(No Model.)

2 Sheets—Sheet 1.

H. G. MANNING.

FLUID PRESSURE VALVE.

No. 492,372. Patented Feb. 21, 1893.

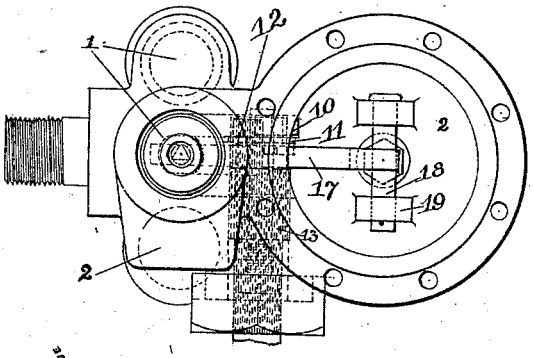

Fig. 2.

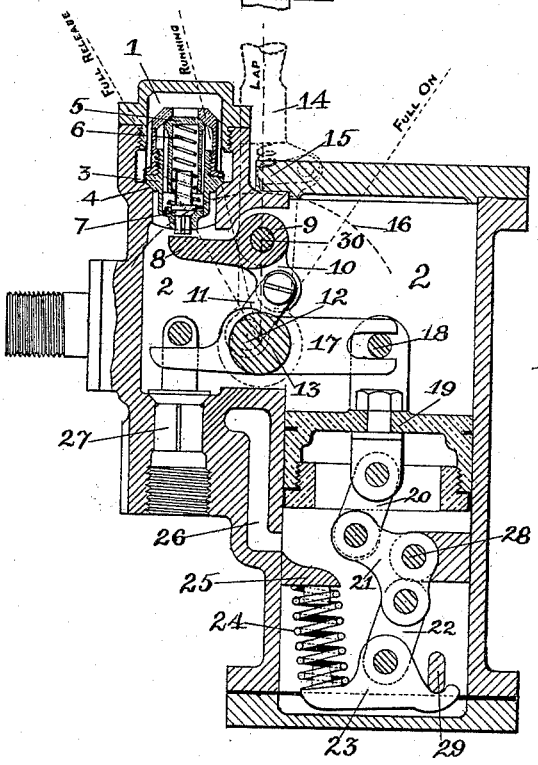

Fig. 1.

WITNESSES:

Leslie E. Howard.

Edward Hawkins

INVENTOR

Harry G. Manning.

(No Model.) 2 Sheets—Sheet 2.

H. G. MANNING.

FLUID PRESSURE VALVE.

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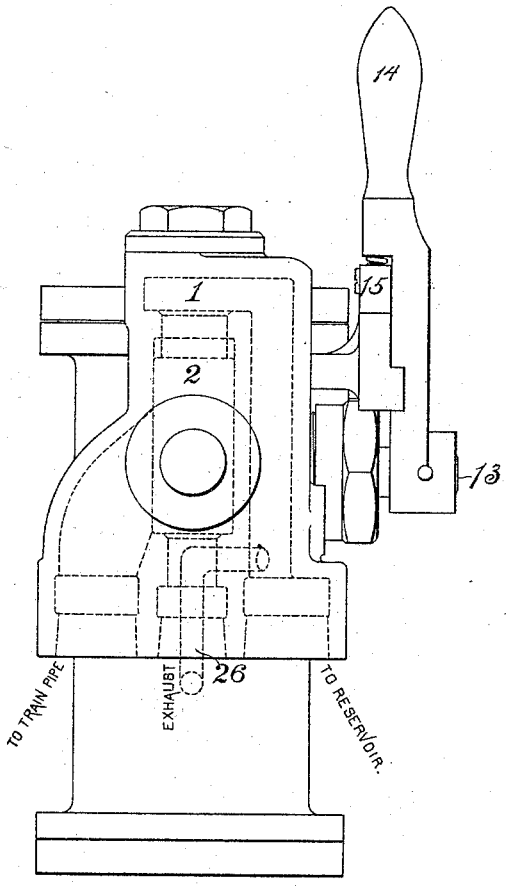

FIG. 3.

WITNESSES:
A. V. Massey
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INVENTOR
Harry G. Manning.

UNITED STATES PATENT OFFICE.

HARRY G. MANNING, OF WATERTOWN, NEW YORK.

FLUID-PRESSURE VALVE.

SPECIFICATION forming part of Letters Patent No. 492,372, dated February 21, 1893.

Application filed April 6, 1892. Serial No. 428,101. (No model.)

To all whom it may concern:

Be it known that I, HARRY G. MANNING, a citizen of the United States, and a resident of Watertown, in the county of Jefferson and State of New York, have invented a new and useful Improvement in Fluid-Pressure Valves, of which the following is a specification.

My invention relates to improvements in fluid pressure valves, particularly to excess pressure valves in what is commonly known as the engineer's valve as used with compressed air train brakes and which is used for applying and releasing the brakes.

Figure 1 is a section of such a valve showing my improvement. Fig. 2 is a plan of same. Fig. 3 is an end view showing by dotted lines the connections between the reservoir and the top of the valve case; and between the train pipe and the interior of the valve case 2.

