

No. 702,124.

Patented June 10, 1902.

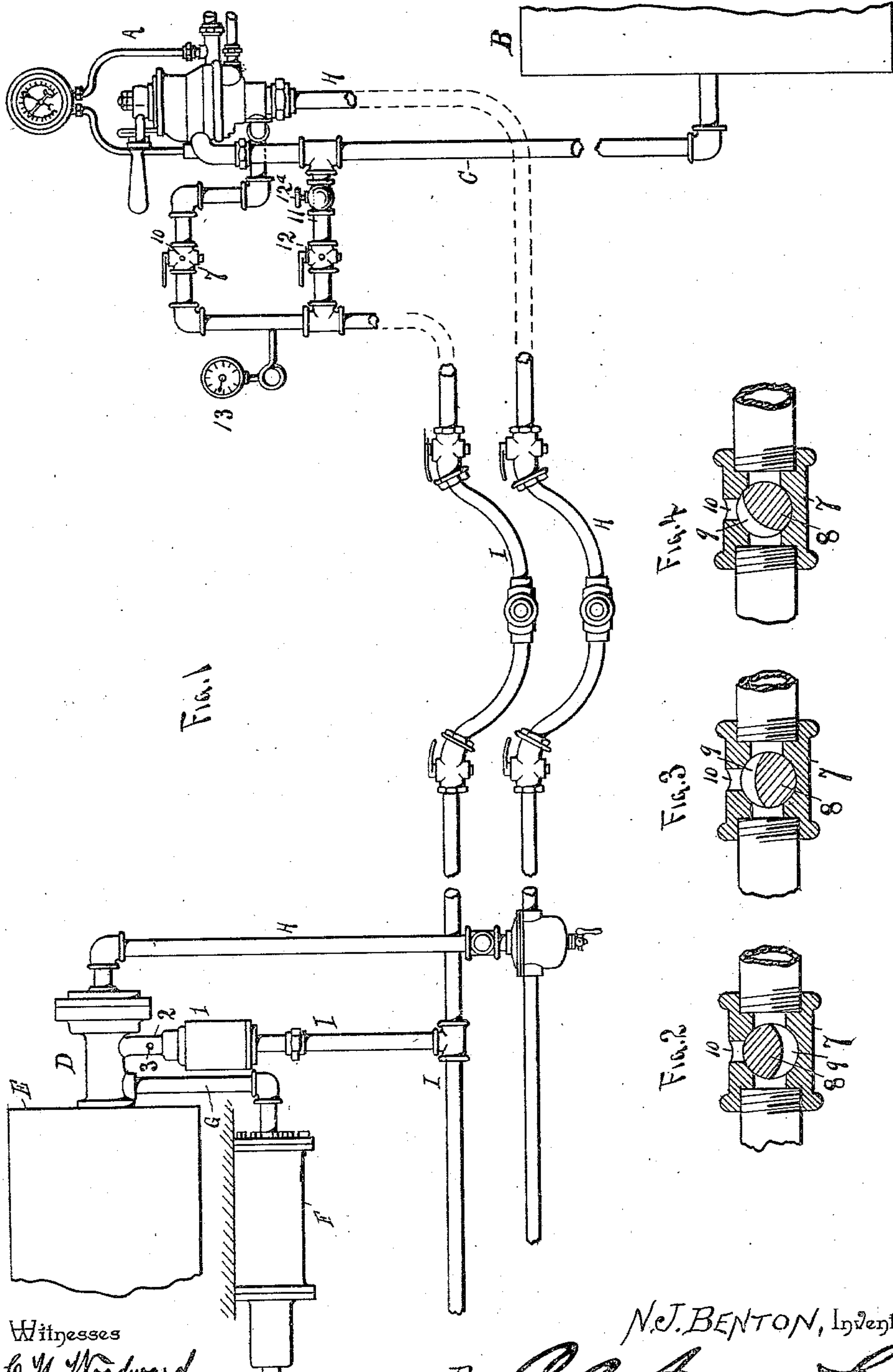
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FLUID PRESSURE BRAKE APPARATUS.

(Application filed May 8, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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J. O. Garner

