(No Model.) 2 Sheets—Sheet 1.

F. LANSBERG.

AIR BRAKE.

No. 516,936. Patented Mar. 20, 1894.

Fig. I.

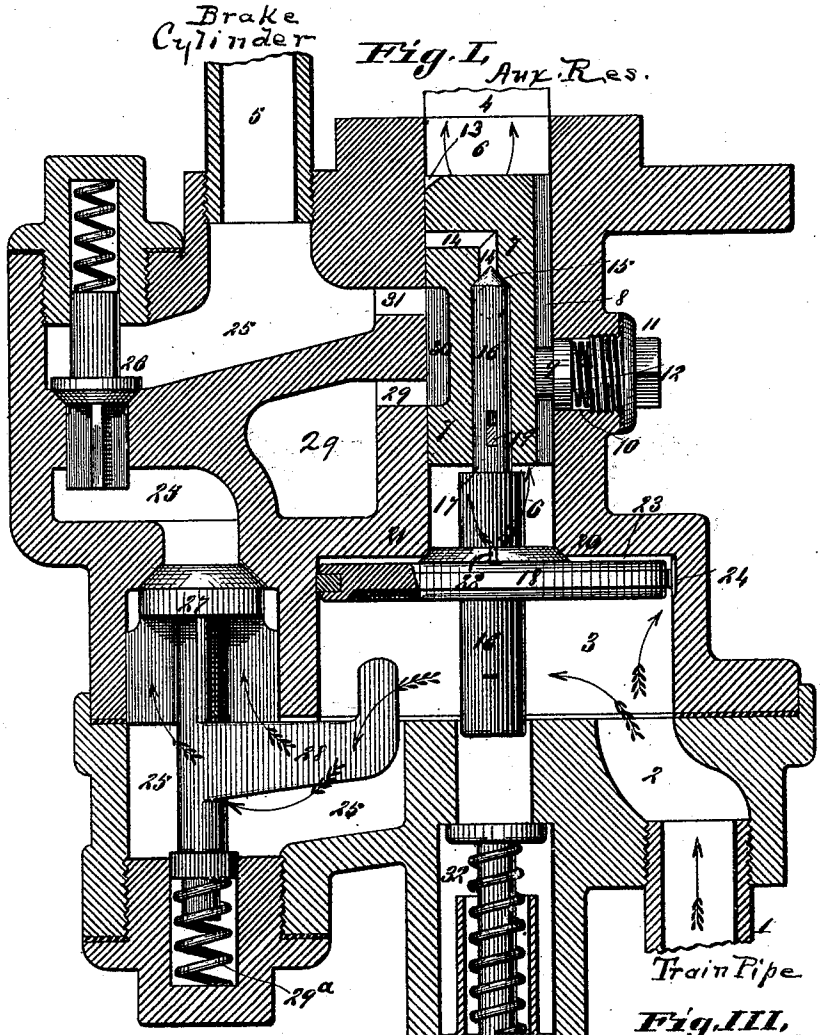


Fig. II.

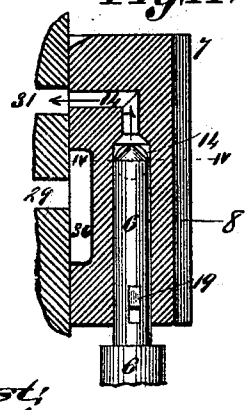


Fig. III.

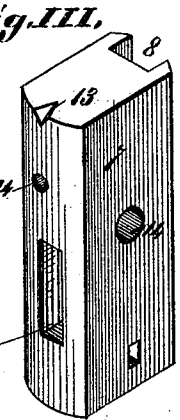
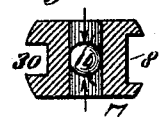


Fig. IV.



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(No Model.) 2 Sheets—Sheet 2.

