(No Model.)

F. L. GUILLEMET.

AIR BRAKE.

No. 571,116. Patented Nov. 10, 1896.

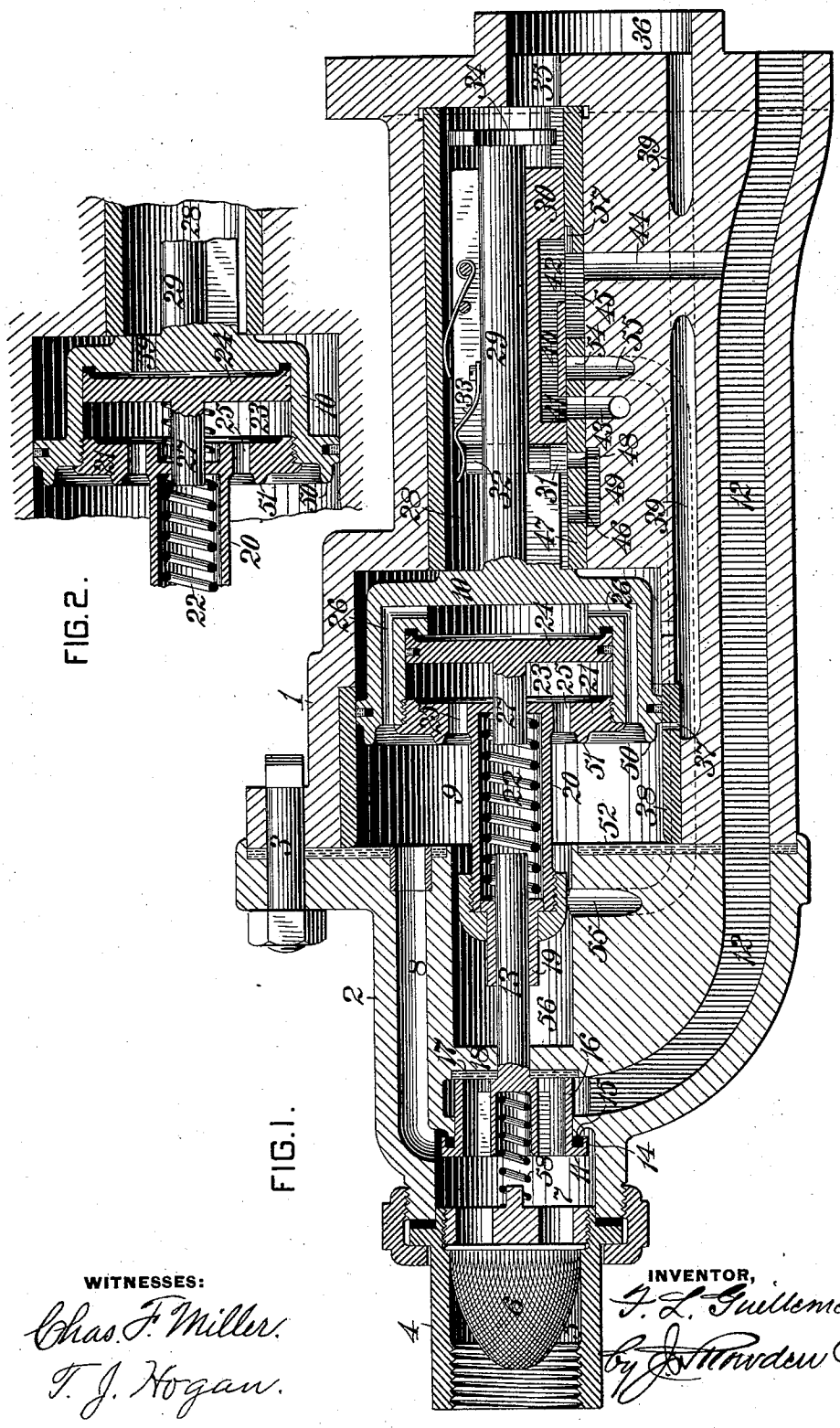

FIG. 2.

FIG. 1.

WITNESSES:

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Att'y.

UNITED STATES PATENT OFFICE.

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AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 571,116, dated November 10, 1896.

Application filed April 29, 1896. Serial No. 589,523. (No model.)

To all whom it may concern:

Be it known that I, FRANÇOIS LEONIDAS GUILLEMET, a citizen of France, (but having declared my intention of becoming a citizen of the United States,) residing at San Francisco, in the county of San Francisco and State of California, have invented or discovered a certain new and useful Improvement in Air-Brakes, of which improvement the following is a specification.

