No. 606,712. Patented July 5, 1898.

F. L. GUILLEMET.

AIR BRAKE.

(Application filed June 3, 1896.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 4.

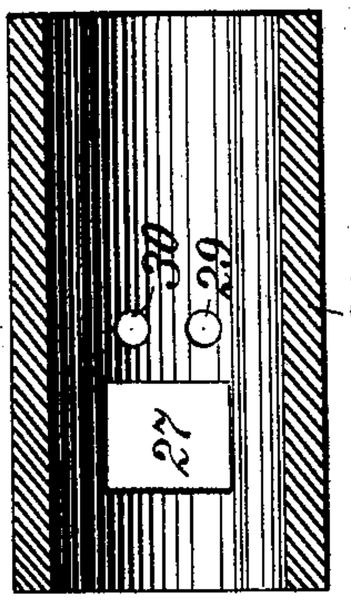


FIG. 5.

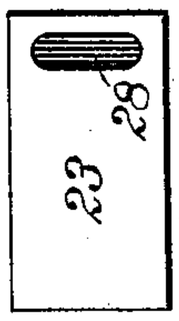


FIG. 1.

WITNESSES:

T. J. Hogan.

Chas. F. Miller.

INVENTOR,

F. L. Guillemet

by J. Stewardson Bell.

Att'y.

No. 606,712.

Patented July 5, 1898.

F. L. GUILLEMET.

AIR BRAKE.

(Application filed June 3, 1896.)

(No Model.)

2 Sheets—Sheet 2.

FIG. 2.

