No. 742,386.

PATENTED OCT. 27, 1903.

J. H. BLEOO.

AIR BRAKE.

APPLICATION FILED JUNE 12, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

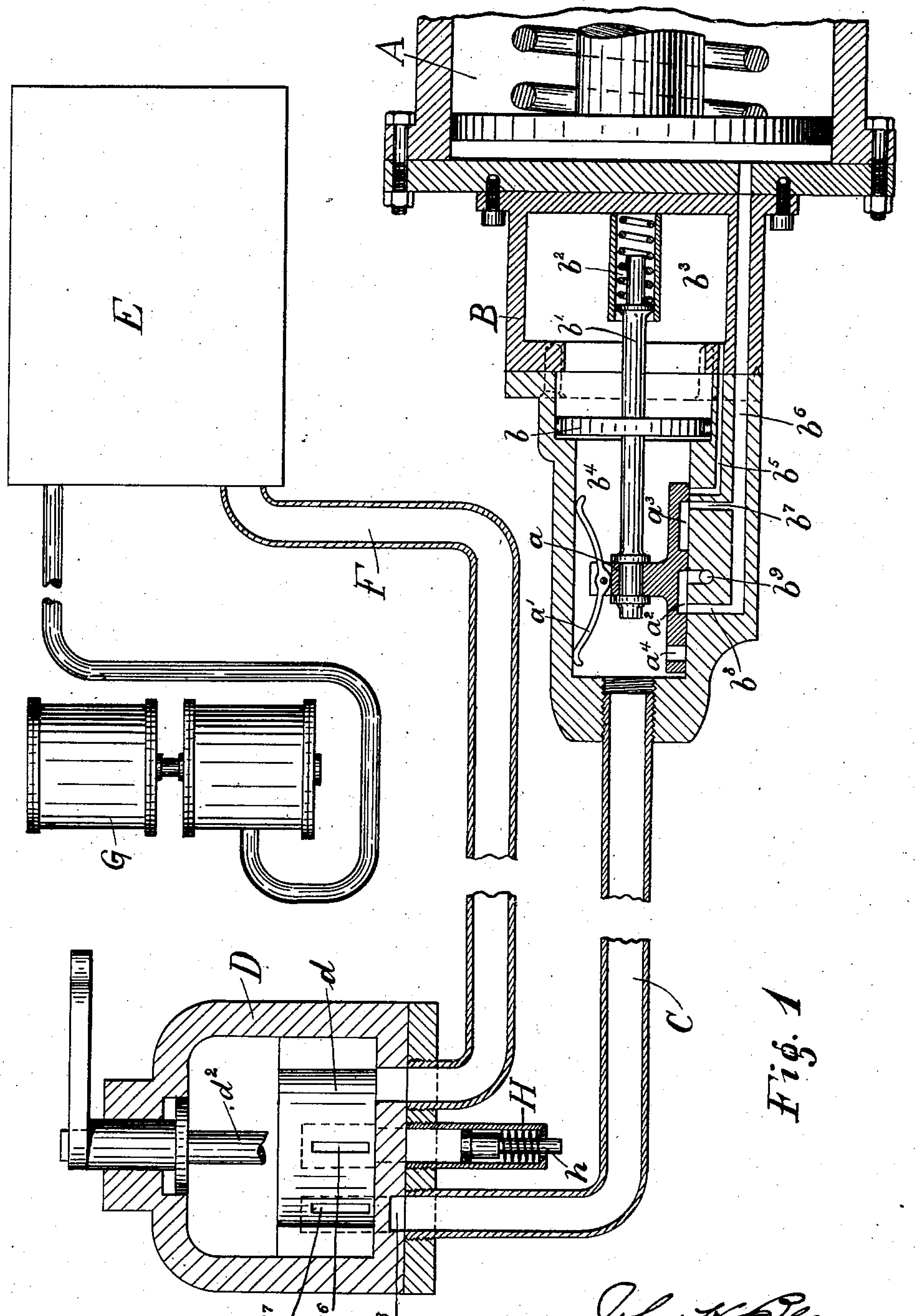

Fig. 1

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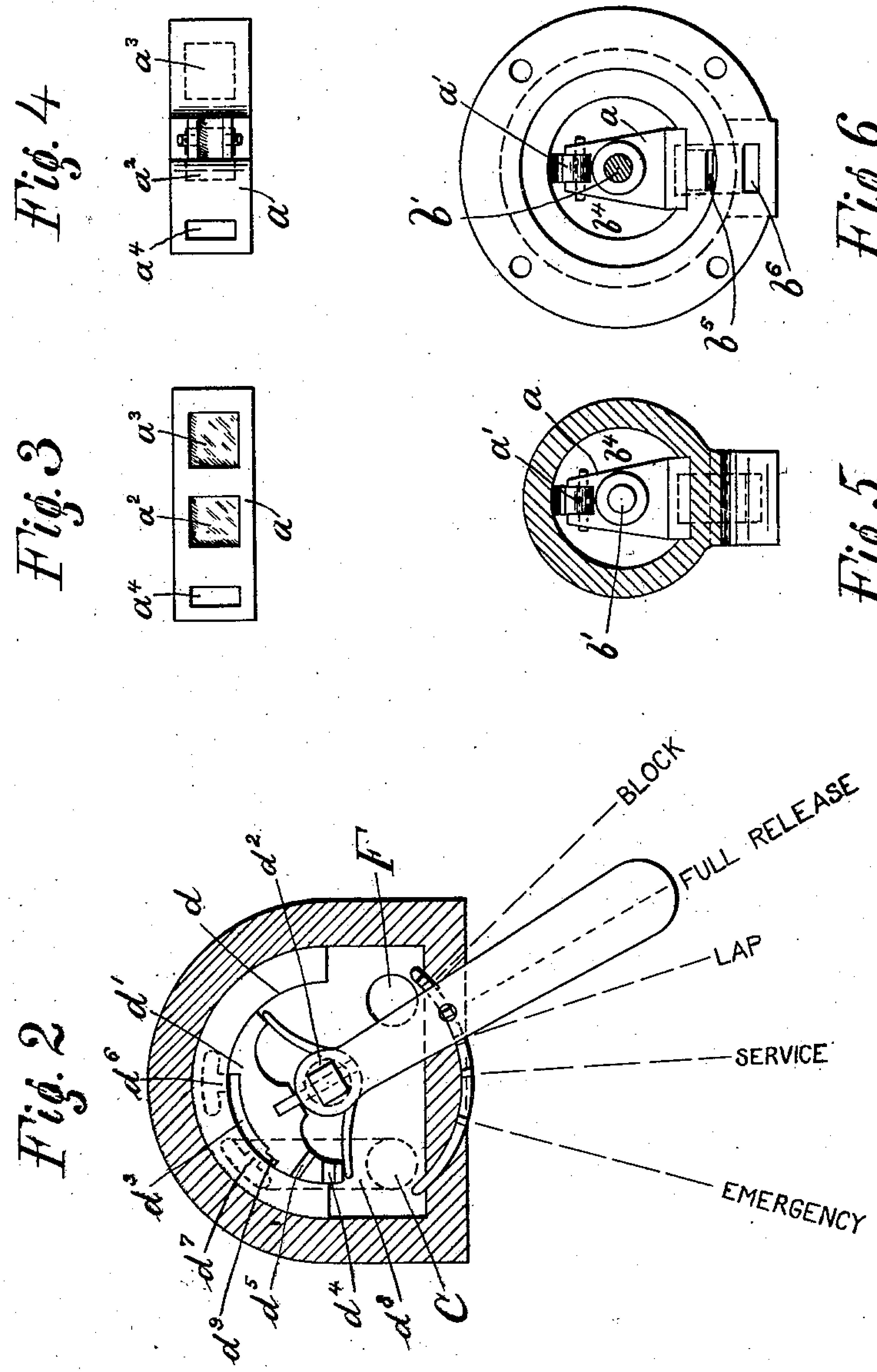

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UNITED STATES PATENT OFFICE.

JOHN H. BLEOO, OF BROOKLYN, NEW YORK, ASSIGNOR TO ABRAHAM B. LEVY, OF NEW YORK, N. Y.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 742,386, dated October 27, 1903.

Application filed June 12, 1902. Serial No. 111,321. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BLEOO, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Air-Brakes, of which the following is a specification.

My invention relates to air-brakes, and has for its particular object to produce an improved air-brake of the straight-air type.

In the accompanying drawings I have illustrated an air-brake system in which my invention is embodied.

The drawings are by way of illustration merely and show one form of the apparatus in which my invention is embodied.

In the drawings, Figure I is a sectional diagrammatic view of the air-brake system in which but a single brake-cylinder has been shown, it being understood, however, that the system is applicable to short trains wherein several brake-cylinders are employed. Fig. II is a sectional plan view of the engineer's valve. Fig. III is a face view of the under face of the slide-valve operated by the triple valve. Fig. IV is a sectional plan view of the slide-valve. Fig. V is an end view of the slide valve looking from the left of Fig. I, and Fig. VI is an end view of the slide-valve looking from the right of Fig. I.

In the drawings, A indicates the brake-cylinder; B, the valve-casing; C, the train-pipe; D, the engineer's valve; E, the reservoir; F, the pipe connecting the engineer's valve with the reservoir, and G any suitable form of air-compressor. The structure contained within the valve-casing B is a combined charge and discharge valve, hereinafter briefly designated as a "governing-valve."

The governing-valve b is provided with a stem b', socketed in a spring-chamber b^2, contained in a chamber b^3 on one side of the governing-valve. A slide-valve chamber b^4 is provided on the opposite side of the governing-valve adapted to receive direct pressure in the train-pipe C. The casing of the slide-valve is provided with an angular passage b^5, communicating with the chamber b^3. A passage b^6 is also provided, which passage communicates between the slide-valve chamber b^4 and the interior of the brake-cylinder A. This passage has two branches, one, b^7, adapted to be put in communication with the passage b^5 by the slide-valve and the other, b^8, adapted to be put in communication with the vent-passage b^9.

