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No. 775,250.

PATENTED NOV. 15, 1904

F. L. ROBINSON.
RELIEF VALVE FOR LOCOMOTIVE CYLINDERS.

APPLICATION FILED APR. 28, 1904.

NO MODEL.

Fig 1

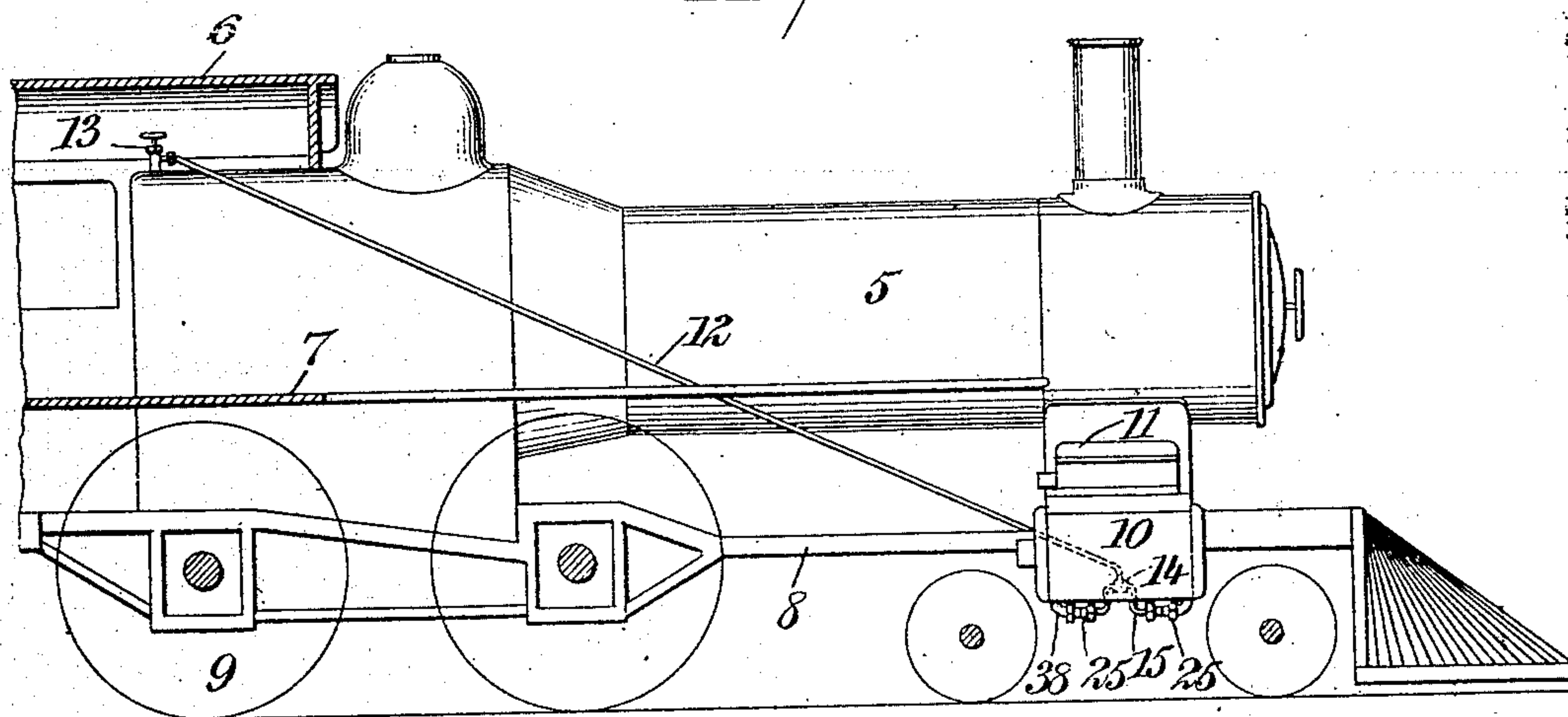
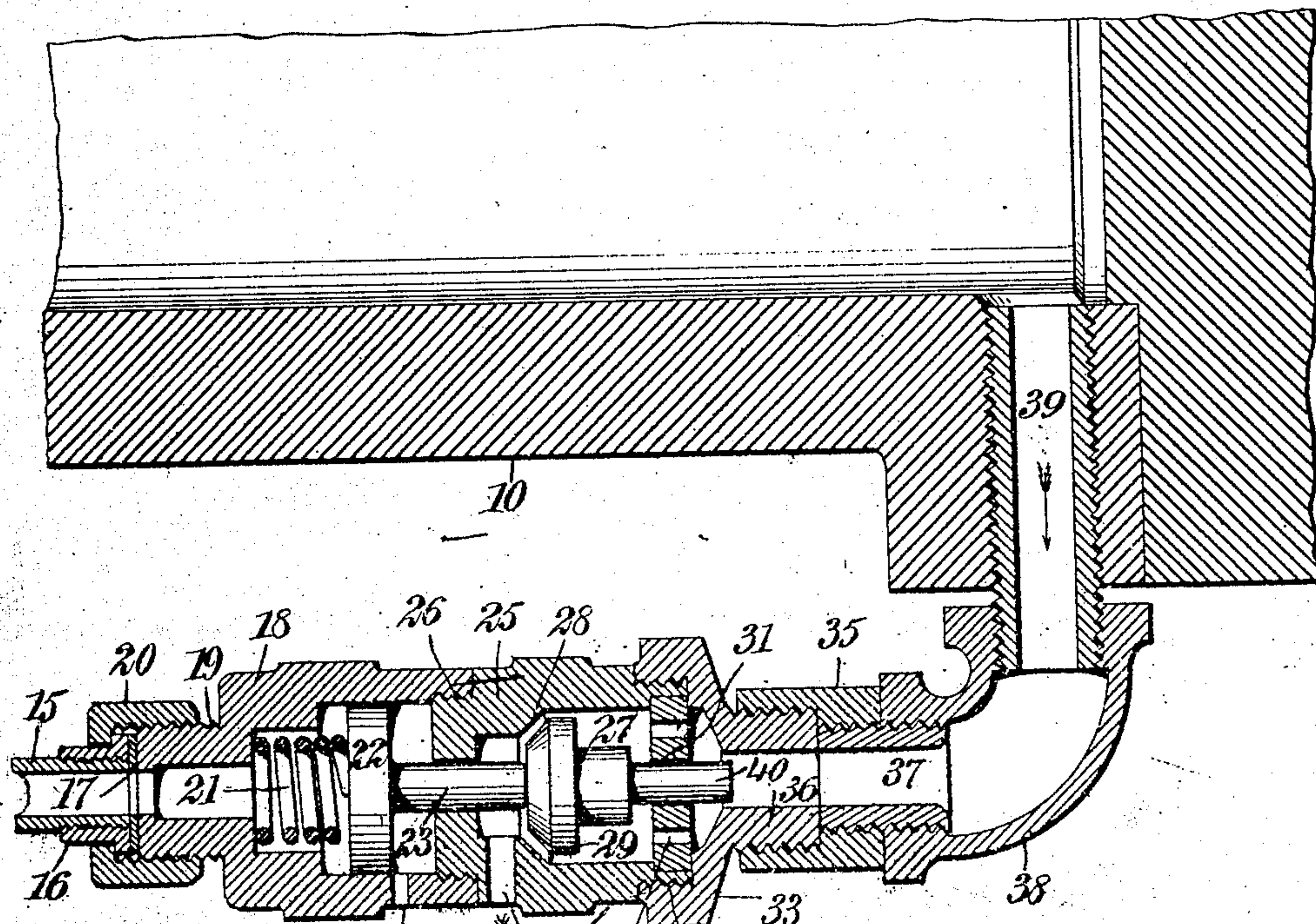