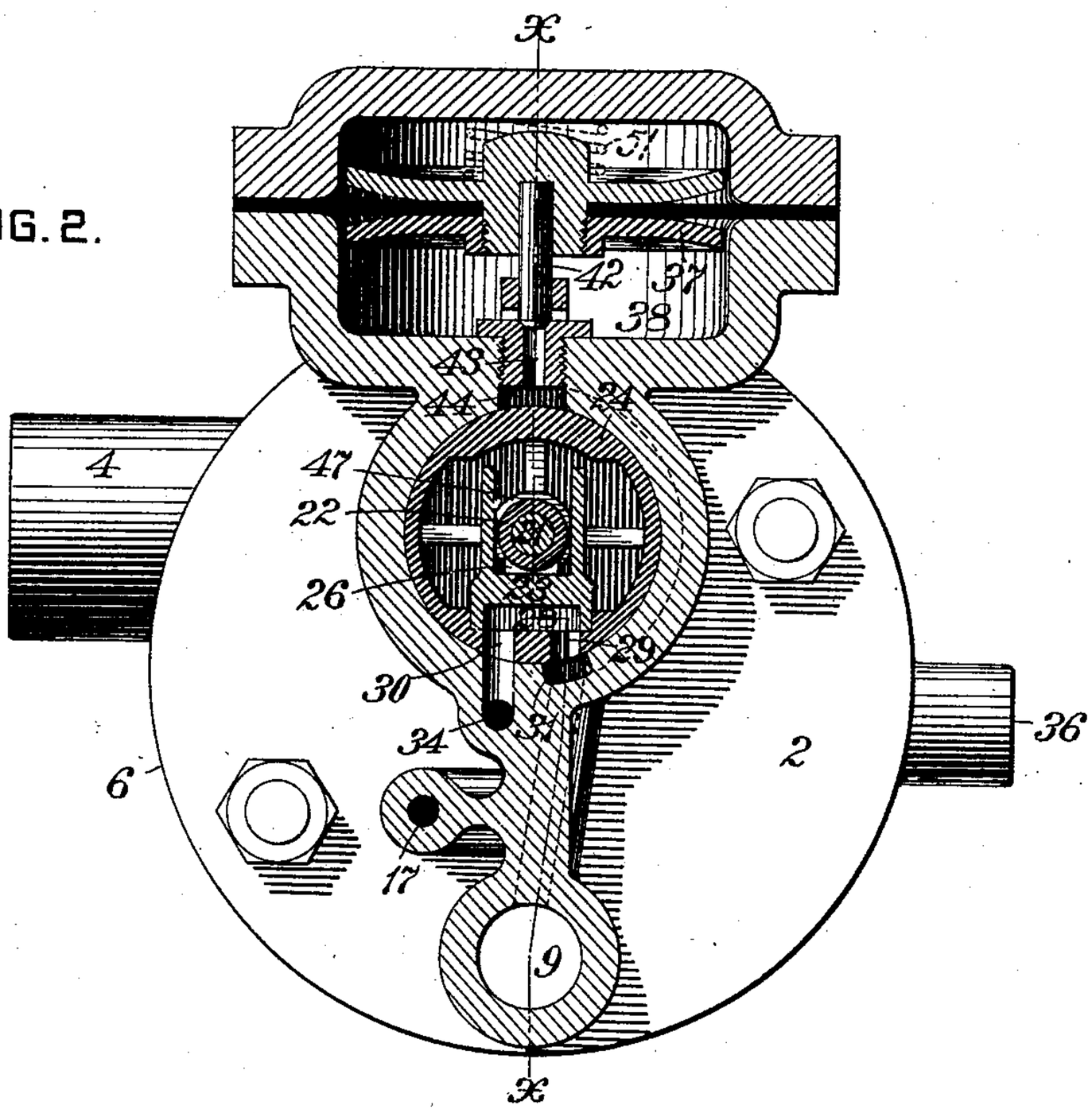
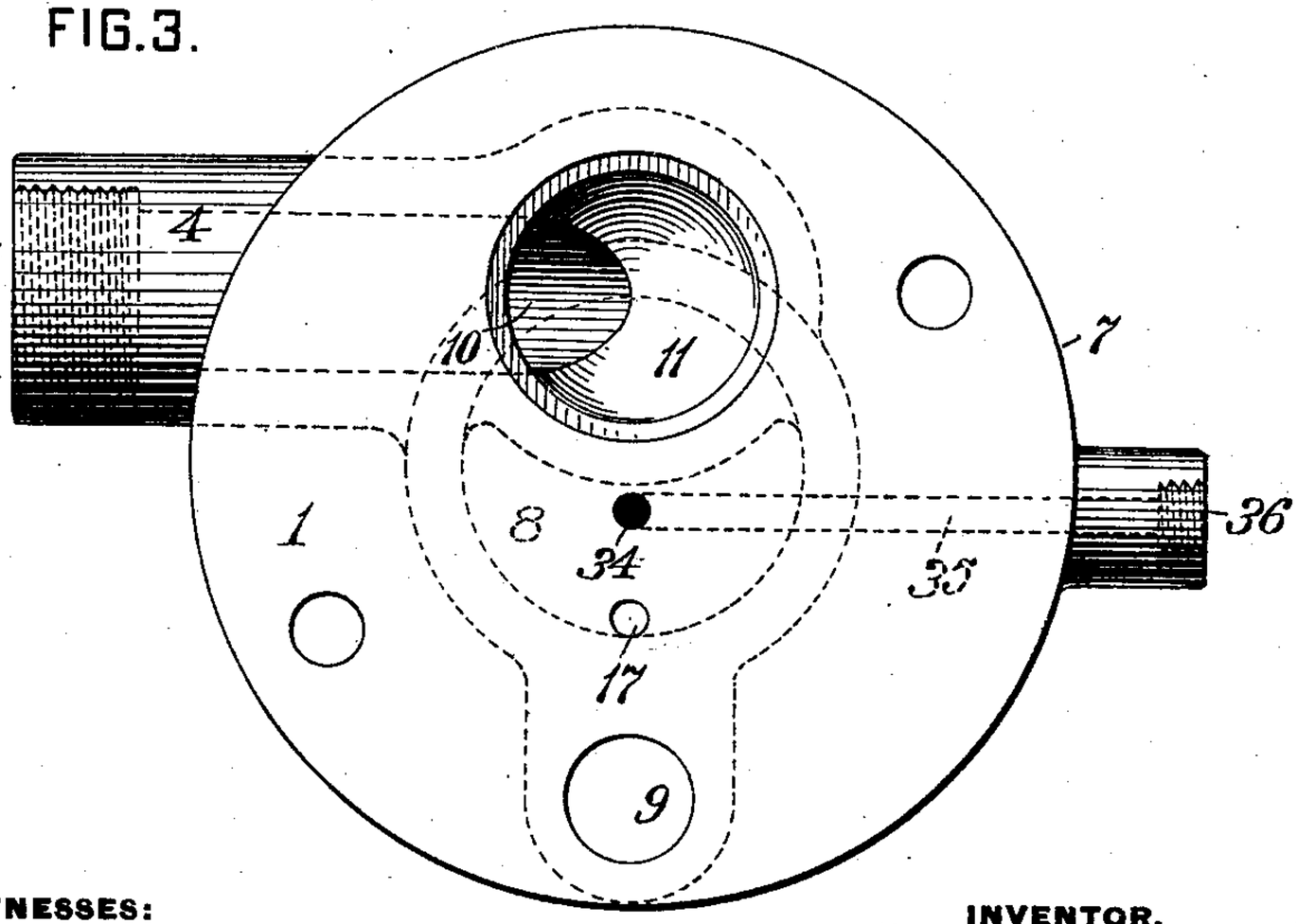


FIG. 3.



WITNESSES:

T. J. Hogan,

Chas. F. Miller.

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, PENNSYLVANIA.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 606,712, dated July 5, 1898.

Application filed June 3, 1896. Serial No. 594,094. (No model.)

