

(No Model.)

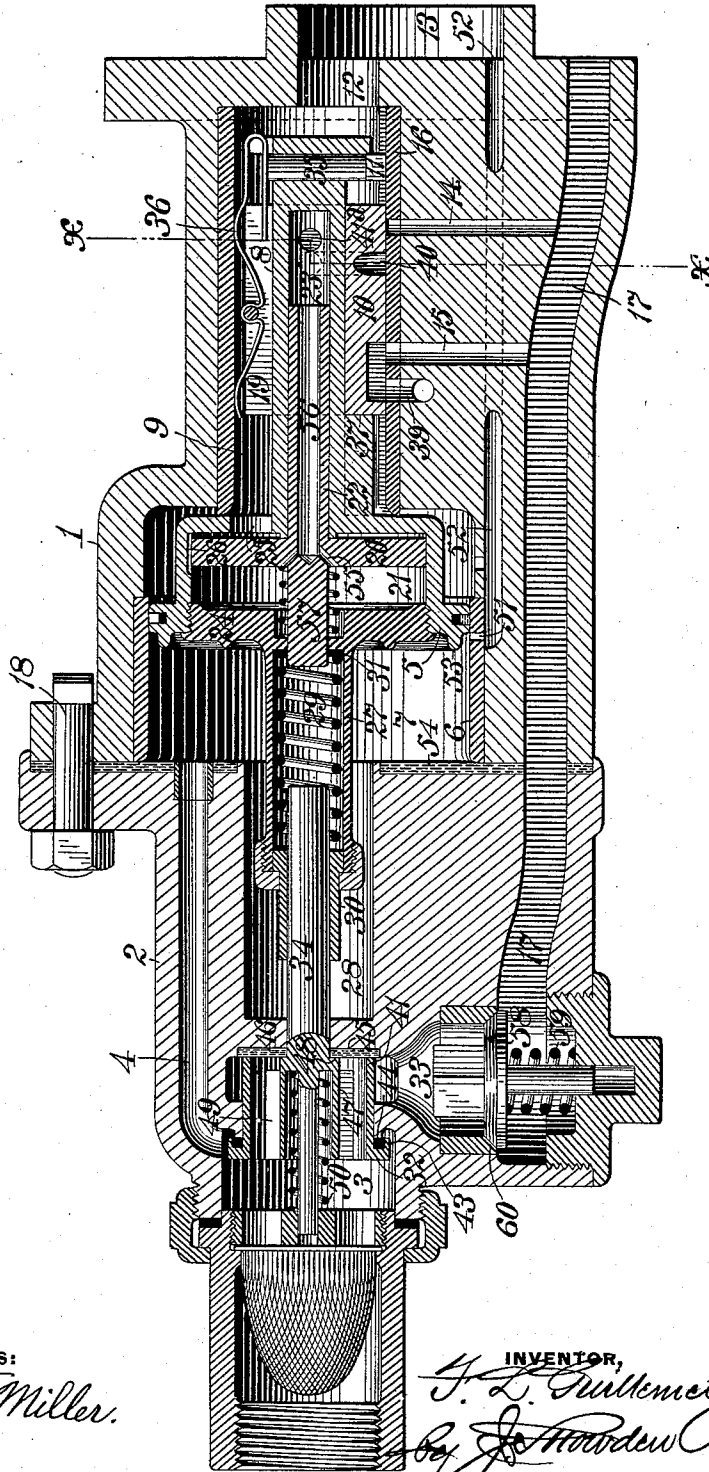
2 Sheets—Sheet 1.

F. L. GUILLEMET.
AIR BRAKE.

No. 571,115.

Patented Nov. 10, 1896.

FIG. 1.



WITNESSES:

Chas. F. Miller.
T. J. Hogan.

INVENTOR,

F. L. Guillemet
By J. H. Woodward

Att'y.

(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

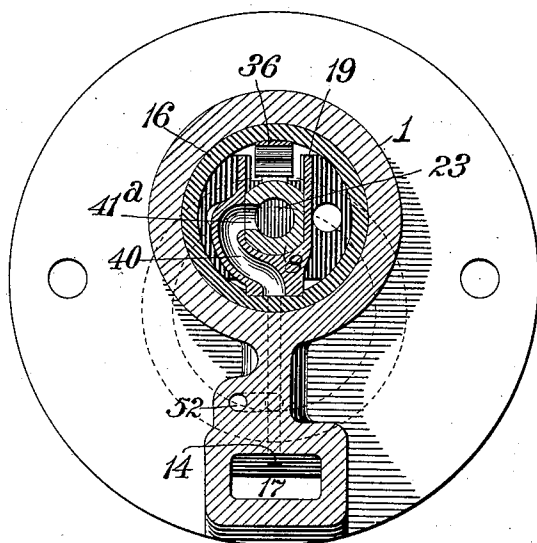


FIG. 3.

