No. 702,802. Patented June 17, 1902.

W. G. LAMB.

RETAINING VALVE.

(Application filed May 7, 1901.)

(No Model.)

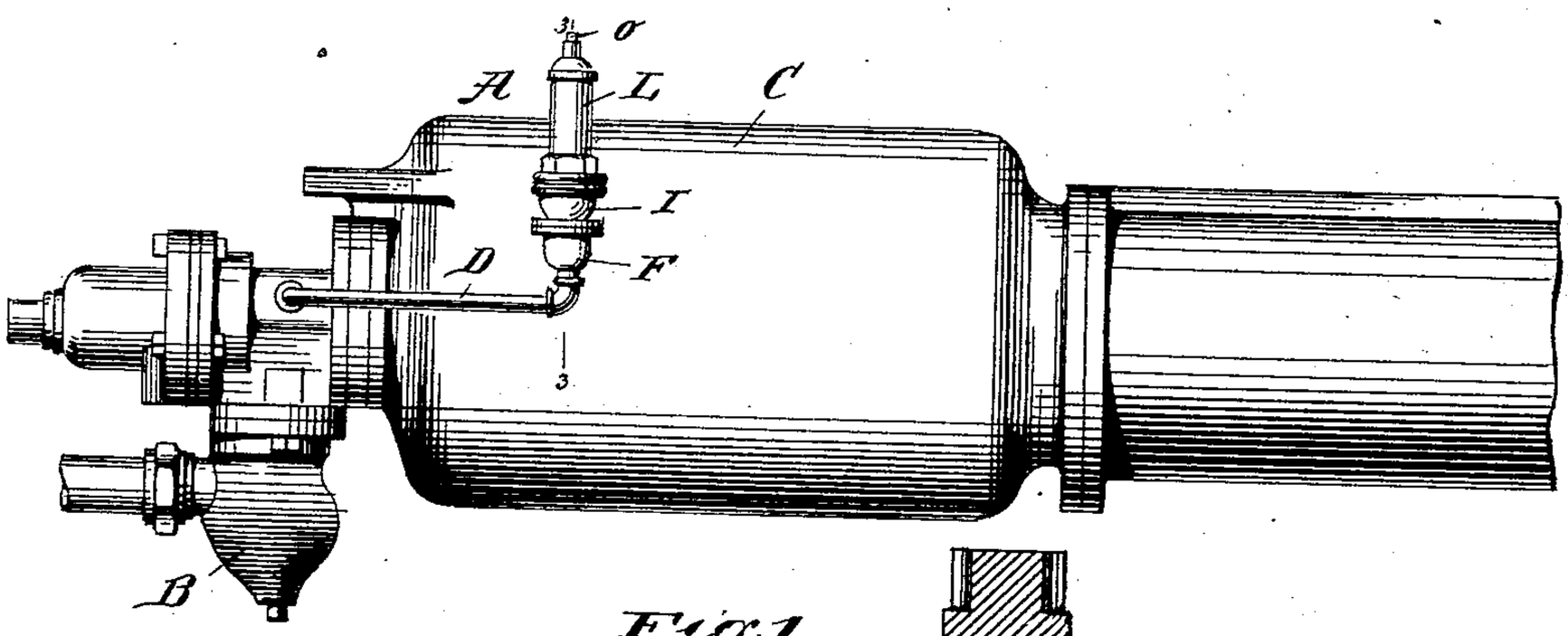

Fig. 1

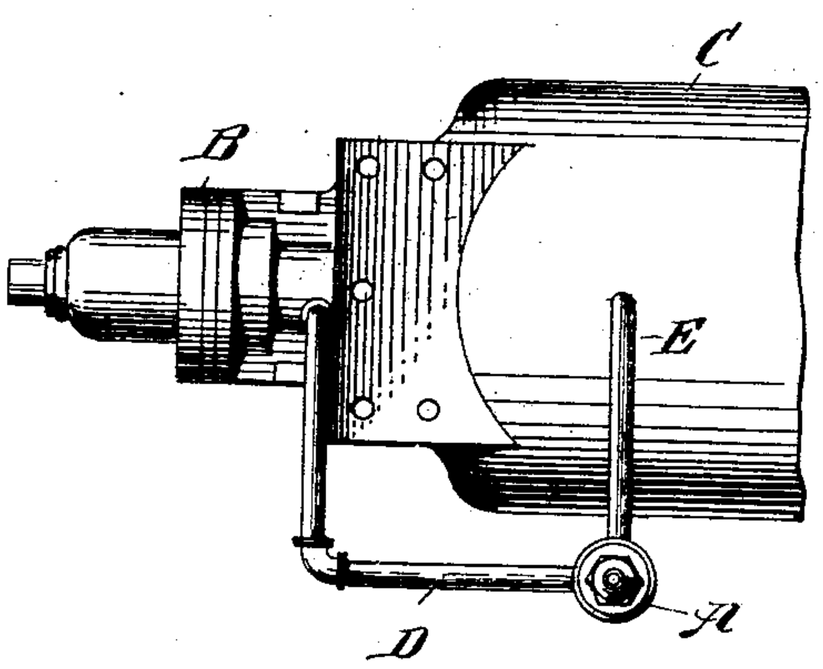

Fig. 2

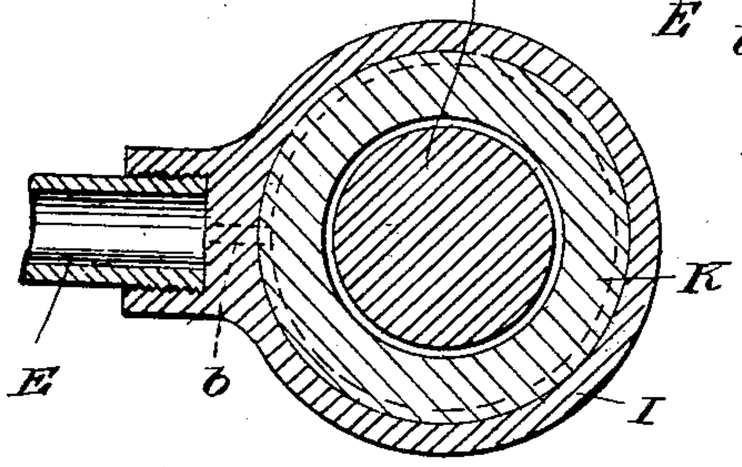

Fig. 4

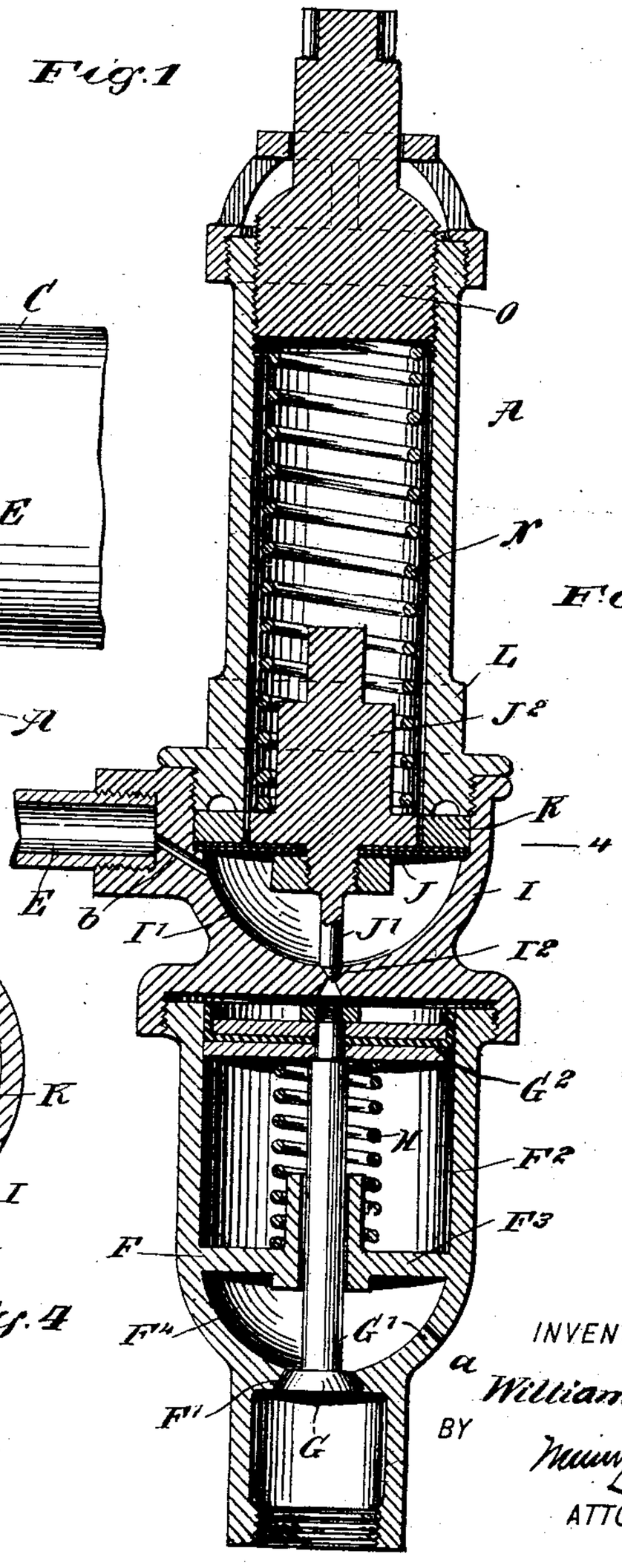

Fig. 3

WITNESSES:

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WILLIAM G. LAMB, OF MEXICO, MEXICO.

RETAINING-VALVE.

SPECIFICATION forming part of Letters Patent No. 702,802, dated June 17, 1902.

Application filed May 7, 1901. Serial No. 59,143. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. LAMB, a citizen of the United States, and a resident of the city of Mexico, Mexico, have invented a new and Improved Automatic Retaining-Valve, of which the following is a full, clear, and exact description.