To all whom it may concern:

Be it known that I, FRANÇOIS L. GUILLEMET, a citizen of France, (but having declared my intention to become 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 and in the combination therewith of means for effecting a local exhaust of fluid from the train-pipe of an automatic fluid-pressure brake system 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, on the line *x x* of Fig. 2, of a triple-valve device embodying my invention; Fig. 2, a transverse section on the line *y y* of Fig. 1; Fig. 3, a transverse section on the line *z z* of Fig. 1; Fig. 4, a plan view of the seat of the slide-valve controlling the local release of fluid from the train-pipe and the exhaust from the brake-cylinder, and Fig. 5 a view of the face of the slide-valve.

As shown in the drawings, the casing of the triple-valve device is formed in two sections 1 and 2, which are provided with flanges 6 and 7 and bolted together, with a gasket 3 between them. The section 1 is provided with a nozzle 4, which is adapted to be connected with the train-pipe, and with a flange 5 for bolting the section 1 to the auxiliary reservoir or brake-cylinder. The passages 8 and 9 in the section 1 communicate with the auxiliary reservoir and brake-cylinder, respectively.

A passage 10 in the nozzle 4 communicates with the valve-chamber 12 through a passage 11, in which the strainer 13 is located. In the chamber 14, which is at all times in open communication with the valve-chamber 12, a movable abutment or piston 15 is fitted to work in the bushing 16 and is exposed on one side to train-pipe pressure and on the other side to auxiliary-reservoir pressure, the space on the left of the piston 15 being in communication with the auxiliary reservoir through the passages 17 and 8. The piston 15 is provided with a central tubular extension or hollow stem 18, within which is located a spring 19, bearing at one end on a screw-cap 20 and at its other end on a stem 21, which passes through and is movable longitudinally in the reduced portion 22 of the hollow stem 18. A slide-valve 23 is seated on the bushing 24 in position to be engaged by the shoulders or projections 25 and 26 on the hollow stem 18 and its extension 22. The distance between the shoulders 25 and 26 is somewhat greater than the length of the valve 23, so that the piston 15 may have a partial movement independent of the valve 23.

The valve 23 when in its normal position, as shown in Fig. 1, closes a passage 27, through which fluid under pressure is released from the train-pipe when the valve 23 is moved far enough to the right to open the passage 27, and a cavity 28 in the valve 23 normally connects the two ports 29 and 30 in the bushing 24. The port 29 communicates through the passages 31 and 32 with the brake-cylinder passage 9, and the port 30 communicates through the passages 33, 34, and 35 with the atmosphere, the passage 35 opening through the exhaust-nozzle 36. (Shown in Figs. 2 and 3.)

A movable abutment or piston 37 is located in a chamber 38 and normally exposed on both sides to train-pipe pressure admitted through the passages 39, 41, and 40. The passage 39 may open into the valve-chamber 12 or into passage 11, or into any other chamber, space, or passage which is permanently open to the train-pipe, and the passage 40 is connected with the piston-chamber 14 by a small passage 41 in the bushing 16, the passage 41 being so located that when the piston 15 is in its normal position the passage 41 is on the train-pipe side of the piston, and when the piston 15 is moved to the right, in applying the brakes, far enough to cause the valve 23 to close the ports 29 and 30 in the bushing 24 the piston will be on the right of the port or passage 41, and the space below the mov-

able abutment 37 will be in communication with the space on the left of piston 15, which communicates with the auxiliary reservoir.

A graduating-valve 42 is connected with and operated by the movable abutment 37 and controls a passage 43, which is connected by a passage 44, formed around the bushing 24, and by the passage 32 with the brake-cylinder passage 9. A spring 51 (shown in dotted lines) may be employed to insure the closing of the valve 42 when the fluid-pressure on the opposite sides of the diaphragm 37 is equalized.

When the train-pipe is charged with fluid under pressure, the parts will occupy the positions shown in Fig. 1. The piston 15 will be to the left of the port 41 in position to uncover the feed-groove 45 in the bushing 16, and fluid under pressure will flow from the train-pipe through the feed-groove 45 and passages 17 and 8 to the auxiliary reservoir. The opposite sides of the abutment 37 will be exposed to train-pipe pressure admitted through the passages 39, 41, and 40, and the graduating-valve 42 will be closed. The valve 23 will be in position to close the passage 27, and the brake-cylinder will be open to the atmosphere through the passages 9 32 31, port 29, cavity 28 in the valve 23, port 30, and passages 33, 34, and 35.

In making service applications of the brakes a comparatively slight reduction of train-pipe pressure will permit the auxiliary-reservoir pressure to move the piston 15 to the left and with it the valve 23 until the shoulder 46 on the stem 21 comes in contact with the guide 47, when the resistance of the spring 19 will prevent further movement. By this movement the feed-passage 45 is closed, the valve 23 closes the ports 29 and 30 and cuts off communication between the brake-cylinder and atmosphere, the port 41 is put in communication with the space on the left of the piston 15, and the lower side of the abutment 37 is exposed to auxiliary-reservoir pressure.