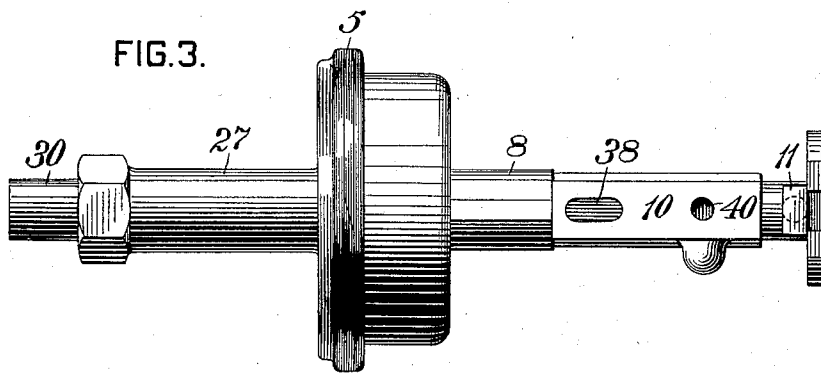
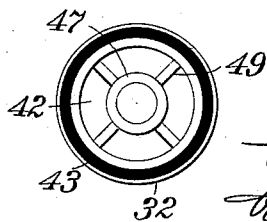


FIG. 4.



WITNESSES:

Chas. F. Miller.
T. J. Hogan.

INVENTOR,

F. L. Guillemet
by J. Howard Bell.

Att'y.

UNITED STATES PATENT OFFICE.

FRANÇOIS L. GUILLEMET, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO
THE WESTINGHOUSE AIR BRAKE COMPANY, OF WILMERDING, PENN-
SYLVANIA.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 571,115, dated November 10, 1896.

Application filed April 29, 1896. Serial No. 589,522. (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 means controlled thereby for effecting emergency applications of the brakes, and in certain combinations and features of construction, all as hereinafter fully set forth.

In the accompanying drawings, which illustrate an application of my invention, Figure 1 is a central longitudinal section through a quick-action triple-valve device constructed in accordance with my invention; Fig. 2, a transverse section on the line *xx* of Fig. 1; Fig. 3, an inverted plan view of the main and graduating valves and main piston of the triple-valve device, these parts being removed from the casing; and Fig. 4, an end view of the emergency-valve.

In the embodiment of my invention as shown in the drawings the main casing 1 of the triple-valve device has secured to it a cap-section 2 by means of bolts 18, and the cap-section is provided with a passage 3, which communicates with the train-pipe of an automatic fluid-pressure brake system. The passage 3 is connected with the main-piston chamber 7 of the triple-valve device by means of a passage 4, formed in the cap-section. The main piston 5 of the triple-valve device is fitted to slide in a bushing 6, secured in the main-piston chamber, and is provided with a stem 8, which extends into the main-valve chamber 9 and is connected with the main valve 10 and graduating-valve 11. A feed-passage 51 is uncovered by the main piston 5 when in its normal position and communicates with a passage 52, leading to the auxiliary reservoir. The main-valve chamber

9 communicates with an auxiliary reservoir through the passages 12 and 13, formed in the end of the main casing 1, and passages 14 and 15, which are formed in the main casing and in the bushing 16, communicate with a passage 17, leading to the brake-cylinder.

The stem 8 of the main piston 5 is formed with flat sides on a portion of its length and fitted between the flanges 19 on the main valve, so as to slide easily therein without leaving any considerable space between the sides of the stem and the flanges.

A supplemental piston 20 is fitted in a chamber 21, formed in the main piston, and is provided with a hollow stem 22, which extends into a passage 23 in the stem 8 of the main piston. The chamber 21 is closed on one side by a cap 24, and on its other side is open to the main-valve chamber through the passages 25, and a groove or passage 26, formed in the wall of the chamber 21, permits the passage of fluid around the supplemental piston 20 when the piston is in its normal position relative to the main piston, so that the piston 20 is normally exposed to auxiliary-reservoir pressure on its opposite sides.