The invention relates to fluid-pressure brakes of the Westinghouse type; and its object is to provide a new and improved retaining-valve arranged to hold automatically the full pressure on the brakes while recharging the auxiliary reservoir, so that releasing does not take place until the full pressure is obtained in the auxiliary reservoir and to which the retaining-valve is set.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied. Fig. 2 is a plan view of the same, the reservoir being broken away. Fig. 3 is an enlarged transverse section of the improvement on the line 3 3 in Fig. 1, and Fig. 4 is a sectional plan view of the same on the line 4 4 in Fig. 3.

The improved retaining-valve A illustrated is connected with the exhaust of a triple valve B and an auxiliary reservoir C. For the purpose mentioned a pipe D leads from the exhaust of the triple valve B to the lower end of the retaining-valve A, and a pipe E connects the auxiliary reservoir C with the middle portion of the retaining-valve, as hereinafter more fully explained.

The retaining-valve A is provided with a casing or valve-body, preferably made in several parts, of which the lower part F is connected with the pipe D and contains a valve-seat F', adapted to be closed by pressure from the exhaust on a valve G, having its stem G' extending upwardly and carrying a piston G^2, mounted to slide in a cylinder F^2, formed on the part F, said piston G^2 being pressed on by a spring H, the upper end of which rests against the under side of the piston G^2, the lower end being seated on a partition F^3, dividing the cylinder F^2 from an exhaust-chamber F^4, having an outlet-port *a* for allowing the air to escape, as hereinafter more fully explained.