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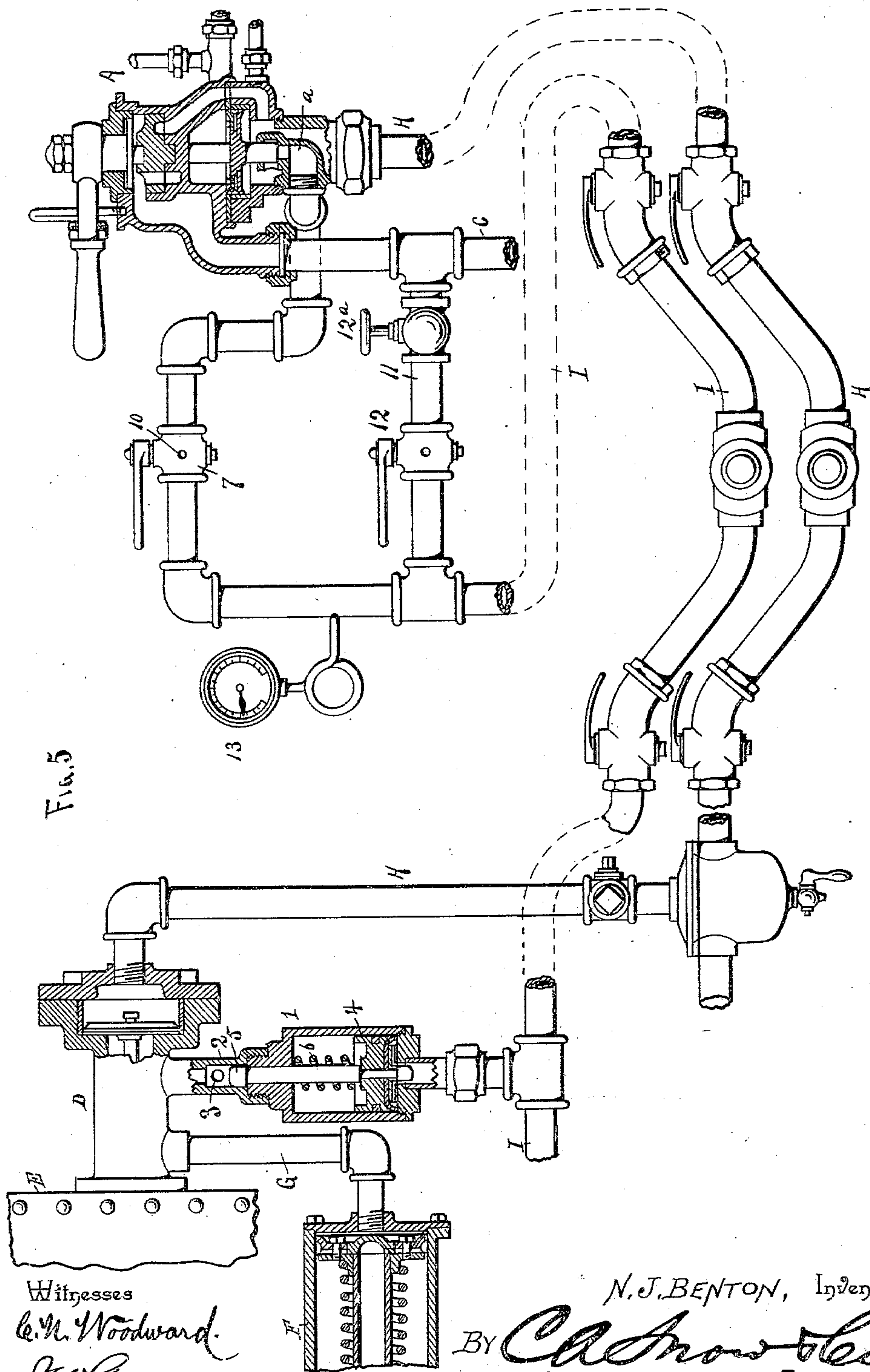
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UNITED STATES PATENT OFFICE.

NATHAN J. BENTON, OF NEW DECATUR, ALABAMA, ASSIGNOR OF ONE-HALF TO WILLIAM P. THOMAS, OF BIRMINGHAM, ALABAMA.

FLUID-PRESSURE BRAKE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 702,124, dated June 10, 1902.

Application filed May 8, 1901. Serial No. 59,306. (No model.)

To all whom it may concern:

Be it known that I, NATHAN J. BENTON, a citizen of the United States, residing at New Decatur, in the county of Morgan and State of Alabama, have invented a new and useful Fluid-Pressure Brake Apparatus, of which the following is a specification.

My invention is an improved fluid-pressure brake apparatus, and relates particularly to an air-retaining valve and its connections; and it consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

The object of my invention is to provide improved devices operated by the engineer in charge of the locomotive whereby he may at will increase or decrease the pressure in the brake-cylinders throughout the train, recharge the train when the brakes are set, and utilize the air which according to the present practice is allowed to escape to the atmosphere from the main train-pipe exhaust-port of the engineer's brake-valve.

In the accompanying drawings, Figure 1 is a diagrammatic elevation of a fluid-pressure brake apparatus embodying my improvements. Figs. 2, 3, and 4 are detail sectional views of a three-way cock which is used in the connection between the engineer's brake-valve and the air-retaining valve. Fig. 5 is an elevation, partly in section, of a fluid-pressure brake apparatus embodying my improvements.

The engineer's brake-valve A, which is of the usual construction, is connected to the main air-reservoir B by the pipe C. The triple valve is of the usual construction and operates in the casing D. E represents the auxiliary reservoir, and F represents the usual brake-cylinder connected thereto through the triple valve by the pipe G. The brake-pipe connections H, which run throughout the train, connect the triple-valve casing with the engineer's-brake-valve in the usual manner.