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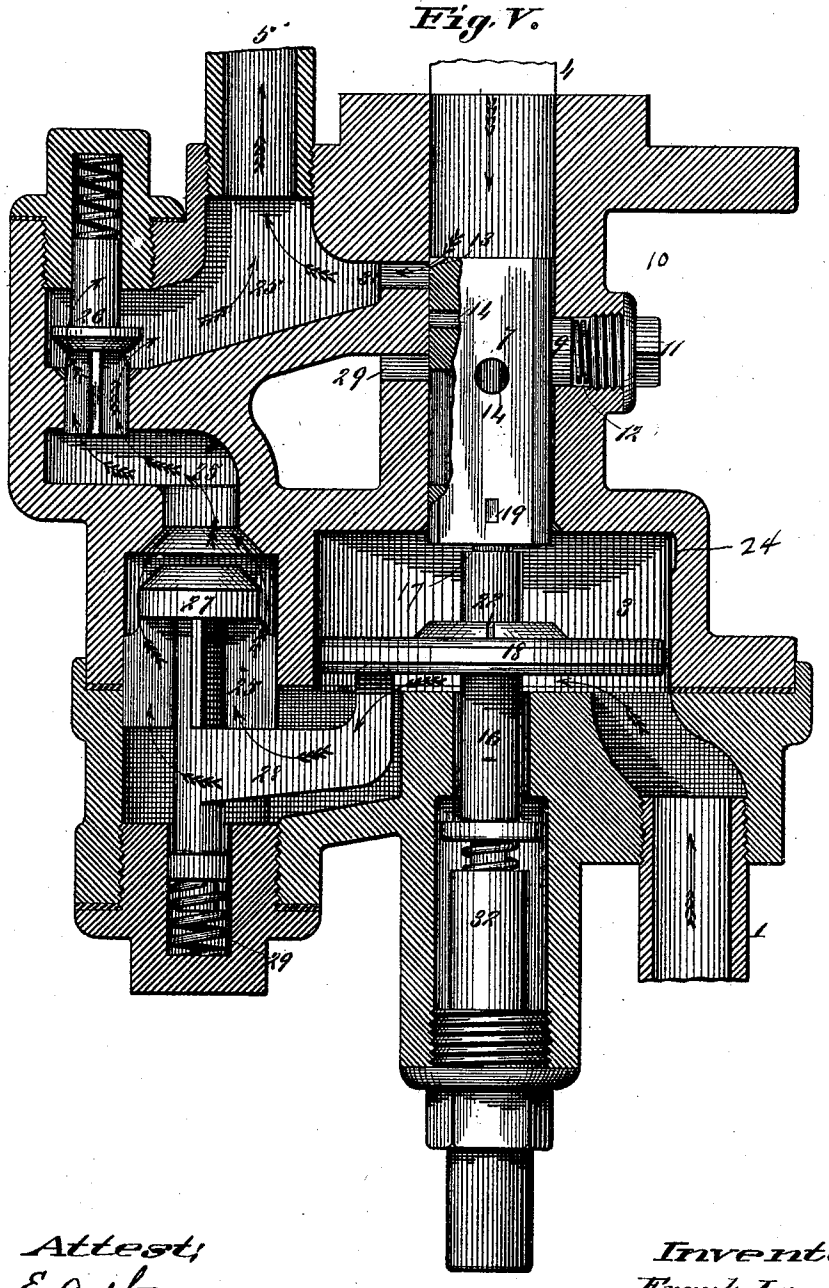
Fig. V.



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UNITED STATES PATENT OFFICE.

FRANK LANSBERG, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE LANSBERG BRAKE COMPANY, OF SAME PLACE.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 516,936, dated March 20, 1894.

Application filed April 26, 1890. Serial No. 349,642. (No model.)

To all whom it may concern:

Be it known that I, FRANK LANSBERG, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Air-Brakes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of air brakes, wherein the air is admitted from the auxiliary reservoir to the brake cylinder, for service stops, and wherein a greater reduction of air in the train pipe than is necessary for service stops, permits an increased pressure of air in the brake cylinder for emergency stops.

My invention consists in features of novelty hereinafter fully described and pointed out in the claim.

Figure I is a vertical section, illustrative of my invention. Fig. II is a detail, vertical section, showing the main slide valve in the position it occupies when air is admitted from the auxiliary reservoir to the brake cylinder for service stops. Fig. III is a perspective view of the valve, and Fig. IV is a transverse section of the valve, taken on line IV—IV, Fig. II. Fig. V is a section showing the parts in the position they occupy when an emergency stop is being made.

Referring to the drawings, 1 represents a portion of the train pipe communicating through a port 2 with the piston valve chamber 3.

4 represents the pipe leading to the auxiliary reservoir, and 5 the pipe leading to the brake cylinder.

6 is a passage leading from the chamber 3 to the pipe 4 of the auxiliary reservoir, and this passage constitutes the slide-valve chamber, in which is located a slide valve 7, preferably of the form shown in Fig. III. The passage 6 is round in cross-section, and the valve being flat on two of its sides, permits the passage of the air from the chamber 3, through the passage 6. The valve 7 is provided with a groove 8 at its back to receive the inner end of a plug 9, by which the valve is held from turning in the passage 6. The plug 9 is held in an opening 10 of the housing by means of a nut or screw-cap 11, between which and the plug a spring 12 is placed, which serves to keep the face of the valve up snugly against the wall of the passage 6. The valve 7 has a notch 13 on the front or face side of its upper end, and it is provided with a port 14 extending from its face in an inwardly direction to about its center, from where it extends in a downwardly direction a short distance, (see Fig. I,) and then in an outwardly direction through the side of the valve. In this port there is a seat 15 to receive the conical upper end of a stem 16, having a shoulder 17 just beneath the valve 7, and below this shoulder the stem has secured to it a piston valve 18, fitting and working in the cylinder 3. The stem 16 is secured to the valve 7 by means of a transverse key 19, but a slight movement of the stem within the valve is permitted by making the opening in the stem through which the key passes, larger than the key, in a vertical direction, or, of course, the opening through the stem might be the same size as the key, and the opening in the valve through which the key passes made larger in a vertical direction than the key.