The slide-valve a is carried on the valve-stem b' and is held to its seat by a suitable spring a'. This slide-valve is provided with recesses a^2 a^3 and with an aperture a^4. The functions of these various parts will be fully set forth hereinafter.

The engineer's or controlling valve D is shown as in the general shape in horizontal cross-section of the letter D. The interior of the casing receives air from the supply-pipe F. The valve-seat consists of a curved face d, against which a curved-face valve d', carried upon a spindle d^2, is adapted to bear. This valve is provided with a recess d^3, an emergency-port d^4, and a service-port d^5, the valve being shown in the drawings as on the position of full release, the various positions of the valve being legended in the drawings.

The face of the valve-seat is provided with a plurality of ports d^6 d^7. The port d^7 communicates through the valve-casing by the passage d^8 with the train-pipe C, and the passage d^6 communicates with an exhaust port or pipe H, provided with a spring check-valve h, which may be set at the desired pressure.

In addition to the ports heretofore mentioned a graduating-port d^9 is provided, which graduating-port registers with the port d^7 when the handle is in the service position, whereby graduated application may be effected.

The principal results brought about by the construction shown in the drawings are the following: A great factor of safety is provided in that the pressure is never entirely vented from the train-line; but a pressure of at least ten or fifteen pounds is maintained at all times, the discharged air from the brake-cylinders on full or part release reaching the atmosphere at the brake-cylinders and not at the engineer's valve. The system also uses less air than the ordinary straight air by reason of the fact already stated, that even in the release position a pressure of ten or fifteen pounds in the train-line is maintained.

The operation of the construction is as fol-

lows: To make a service application, starting from full release, move the handle of engineer's valve to service stop or notch, air under pressure from reservoir E through pipe F to body of controller D, through small port d^5, which is in register with port d^7 of the rotary slide-valve seat, thence through cored-out passage d^8 to pipe C, and through pipe C to governing-valve B and chamber b^4, moving piston b to the right. Slide-valve a is carried to the right, and in its travel cavity a^2 laps port b^9, and the face of slide-valve a closes port b^8, cavity a^3, laps port b^7 and port and passage b^5, relieving the pressure from chamber b^3 through b^5, cavity a^3, and port b^7 into the brake-cylinder. Continuing its travel until piston strikes the end of its chamber, port a^4 in slide-valve a is in register with port b^8, passage b^6, and brake-cylinder A, and the brakes are set to any pressure to suit the operator. Ports b^9 b^7 b^5 are closed, and straight air flows from reservoir through pipe F, controlling-valve D, pipe C, ports a^4 b^8, and passage b^6 to brake-cylinder. To hold the brakes set, the handle is moved to the lap position, which closes supply-port d^5 and d^7 of the controller. To gradually release the brakes, small cavity d^9 is brought in register with port d^7 and large cavity with port d^6 through pipe H and check-valve h to atmosphere. To make an emergency application, move the handle to emergency stop or notch, which will bring large port d^4 of the rotary slide-valve d' in register with port d^7 in rotary slide-valve seat, admitting a large volume of air to and through cored-out passage d^8 to pipe C and chamber b^4, moving piston b to the right. The slide-valve action is the same as in the graduating application, only somewhat quicker, on account of the great volume of air. To bring the brakes to full release, move the handle to full-release stop or notch, which will move rotary slide-valve to the left and bring large cavity d^8 in register with ports d^7 and d^6, exhausting the air from chamber b^4 through pipe C, cored-out passage d^8, port d^7, cavity d^8, port d^6, and cored-out passage to pipe H, unseating check-valve h to atmosphere until check-valve h is reseated by the force of its spring, which will retain a pressure of about ten pounds in the brake-pipe, (which is indicated on the pressure-gage for the purpose of showing that the brake-pipe is whole and not leaking and for this purpose only.) Piston b has moved to the left and the air from the brake-cylinder has been exhausted through passage b^6, port b^8, cavity a^2, and port b^9 to the atmosphere.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a straight-air or direct-pressure brake system the combination of one or more brake-cylinders operating by straight or direct air pressure, a train-line, a controlling-valve having pressure-retaining means receiving the direct pressure of the straight air and a governing-valve also receiving the direct pressure of the straight air and embodying in its structure means for venting the brake-cylinder in the immediate vicinity of said brake-cylinder, means for operating the governing-valve by reduction in the train-pipe pressure and means also operated by the governing-valve for closing communication between the train-pipe and the brake-cylinder when the brake-cylinder is being vented and thereby maintaining the air-pressure in the train-line.

2. In a straight-air or direct-pressure brake system the combination of one or more brake-cylinders operating by straight or direct air pressure, a train-line controlling-valve receiving the direct pressure of the straight air and a governing-valve also receiving the direct pressure of the straight air and embodying in its structure means for venting the brake-cylinder in the immediate vicinity of said brake-cylinder, a supplemental chamber b^3 with means for venting the said supplemental chamber to the atmosphere at the beginning of the movement of the governing-valve, means for operating the governing-valve by reduction of the train-pipe pressure and means also operated by the said governing-valve for closing communication between the train-pipe and the brake-cylinder when the brake-cylinder is being vented and thereby maintain the air-pressure in the train-line.

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