The object of my invention is to provide an improvement in automatic fluid-pressure brake apparatus; and to this end my invention consists in a new and improved triple-valve device, in new and improved means for effecting a local exhaust of fluid under pressure from the train-pipe in emergency applications, and in certain combinations and features of construction, all as hereinafter fully set forth.

In the accompanying drawings, which illustrate my invention, Figure 1 is a central longitudinal section through a quick-action triple-valve device constructed in accordance with my invention; and Fig. 2, a central section through the main and supplemental pistons, showing a modification of my improvement.

The main casing 1 and the cap-section 2 are secured together by means of bolts 3, and the nozzle or section of pipe 4, which is secured to the cap-section, is to be connected with the train-pipe or with a branch therefrom. The passage 5 in the nozzle 4 communicates, through the strainer 6, with a passage 7, and the passage 7 is connected by means of a passage 8 with the main piston-chamber 9 of the triple-valve device, within which the main piston 10 is fitted to slide.

A local exhaust or emergency valve 11, which is closed except in emergency applications, controls communication between the passage 7 and a passage 12, leading to the brake-cylinder.

My improvement is not limited to any particular form of emergency-valve, but in the drawings I have shown an annular valve 11, provided with a gasket or packing 14, which is adapted to bear on the seat 15, and a tubular extension 16, which, when the valve 11 is seated, bears on a gasket 17, surrounding the stem 13 and fitted into the wall or partition 18.

The stem 13 of the emergency-valve 11 extends through the wall or partition 18 and passes through a movable sleeve 19 into a hollow stem 20, which projects from the cap 21 of the main piston of the triple-valve device. Within the hollow stem 20 is a spring 22, which bears at one end against the cap 21 and at the other end against the sleeve 19, and is adapted to offer a yielding resistance to movement of the main piston to the left when the end of the sleeve 19 is pressed into contact with the dividing wall or partition 18.

Within a chamber 23, formed in the main piston 10, is fitted a supplemental piston 24, which is normally, and during service applications, exposed to train-pipe pressure on its opposite sides through the passages 25 and 26. Projecting from one side of the piston 24 is a stem 27, which in emergency applications is adapted to be moved into contact with the stem 13 of the emergency-valve 11, and thereby to unseat the emergency-valve.

A stem 29, which is secured to the main piston 10, extends into the main-valve chamber 28 and is operatively connected with the main valve 30 and graduating-valve 31. The graduating-valve 31 is provided with a stem 32, which passes through the stem 29 and is acted on by a spring 33, which tends to hold the graduating-valve to its seat. The main valve is located between the graduating-valve 31 and a shoulder, collar, guide, or other projection 34 on or near the end of the stem 29, and is of such length as to permit a certain amount of lost motion between the stem 29 and the valve 30, whereby the main piston and its stem and the graduating-valve 31 may be moved independently of the main valve in making graduated applications of the brakes.

The main-valve chamber 28 is at all times in communication with the auxiliary reservoir through the passages 35 and 36, and when the main piston 10 is in its normal position fluid under pressure from the train-pipe is supplied to the auxiliary reservoir through the passages 7 and 8, chamber 9, passage 37 in the bushing 38, and passage 39.

The main valve 30 is provided with a pas-

sage 40, connecting two ports 41 and 42, formed in the face of the valve, and when the main valve is in its normal position and the brakes are released the port 41 registers with one end of a passage 43, leading to the atmosphere, the port 42 registers with a port 45 at the end of a passage 44, leading from the brake-cylinder passage 12, and the brake-cylinder is in communication with the atmosphere through the passages 12 44 and ports and passages 42, 40, 41, and 43.

In making service applications of the brakes a comparatively slight reduction of train-pipe pressure will permit the auxiliary-reservoir pressure to move the main piston to the left until the end of the sleeve 19 bears on the wall or partition 18, and the resistance of the spring 22 prevents further movement. By this movement the graduating-valve 31 will be moved to the left of the port 46 in the bushing 47, and the main valve 30 is moved so that the exhaust-port 43 is closed and the port 41 in the main valve registers with the port 48 in the bushing 47. Fluid under pressure will then flow from the main-valve chamber 28 and from the auxiliary reservoir through the port 46, passage 49, which connects the ports 46 and 48, and the ports 4841, passage 40, ports 42 and 45, and passages 44 and 12 to the brake-cylinder.