In the embodiment of my invention I provide a retaining-valve, which I will now describe.

A cylindrical valve-casing 1 is connected at one end directly to the casing of the triple valve by a coupling 2, which is provided with

the brake-valve exhaust-port 3, that discharges into the outer air. In the cylinder or casing 1 operates a piston 4, which carries a valve 5, that operates in the coupling 2 and is adapted to open and close the exhaust-port 3. The said exhaust-port is of suitable size to enable the brake apparatus to operate rapidly. In practice the said exhaust-port is about three-eighths of an inch in diameter instead of one-fourth of an inch in diameter, as has been heretofore the practice. The piston 4 is suitably packed in the cylindrical casing 1, and a spring 6 is disposed on the piston-rod, which operates the valve 5 and bears downward on the piston and normally moves the latter to the position shown in Fig. 5, thereby causing the valve 5 to open the exhaust-port 3. The said parts 1 2 3 4 5 6 constitute my improved retaining-valve. A train-pipe I, including the usual couplings between the cars, leads from the outer end of the cylinder 1 of the retaining-valve to the main train-pipe exhaust-port *a* of the engineer's valve A. In the said train-pipe I near the engineer's brake-valve and within convenient reach of the engineer is a three-way cock 7, the stem 8 of which is provided with a transverse channel 9 and the casing of which is provided with an exhaust-port 10. This three-way cock is shown in its various positions in Figs. 2, 3, and 4. The retaining-valve train-pipe I is connected at a point near the three-way cock 7 to the main reservoir-pipe C by a coupling 11, which includes a suitable reducing-valve 12^a and a valve or cock 12, the latter enabling the connection between the main reservoir and the train-pipe I to be established or cut off at will.

The operation of my invention is as follows: When the brakes are applied, the exhaust passes from the train-line H through the main train-pipe exhaust-port *a* of the engineer's valve into the train-pipe I (the three-way cock 7 being open, as shown in Fig. 2) to the retaining-valve and causes the latter against the tension of the spring 6 to close the triple-valve exhaust-port 3, thus retaining the brakes set until the three-way cock 7 is reversed, as shown in Fig. 3, and the air in the retaining-valve pipe-line I exhausted through the port 10, thus releasing the retain-

ing-valve, when the spring 6 returns the same to its initial position and opens the triple-valve exhaust-port 3 and releases the brakes. In the event that the exhaust from the train-pipe line H is insufficient to operate the retaining-valve the valve 12 is opened to establish communication between the main air-reservoir and the train-pipe line I. It will be understood that the brake apparatus throughout the train may be readily recharged by the engineer from the main air-reservoir while the brakes are set, and hence any increase of pressure in the brake apparatus which may be required may be obtained in an emergency.

When the form of engineer's brake-valve known as the "New York valve" is used in connection with my improved brake apparatus, I connect the pipe-line I directly to the pipe C, which leads from the main air-reservoir.

In the retaining-valve train-pipe I, and preferably at the point shown in the drawings, is a gage 13 for indicating the pressure in the said train-pipe.

Having thus described my invention, I claim—

1. In a fluid-pressure brake apparatus, a triple valve having an exhaust-port 3 that discharges into the outer air, in combination with a spring-pressed retaining-valve to close said port, said retaining-valve normally opening said exhaust-port, and fluid-pressure connections to operate said retaining-valve and cause the same to close said exhaust-port when the brakes are set, substantially as described.

2. In a fluid-pressure brake apparatus, the combination with a triple valve having an exhaust-port 3 that discharges into the outer air, of a spring-pressed retaining-valve to close said port, an engineer's brake-valve, a

train-pipe line between said triple valve and said engineer's brake-valve, a train-pipe line between the main train-pipe exhaust-port of the engineer's brake-valve and said retaining-valve, whereby the latter can be operated by the exhaust from the engineer's valve, and a three-way cock in said retaining-valve pipe-line, substantially as described.

3. In a fluid-pressure brake apparatus, the combination of a triple valve having an exhaust-port 3, a fluid-pressure-operated retaining-valve to close said port, said valve being normally open, an engineer's brake-valve, a brake-pipe line between said valve and the triple valve, a train-pipe line between said retaining-valve and the main train-pipe exhaust-port of the engineer's valve, a three-way cock in said retaining-valve pipe-line, and a connection, including a cut-off valve, between said retaining-valve pipe-line and the main air-reservoir, substantially as described.

4. In a fluid-pressure brake apparatus, the combination of a triple valve having an exhaust-port that discharges into the outer air, a normally open fluid-pressure-operated retaining-valve to close said exhaust-port, a brake-pipe line leading from said triple valve, a train-pipe line communicating with said retaining-valve, to operate and close the same, means to exhaust from said retaining-valve pipe-line and means to utilize exhaust from the brake-line, to operate said retaining-valve, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

NATHAN J. BENTON.

Witnesses:

W. C. JACKSON,
B. M. ZETTLER.