The auxiliary-reservoir pressure below the abutment 37 being greater than the train-pipe pressure on its upper side will unseat the graduating-valve 42, and fluid under pressure will flow from the auxiliary reservoir through the passages 8 and 17, through the space on the left of piston 15, through the passages 41 and 40, chamber 38, and passages 43, 44, 32, and 9 to the brake-cylinder.

When the auxiliary-reservoir pressure has nearly equalized with the train-pipe pressure, the graduating-valve 42 will close and cut off the flow to the brake-cylinder. A further slight reduction of train-pipe pressure will cause the pressure below the abutment 37 to again unseat the graduating-valve, and fluid under pressure will again flow from the auxiliary reservoir to the brake-cylinder until the auxiliary-reservoir pressure has nearly equalized with the train-pipe pressure, when the graduating-valve will close. This may be repeated as often as desired or until the auxiliary-reservoir and brake-cylinder pressures have equalized.

The brakes may be released by recharging the train-pipe, when the parts will be returned to the positions shown in Fig. 1.

When a sufficiently great and rapid reduction of train-pipe pressure is made to effect an emergency application of the brakes, the piston 15 will be moved to the limit of its stroke to the right and will bear on the gasket 48, the shoulder 46 on the stem 21 will come in contact with the guide 47, the spring 19 will be compressed, the valve 23 will close the ports 29 and 30 and open the large passage 27, and fluid under pressure will flow from the train-pipe through the passages 10 11, chamber 12, and passage 27, and unseating the check-valve 49 will flow to the brake-cylinder through the passage 9. At the same time the valve 42 will be unseated and fluid under pressure will flow from the auxiliary reservoir to the brake-cylinder.

When the pressure in the brake-cylinder is nearly equal to the pressure in the train-pipe, the check-valve 49 will be closed by the spring 50, and the return of fluid from the brake-cylinder to the train-pipe will be prevented.

The spring 52, tending to hold the valve 23 to its seat, should be sufficiently stiff to prevent the valve 23 from being unseated by brake-cylinder pressure in case the train-pipe is ruptured or the pipe-couplings are uncoupled or if from any other cause the train-pipe is emptied.

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

1. The combination, in a triple-valve device having connections to a train-pipe and to an auxiliary reservoir, of a movable abutment which is normally exposed on its opposite sides to train-pipe pressure, admitted thereto through freely-connecting passages, and a graduating-valve operated by the abutment and controlling the release of fluid from the auxiliary reservoir to the brake-cylinder, substantially as set forth.

2. The combination, in a triple-valve device, of a movable abutment, exposed on one side to auxiliary-reservoir pressure and on the other side to train-pipe pressure, a valve operated thereby and controlling the exhaust of fluid from the brake-cylinder, an independent movable abutment and a graduating-valve operated thereby for controlling the flow of fluid from the auxiliary reservoir to the brake-cylinder, substantially as set forth.

3. The combination, in a triple-valve device having connections to a train-pipe and to an auxiliary reservoir, of a movable abutment normally exposed on its opposite sides to train-pipe pressure, a graduating-valve operated by the abutment and controlling the flow of fluid from the auxiliary reservoir to the brake-cylinder, a separate movable abutment, and a valve operated thereby and controlling the exhaust of fluid from the brake-cylinder, substantially as set forth.

4. The combination, in a triple-valve device, of a movable abutment, a valve operated thereby and controlling the local release of fluid from the train-pipe, and the exhaust of fluid from the brake-cylinder, an independent movable abutment, and a graduating-valve operated thereby, substantially as set forth.

5. The combination, in a triple-valve device, of a movable abutment exposed on one side to auxiliary-reservoir pressure and on the other side to train-pipe pressure, a valve operated thereby, which is located on the train-pipe side of the movable abutment and which controls directly the release of fluid from the train-pipe and the exhaust of fluid from the brake-cylinder, and an independent valve device for controlling the flow of fluid from the auxiliary reservoir to the brake-cylinder, substantially as set forth.

6. The combination, in a triple-valve device, of a movable abutment which is normally exposed on its opposite sides to train-pipe pressure, a graduating-valve operated by the abutment, and means whereby, in applications of the brakes, the abutment is exposed on one side to auxiliary-reservoir pressure, substantially as set forth.

7. The combination, in a triple-valve device, of a movable abutment, a graduating-valve operated by the abutment, a passage through which fluid under pressure is admitted to one side of the abutment from the train-pipe, and a movable abutment, or piston, by whose movement the passage is put in communication with the auxiliary reservoir, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANÇOIS L. GUILLEMET.

Witnesses:
LOUIS GELY,
DESIRE PERIER.