At the lower end of the passage 6 is a seat 20, against which bears a conical portion 21 on the upper face of the piston-valve 18. This portion 21 of the valve 18 has a notch or groove 22, and by this portion 21 the valve 18 is prevented from coming quite against the upper end or surface of the cylinder, leaving a space 23 between the upper face of the valve 18 and the upper end of the chamber.

24 represents a small groove or port in the upper portion of the side of the cylinder, through which, when the valve is raised, the air passes from the train-pipe into the chamber 23, and escaping through the notch or groove 22 enters the passage 6, and passes to the auxiliary reservoir, as shown by the arrows in Fig. I.

25 represents a passage forming a communication between the chamber 3 and cylinder-pipe 5. In this passage there is located a check-valve 26 and a valve 27 provided with an arm 28, and which valve is held in its normal or seated position by the air pressure from the train pipe. A spring 29^a may be employed to hold the valve 27 to its closed posi-

tion before air is admitted to the train pipe. The arm 28 extends from the stem of the valve 27 into the chamber 3, beneath the piston valve 18.

29 represents an exhaust port communicating with the passage 25, when the valve 7 is in its upper position, by means of a passage 30 in the face of the valve 7, and the live air passage 31, through which the air passes from the auxiliary reservoir to the brake cylinder pipe 5, when the valve 7 descends for service stops.

32 represents a cushion, which may be provided to receive the downward movement of the piston valve 18, by the lower end of the stem 16 coming against it.

The operation is as follows:—Supposing the train to be running, the air in the train pipe will keep the piston valve 18 in its upper position, and the air will pass through the port or groove 24, through the space 23, through the notch or groove 22, and through the port 6, around the valve 7 to the auxiliary reservoir. Now, suppose a service stop is to be made, the air is reduced in the train-pipe, say three pounds to the square inch, and the piston-valve 18 descends, closing the port 24, and moving the valve 7 down with it, as soon as the lost motion of the opening through which the key 19 passes is taken up. The lost motion, just referred to, opens the port 14 as the conical upper end of the stem 16 is removed from its seat 15. As soon as the valve 7 descends far enough for the port 14 to come opposite or register with the port 31, the air passes from the auxiliary reservoir to the brake-cylinder, through the ports 14, 31 and 25, and the pipe 5, to the brake-cylinder, thus applying the brakes. To release the brakes, the air is admitted to the train-pipe again, and the piston-valve, and the valve 7 raised to their normal position, as shown in Fig. I; when the air will exhaust from the brake cylinder through the ports 31, 30, and 29. Now, in case of an emergency stop, the air in the train-pipe is reduced more than is necessary for a service stop, and the piston valve 18 drops, (of course carrying the valve 7 with it, as before,) onto the arm 28, which opens the valve 27, and permits the air to pass directly from the train pipe to the brake cylinder, as shown by the arrows in Fig. V, and by using the notch 13 in the upper end of the valve 7, the air may also pass from the auxiliary reservoir to the brake cylinder. It will be understood, that in making a service stop, the piston valve 18 does not descend far enough to come in contact with the arm 28, and open the valve 27, for the reason that the air in the train pipe is not reduced sufficiently to permit a sufficient descent of the piston valve to allow it to come against the arm 28; but, when an emergency stop is to be made, it can be effected, as stated, by reducing the air in the train pipe sufficiently to allow the piston valve to come in contact with, and move the arm 28, with its valve 27. It will also be understood that the reduction of the air in the train pipe for a service stop will not be sufficient to allow the valve 27 to open so that the valve 27 is held closed by the air from or in the train-pipe until the air is reduced in the train pipe for an emergency stop, as explained. The check valve 26 prevents the escape of air through the passage 25 in a direction away from the brake cylinder pipe 5, during a service stop, but is easily raised or lifted by the air for an emergency stop. In case of the breakage or separation of a train, causing the separation of the train-pipe between the cars, the emergency stop is produced by the piston-valve 18, and the valve 7 being forced by the air in the auxiliary reservoir to their lower position, (there being, of course, no pressure then beneath the piston-valve 18, as the air in the train pipe has escaped,) and a full supply of air from the auxiliary reservoir passes through the port 31 into the passage 25, and to the brake cylinder. By an arrangement of this kind, a cheap and effective means is provided for either a service or an emergency stop.

I claim as my invention—

In an air brake the combination with the train pipe; the brake cylinder and the auxiliary reservoir; of the piston-valve chamber; the slide valve chamber in communication with said piston chamber and auxiliary reservoir and having the exhaust port and a port leading to the brake cylinder; the piston and slide valves in their respective chambers, connected together; the passage 25 communicating with the piston valve chamber and leading directly therefrom to the brake cylinder; a check valve in said passage, the valve 27 having an arm or projection extending into the piston valve chamber, arranged to be closed by pressure from the train pipe and to be opened by the descent of the piston valve upon the said arm or projection, substantially as set forth.

FRANK LANSBERG.

In presence of—
E. S. KNIGHT,
THOS. KNIGHT.