When the auxiliary-reservoir and train-pipe pressures are equalized, or nearly so, the main piston 10 and the graduating-valve 31 will be moved to the right until the graduating-valve comes in contact with the left-hand end of the main valve and the friction of the main valve on its seat will prevent further movement. The graduating-valve will then be in position to cover the port 46 and the flow of fluid from the auxiliary reservoir to the brake-cylinder will be cut off. A further slight reduction of train-pipe pressure will cause the graduating-valve to move to the left and uncover the port 46, and fluid under pressure will again flow from the auxiliary reservoir to the brake-cylinder.

When a great and rapid reduction of train-pipe pressure is made, for the purpose of effecting an emergency application of the brakes, the main piston 10 will be moved to the limit of its stroke to the left, the concentric annular flanges 50 and 51 on the main piston 10 will bear on the gasket 52. The chamber 56, into which the hollow stem 20 projects, and the space within the chamber 23, which is on the left-hand side of the supplemental piston 24 will then be cut off from the train-pipe by the flange 51 bearing on the gasket 52 and making a tight joint therewith. The main valve 30 will then be in position to uncover the extension 57 of the port 45 and to close the port 48 and the exhaust-port 43, and the port 42 in the main valve will be in position to connect the port 45 with the port 54 and passage 55, which leads from the chamber 56. The fluid under pressure on the left-hand side of the supplemental piston 24 will then be exhausted to the brake-cylinder through the passages and ports 55, 54, 42, 45, 44, and 12, the train-pipe pressure, acting on the right-hand side of the supplemental piston 24, will move that piston to the left, the contact of the stem 27 with the stem 13 will unseat the emergency-valve 11, and fluid under pressure will flow from the train-pipe to the brake-cylinder through the passage 7, through valve 11, and passage 12. At the same time fluid under pressure will flow from the main-valve chamber 28 and from the auxiliary reservoir to the brake-cylinder through the ports 57 and 45 and through the passages 44 and 12, and when the auxiliary-reservoir and train-pipe pressures are nearly equalized the emergency-valve will be closed by the action of the spring 58 and the supplemental piston 24 will be moved to the right, relative to the main piston, by the action of the spring 58 and the fluid-pressure on the left-hand side of the supplemental piston. Fluid under pressure will continue to flow from the auxiliary reservoir to the brake-cylinder through the ports 57 and 45 and through the passages 44 and 12 until the auxiliary-reservoir and brake-cylinder pressures have equalized, and when the pressure in the chamber 56 exceeds the train-pipe pressure on the right of the supplemental piston the supplemental piston will be moved to the limit of its stroke to the right, relative to the main piston.

If preferred, the supplemental piston 24 may be exposed on its right-hand side to auxiliary-reservoir pressure through a passage 59, as shown in Fig. 2, and the passages 26 in the main piston may then be dispensed with.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, in a quick-action triple-valve device, of an emergency-valve, a main piston, a supplemental piston located in a chamber in the main piston and exposed on its opposite sides to pressure in the train-pipe, and a valve operated by the main piston for releasing fluid under pressure from one side of the supplemental piston to effect an emergency application of the brakes, substantially as set forth.

2. The combination, in a quick-action triple-valve device, of a local-exhaust valve for releasing fluid under pressure from the train-pipe, a main piston, a supplemental piston engaging with the main piston and exposed on its opposite sides to the pressure in the train-pipe, and a valve for releasing fluid under pressure from one side of the supplemental piston, to cause opening movement of the local-exhaust valve, substantially as set forth.

3. The combination, in a quick-action triple-valve device, of a local-exhaust valve for releasing fluid under pressure from the train-pipe, a main piston, a supplemental piston which is normally exposed to train-pipe pressure, means whereby the movement of the main piston is adapted to cut off communication between the train-pipe and one side of

the supplemental piston, and a valve for releasing fluid under pressure from one side of the supplemental piston to cause opening movement of the local-exhaust valve, substantially as set forth.

4. The combination, in a triple-valve device, of a piston, a main valve, a graduating-valve, a port in the seat of the main valve which is controlled by the graduating-valve and a passage in the main valve which is adapted to be connected with the port to permit fluid under pressure to flow to the brake-cylinder, substantially as set forth.

5. The combination, in a triple-valve device of a casing, a piston working in a chamber in the casing, a main valve operated thereby, a passage in the main valve adapted to connect with a passage in the casing, and a graduating-valve, located between the piston and the main valve, and controlling the passage in the casing, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANÇOIS L. GUILLEMET.

Witnesses:

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PETER ZAPPETTMI.