A hollow stem 27 extends from the cap 24 of the main piston into the chamber 28 and incloses a spring 29, which bears at one end on a movable sleeve 30 and at its other end on a gasket 31, which surrounds a stem 32, projecting from the supplemental piston 20. A local-exhaust valve or emergency-valve 32 controls the local exhaust of fluid from the train-pipe through the passages 3, 33, and 17, and is provided with a stem 34, which extends into the chamber 28, and is fitted to slide in the sleeve 30 on the end of the hollow stem 27.

As shown in the drawings, the valve 32 is an annular valve with a tubular extension 41, through which passages 42 are formed. The valve 32 is provided with a gasket 43, which bears on a seat 44, and the end of the tubular extension 41 is adapted to bear on a gasket 45, which surrounds the stem 34 and is fitted on the dividing-wall or partition 46 between the chamber 28 and the passage 33. A hub or central portion 47 of the valve 32 is connected with the tubular portion 41 by means

of the webs 49 and is provided with a shoulder 48, which is adapted to bear on the gasket 45. The valve 32 is normally held to its seat by a spring 50.

5 The graduating-valve 11 is provided with a stem 35, which passes through the main-piston stem 8 and is pressed by a spring 36, which is secured to the flanges of the main valve and which tends to hold both the main valve
10 and the graduating-valve to their seats. The main valve 10 is fitted between the graduating-valve and a shoulder 37 on the stem 8 with sufficient lost motion to permit the necessary independent movement of the gradu-
15 ating-valve in service applications of the brakes. When the main valve is in its normal position, a cavity 38 in the main valve connects the passage 15 with an exhaust-passage 39, leading to the atmosphere.

20 A passage 40 in the main valve 10 extends from the face of the main valve upward through the valve and through one of the flanges 19, and its upper end is adapted to register with a port 41^a, which is formed in
25 one of the flat sides of the main stem 8 and which opens into the passage 23 in the main stem. When the parts are in their normal positions and during service applications, the passage 40 is closed at its lower end.

30 When a slight reduction of pressure is made in the train-pipe for the purpose of effecting a service application of the brakes, the main piston 5 is moved to the left by auxiliary-reservoir pressure, the feed-passage 51 is cut off
35 from the train-pipe, the sleeve 30, which surrounds the stem 34, comes in contact with the wall or partition 46, and the spring 29 is slightly compressed. During this movement of the piston 5 the graduating-valve 11 comes
40 in contact with the right-hand end of the main valve 10 and the two valves 10 and 11 are together moved to the left, so as to disconnect the passage 15 from the passage 39 and so as to uncover the passage 14. Fluid under pres-
45 sure from the auxiliary reservoir then flows to the brake-cylinder through the passages 14 and 17 until the pressures in the train-pipe and auxiliary reservoir are nearly equalized, when the main piston 5 will be moved to the
50 right by the action of train-pipe pressure and the pressure of the spring 29 until the shoulder 37 on the main stem 8 abuts against the main valve 10. The graduating-valve 11 will then be in position to cover the passage 14, and
55 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 main piston 5 and the graduating-valve 11 to move to the left with-
60 out moving the main valve 10, the passage 14 will again be uncovered, and fluid from the auxiliary reservoir will again flow to the brake-cylinder. When the auxiliary-reservoir pressure has nearly equalized with the
65 train-pipe pressure, the graduating-valve will be moved to the right and the passage 14 be closed. If desired, this may be repeated until

the auxiliary-reservoir pressure has equalized with the brake-cylinder pressure, or the same equalization of brake-cylinder and auxiliary-
70 reservoir pressures may be effected by a continued gradual reduction of train-pipe pressure. During service applications of the brakes the supplemental piston 20 has the movement relative to the main piston 5.
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When a sufficiently great and rapid reduction of train-pipe pressure is made to effect an emergency application of the brakes, the main piston 5 is moved to the limit of its stroke to the left, in which position the an-
80 nular flange 53 bears on the gasket 54, the graduating-valve 11 comes in contact with the main valve 10, and the main valve 10 is moved to the left into position to close the exhaust-passage 39 and to cause the passage 40 in the
85 main valve to register with the passage 15 in the casing. The port 41^a in the main-piston stem 8 then registers with the upper end of the passage 40 in the main valve, the chamber 21 on the left of the supplemental piston 20 is connected with the brake-cylinder
90 through the passages 55, 56, 23, 41^a, 40, 15, and 17, and the reduction of pressure on the left of the piston 20, caused by the exhaust of fluid from the chamber 21, permits the
95 auxiliary-reservoir pressure on the right of piston 20 to move that piston to the limit of its stroke in the chamber 21. By this movement of the piston 20 the stem 57 is brought into contact with the stem 34 of the emer-
100 gency-valve 32, the emergency-valve is unseated, and fluid under pressure flows from the train-pipe through the valve 32 into the passage 33, unseats the check-valve 58, and flows through the passage 17 to the brake-
105 cylinder. At the same time fluid from the auxiliary reservoir flows through the passage 14, which is uncovered by both the main and graduating valves, and through the passage 17 to the brake-cylinder.
110