In Fig. 1 the space 1 has direct communication with the main air supply, commonly called the main reservoir. Space 2 is in direct communication with the pipe leading to train. The main feed valve 3 which has its seat at 4 has within it excess valve 5 seating against top cap of 3, excess valve 5 being held to its seat by spring 6 of such a tension as to hold excess valve 5 to its seat until a pressure of about twenty pounds in main reservoir unseats it allowing air to flow into interior of main feed valve 3. Main valve 3 has also within it running position valve 7, which when lifted from its seat by toe of arm 8 of bell crank lever 9 allows air to flow from interior of main feed valve 3 to train pipe space 2. The arm 10 of bell crank lever 9 is connected by link 11 to pin 12, which is eccentrically attached to shaft 13. Shaft 13 has rigidly connected to it handle 14 to which is attached a swinging dog 15 adapted to catch in notches in quadrant 16. Lever 17 is pivoted on eccentric pin 12 and has a sliding fulcrum connection on pin 18, which is rigidly connected with piston 19, said piston 19 being connected through link 20, bell crank 21, (pivoted on pin 28) link 22 and lever 23 pivoted at 29 to spring 24 which is hung on projection 25 attached to body of valve. The angle between the arms of the bell crank 21 is so proportioned that the resistance of the spring 24 to upward motion of the piston 19 increases in proportion to the distance traveled by the piston. When therefore the pressure is reduced on the upper side of the piston, the pressure below will move the piston upward until the resistance of the spring is equal to the difference in pressure upon the opposite sides of the piston. Main reservoir pressure is constantly on the under side of piston 19, the space below piston 19 having communication with space 1 through port 26 which in the complete mechanism extends upward to space 1 through the portion of the casing that is removed to show the section. Piston 19 is provided with suitable packing to prevent the flow of main reservoir pressure from under side of piston to upper side or into train-pipe space 2. Exhaust valve 27 controls an opening from the train pipe to the atmosphere.

The operation of such a valve is as follows: When the air pump or compressor is started, air flows from main reservoir into space 1, and from space 1 through port 26 to under side of piston 19, and when handle 14 is in lap position, as shown in Fig. 1, main feed valve 3, "excess" valve 5 and "running position valve" 7 are all seated, together with exhaust valve 27. When pressure in main reservoir reaches about twenty pounds, as in common air brake practice "excess valve" 5 opens and the interior of the casing which forms main feed valve is filled with air which holds running position valve 7 to its seat. As the pressure in main reservoir rises, the pressure in interior of feed valve 3 is kept about twenty pounds lower than the main reservoir pressure. Feed valve 3 is much larger than running position valve 7 and is kept on its seat 4 by the difference in fluid pressure between the reservoir and train-pipe. The lower wings of valve 7 project below the lower extension of valve 3, so that arm 8 may lift valve 7 a short distance without lifting valve 3. A movement of handle 14 to running position causes toe 8 of bell-crank lever 9 to lift valve 7 without raising valve 3, allowing pressure to feed through valve 7 into train-pipe. When handle 14 is put in "full release" position, valve 3 is lifted from its seat by toe 8 of lever 9, making a comparatively large opening from main reservoir, for the purpose of charg-

ing train-pipe quickly. When handle 14 is brought in any position between "lap" and "full on" positions, valve 27 is lifted from its seat and air exhausted from train-pipe to the atmosphere. When pressure in train-pipe falls below pressure in main reservoir, valve 27 is automatically closed by upward movement of piston 19 and lever 17 pivoted on eccentric pin 12 because the reduction of pressure above the piston 19 allows the piston to rise and raise the right hand end of lever 17.

I am aware that engineers' valves have been constructed with automatic exhaust valve closure, substantially as shown in my drawings, but my improvement consists of the main feed valve containing an excess pressure device, and also means for admitting air to train-pipe through an opening smaller than that made by the main feed valve.

The drawings show my device as applied to an engineer's valve having an automatic exhaust closure, as described in Patent No. 426,507, granted to Albert P. Massey April 29, 1890.

Having thus described my invention, what I claim is—

1. In an engineer's brake-valve a main feed valve between the main reservoir and the train-pipe composed of a casing containing a running position feed valve 7 controlling an opening from the interior of the casing through the main valve 3 to the train-pipe, and an excess pressure valve 5 controlling an opening from the main reservoir to the interior of said casing and a spring of predetermined tension to hold said excess pressure valve to its seat, combined with suitable means for opening the running position feed valve 7 with a slight motion and opening the main feed valve 3 with a further motion, substantially as set forth.

2. The combination in an engineer's valve for fluid pressure brakes of a main feed valve 3, controlling an opening between the main reservoir and the train pipe, containing within itself an excess pressure valve 5 and a running position feed valve 7; an exhaust valve 27, located between the train pipe and the atmosphere, and means for operating either the feed valves or the exhaust valve by opposite motions of the same handle.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 28th day of March, 1892.

HARRY G. MANNING.

Witnesses:
LESLIE E. HOWARD,
EDWARD HANKIN.