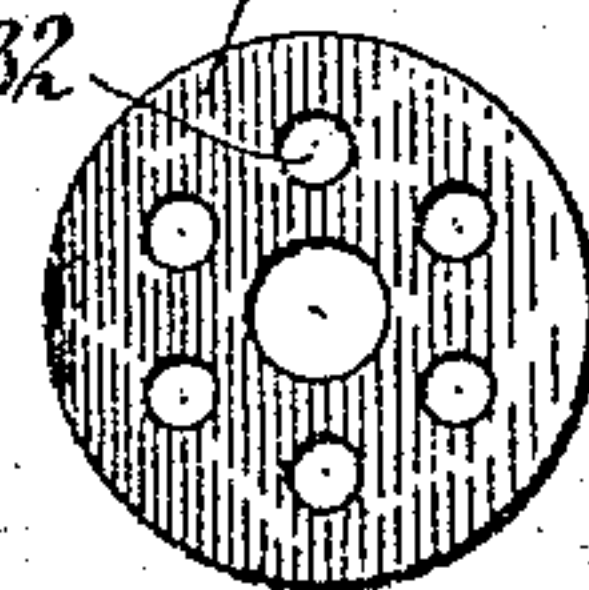
Fig 2



WITNESSES:

H. Walker
W. Harrison

Fig 3



INVENTOR

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BY

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UNITED STATES PATENT OFFICE.

FREDERIC LOUIS ROBINSON, OF CHEYENNE, WYOMING.

RELIEF-VALVE FOR LOCOMOTIVE-CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 775,250, dated November 15, 1904.