The check-valve 58 is normally held to its seat by means of a spring 59, and may be fitted so as to close and totally prevent any return of fluid to the train-pipe, or, as shown
115 in the drawings, a small passage 60 may be employed to permit a gradual return flow of fluid after the auxiliary-reservoir and brake-cylinder pressures have equalized, for the purpose of reducing the pressure therein and permitting a quicker release of the brakes.
120

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

1. The combination, in a quick-action triple-valve device, of a main piston, a supplemental piston, a local-exhaust valve adapted
125 to be operated by the movement of the supplemental piston, and a valve operated by one of the pistons and controlling the release of fluid under pressure from the other piston through a passage in the stem of one of the
130 pistons, substantially as set forth.

2. The combination, in a quick-action triple-valve device, of a main piston, a supplemental piston exposed on its opposite sides to

auxiliary-reservoir pressure, a local-exhaust valve adapted to be operated by the movement of the supplemental piston, and a valve operated by the main piston and controlling the release of fluid under pressure from the supplemental piston through a passage in the stem of the main piston, substantially as set forth.

3. The combination, in a quick-action triple-valve device, of a main piston, a supplemental piston, a local-exhaust valve adapted to be operated by the movement of the supplemental piston, and a valve operated by the main piston and controlling the release of fluid under pressure from the supplemental piston through a passage in the stem of the main piston, substantially as set forth.

4. The combination, in a quick-action triple-valve device, of a main piston, a supplemental piston fitted in a chamber in the main piston and exposed to fluid under pressure, a local-exhaust valve adapted to be operated by the movement of the supplemental piston, and a valve operated by a reduction of train-pipe pressure for releasing fluid under pressure from one side of the supplemental piston to effect an emergency application of the brakes, substantially as set forth.

5. The combination, in a quick-action triple-valve device, of a main piston, a supplemental piston fitted in a chamber in the main piston and exposed to fluid under pressure on its opposite sides, a local-exhaust valve adapted to be operated by the movement of the supplemental piston, and a main valve operated by the main piston and controlling the release of fluid under pressure from one side of the supplemental piston, substantially as set forth.

6. The combination, in an automatic fluid-pressure brake apparatus, of a release-valve for releasing fluid under pressure from the train-pipe, a main piston, a supplemental piston fitted in the main piston and adapted by its movement to operate the release-valve, a main valve, and a passage in the main valve

through which fluid under pressure may be released from one side of the supplemental piston, substantially as set forth.

7. The combination, in a quick-action triple-valve device, of a main piston, a supplemental piston fitted in a chamber in the main piston and adapted to operate a local-exhaust valve, a passage in the stem of the main piston in which the stem of the supplemental piston is fitted, a passage in the stem of the supplemental piston through which fluid under pressure may be released to actuate the supplemental piston, and a valve controlling the release of fluid under pressure from one side of the supplemental piston, substantially as set forth.

8. The combination, in a quick-action triple-valve device, of a main piston and a supplemental piston, fitted one within the other and normally exposed to fluid under pressure, a local-exhaust valve adapted to be operated by the movement of the supplemental piston, and a valve operated by a reduction of train-pipe pressure for releasing fluid under pressure from one side of the supplemental piston to effect an emergency application of the brakes, substantially as set forth.

9. The combination, in a quick-action triple-valve device, of a main piston and a supplemental piston, fitted one within the other and normally exposed to fluid under pressure, a valve operated by the movement of the main piston for effecting a service application of the brakes on a slight or gradual reduction of train-pipe pressure and a valve, operated by a greater or more rapid reduction of train-pipe pressure, for releasing fluid under pressure from one side of the supplemental piston to effect an emergency application of the brakes, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANÇOIS L. GUILLEMET.

Witnesses:

J. F. FUGAZI,

PETER ZAPPETTI.