient place of observation in the engineer's cab or similar suitable location, and the indicating cylinder directly connected with said pipe, having therein a piston operated by pressure in the pipe, said piston having an indicator rod extending outside the cylinder, all combined substantially as described.

2. The indicator for air brake pumps, consisting of the cylinder body D , having a slot in its side, a contracted passage at its central part, a piston fitting the cylinder at one side of the passage and having a piston rod extending through the contracted passage, an indicating pointer attached to the piston rod and extending through the slot in the cylinder, and means for connecting the cylinder to an air brake pump, all combined substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS J. ROGERS.
JAMES F. WARREN.

Witnesses:

L. M. FREEMAN,
L. B. COUPLAND.