Application filed April 28, 1904. Serial No. 205,289. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC LOUIS ROBINSON, a citizen of the United States, and a resident of Cheyenne, in the county of Laramie and State of Wyoming, have invented a new and Improved Relief-Valve for Locomotive-Cylinders and the Like, of which the following is a full, clear, and exact description.

My invention relates to relief-valves, and more particularly to a type of such valve suitable for use upon locomotives to enable the engineer to vent cylinders at will and also to remove the water of condensation as fast as formed while the engine is not in motion.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, partly in section, of a locomotive equipped with my invention. Fig. 2 is an enlarged vertical section of the improved valve and its immediate connections. Fig. 3 is a front elevation of the strainer employed as a part of the valve mechanism.

The locomotive-boiler is shown at 5, the cab at 6, the running-board at 7, the frame at 8, and the wheels at 9, these parts being of the usual construction.

The cylinder is shown at 10, the steam-chest at 11, a steam-tube at 12 for actuating my improved valve, and a hand-valve at 13 for controlling the inflow of steam from the boiler to the steam-tube. At the lower end of the steam-tube is a T 14, provided with pipes 15. Each pipe 15 is fitted with a collar 16, which engages a washer 17. A casing 18 is provided with a threaded portion 19, encircled by an annular cap 20, this cap loosely fitting around the collar 16, so as to allow for expansion and contraction of the metals. Within the casing 18 is a spiral spring 21, engaging a steam-piston 22, provided with a stem 23, rigidly connected thereto. The casing 18 is further provided with a vent 24. Another casing, 25, is connected by a thread 26 with the casing 18 and is provided with a chamber 27, having a valve-seat 28, which is adapted to be closed by a valve 29, provided with a stem 40.

The strainer is shown at 31 and is provided with holes 32, arranged in a circle around the stem 40.

A collar 33 is fitted upon the casing 25 by means of a thread 34 and is provided with a threaded neck 36, upon which is fitted another collar, 35. A tube 37 engages the collar 35 and is connected with a bend 38, secured upon the lower part of a tube 39, forming an outlet for the cylinder 10.

The tension of the spring 21 normally forces the piston 22 to the right as the parts are seen in Fig. 2. The stem 23 presses the valve 29 to the right and away from its seat 28, so that any moisture may readily follow the course of the arrow shown in Fig. 2 and make its escape through the vent 30.

If the engine is at a state of rest, consequently no steam is entering or leaving the cylinders and the vent 30 is always open by virtue of the valve 29 being moved from its seat 28. This allows a free escape of the water of condensation. The instant that steam-pressure is applied, however, the valve 29 closes against its seat 28, thereby compressing the spring 21. Each valve 29 therefore opens and closes each time the cylinder is alternately relieved of pressure and subjected thereto. If now the steam-pressure is on the cylinder, and consequently the valve 29 is closed, the engineer may open the same by merely turning steam through the tube 12 to the T 14 by opening the hand-valve 13. The steam thus admitted presses directly against the piston 22, causing the stem 23 to force the valve 29 away from its seat, so as to allow a part of the steam under pressure of the cylinder to escape through the vent 30. The valve 29 is therefore automatic to the extent that it will always remove the water of condensation when the engine is idle, but is nevertheless under the direct control of the operator from his position in the cab. Moreover, the valve is operated with great ease, because the piston 22 being of greater diameter than the valve 29 enables the valve to be opened quickly and with a powerful stroke by the mere application of the steam. It is necessary that the steam area of the steam-piston 22 be greater

than the variable diameter of the valve 29 in order that the steam may be more than balanced against itself; otherwise it could not move the valve 29 contrary to the tension of the steam. By thus forcing the valve 29 it can be made of considerable size and caused to operate with greater ease than would be the case if it were actuated directly by the manual control of the engineer.

10 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a balanced valve for locomotive-cylinders and the like, the combination of a hollow member connected with the cylinder of a locomotive, said hollow member being provided with a vent and with a valve-seat, a valve disposed within said hollow member and adapted to engage said valve-seat, a steam-piston disposed within said hollow member, and
20 means controllable at will for applying steam-pressure within said steam-cylinder for the

purpose of causing said piston to move said valve from said valve-seat.

2. A balanced valve for locomotive-cylinders and the like, comprising a hollow member provided with a valve-seat and with a vent, a strainer disposed within said hollow member, a valve provided with a portion for engaging said valve-seat and with a stem engaging said strainer, a steam-piston provided with a member for engaging said valve, and means
30 controllable at the will of the operator for applying a steam-pressure against said steam-piston.

In testimony whereof I have signed my name
35 to this specification in the presence of two subscribing witnesses.

FRED. LOUIS ROBINSON.

Witnesses:

W. P. MILES,
L. G. SIMON.