At the top of the cylinder F^2 is screwed or otherwise secured a part I, into which screws the pipe E, previously mentioned, said pipe E connecting by a port *b* with a chamber I', formed in its bottom with a needle-point-valve seat I^2 for connecting the chamber I' with the the top of the cylinder F^2. The seat I^2 is engaged by a needle-point J' of a diaphragm-valve J, having its diaphragm seated on a gasket K, held on the under side of the top part L of the casing or valve-body, said top part being screwed or otherwise secured to the top of the part I. The body J^2 of the diaphragm-valve J is pressed on by a spring N, contained in the top part L and resting against the under side of a plug O, adjustable in the part L, to regulate the tension of the spring N and allow of seating the valve J at the desired pressure.

The operation is as follows: When the air in the auxiliary reservoir C reaches the desired pressure to which the valve J is set—say seventy pounds—then the valve J is moved upward to lift the needle-point J' off the seat I^2 and allow the air to pass from the reservoir C, by way of the pipe E, port *b*, chamber I', and seat I^2, into the upper end of the cylinder F^2 to force the piston G^2 downward against the tension of the spring H and move the valve G from its seat F', so that the exhaust from the triple valve B can pass through the valve-seat F' into the chamber F^4 and by the port *a* to the outer air to release the brakes. In applying the brakes the pressure in the auxiliary and train pipe being reduced, say, to fifty pounds, as the piston of the brake-cylinder is forced ahead the spring N forces the valve J downward against the reduced pressure in the chamber I' and causes the needle-point J' to move to its seat I^2, and thereby disconnect the chamber I' from the upper end of the cylinder F^2. When this takes place, the exhaust from the triple valve causes the valve G to move to its seat F' and hold the pressure in the brake-cylinder to keep the brakes applied until the auxiliary reservoir is replenished to the full pressure—that is, to

seventy pounds—after which the above-described operation is repeated—that is, the pressure of seventy pounds in the chamber I′ causes the diaphragm-valve J to move the needle-point J′ from its seat I^2 to allow this pressure to act on the piston G^2 and force the valve G off its seat to allow escape of air from the exhaust of the triple valve, as above mentioned. Thus by the arrangement described the engineer is enabled to recharge the auxiliary reservoir to the full pressure without releasing the brakes, and this arrangement is especially serviceable on long steep grades, as then the pressure is considerably reduced by leakage and it often becomes necessary to recharge the auxiliary reservoir to keep the brakes applied. Now it is evident that if the brakes have to be released from time to time on a long steep downgrade while recharging the auxiliary reservoir as heretofore practiced it frequently happens that the train obtains such a momentum as to become completely out of control of the engineer. With my improvement above described the brakes remain applied while recharging the auxiliary reservoir.

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

1. In a fluid-pressure brake system of the class specified, the combination with the auxiliary reservoir and ordinary triple valve, of the valve mechanism described, consisting of the valve-casing and pipes D and E connecting it with the triple-valve exhaust and auxiliary reservoir as shown, and having a partition with valve-seat at I^2, the valve J, its spring and adjusting device O, arranged in the upper chamber of the valve-casing the valve being provided with a needle-point seating at I^2 and controlling the air-passage, the second or lower valve G seating upward at a point below the air-outlet *a*, the piston G^2 connected with the valve G and arranged above such air-outlet, and acted on by air-pressure from above as shown and described.

2. In a fluid-pressure brake system, the combination with the auxiliary reservoir and the triple valve, of a valve-casing having an atmospheric vent therein, a means establishing communication between the triple-valve exhaust and the valve-casing, a valve located in the valve-casing, said valve controlling communication between the triple-valve exhaust and the vent in the casing, a connection between the valve-casing and the auxiliary reservoir, and a second valve within the valve-casing, the second valve being controlled by the auxiliary-reservoir pressure and commanding a passage in the valve-casing through which passage the auxiliary-reservoir pressure may pass to actuate the first-named valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM G. LAMB.

Witnesses:
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