No. 737,446. PATENTED AUG. 25, 1903.

F. McCARTHY.

EXHAUST RELIEF VALVE.

APPLICATION FILED MAY 20, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

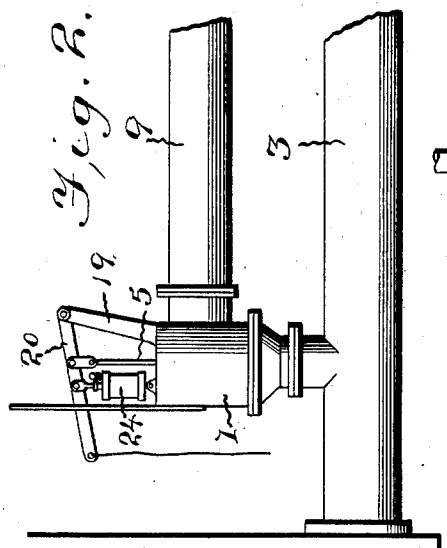


Fig. 3.

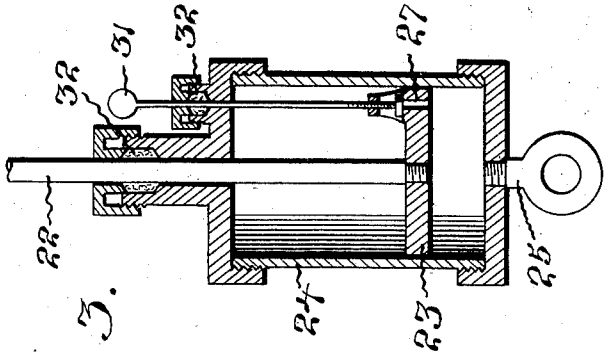


Fig. 4.

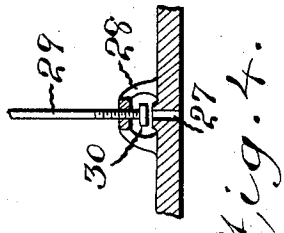
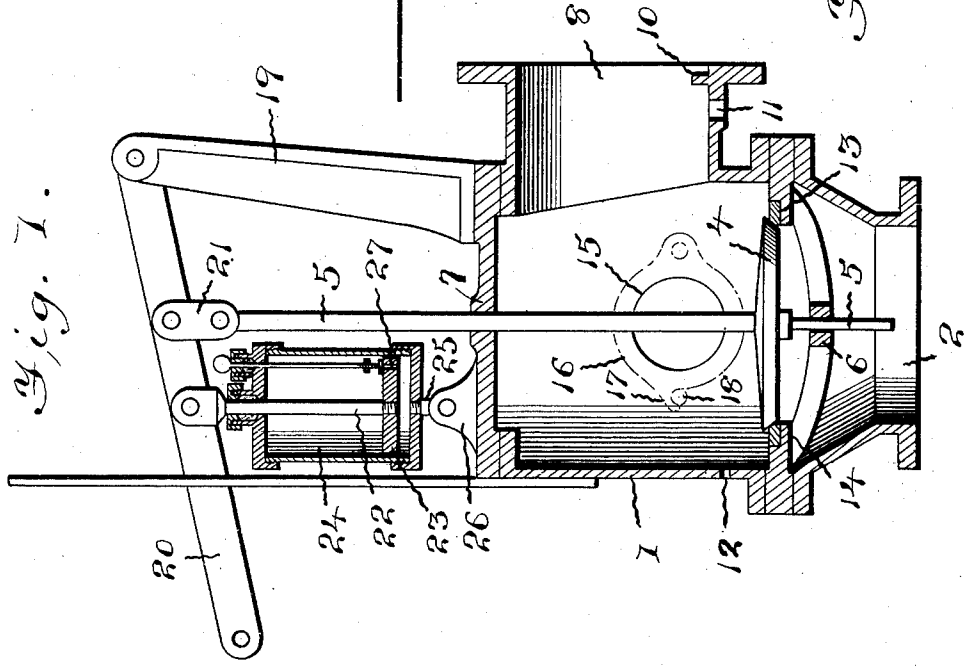


Fig. 1.



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No. 737,446. PATENTED AUG. 25, 1903.

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EXHAUST RELIEF VALVE.

APPLICATION FILED MAY 20, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

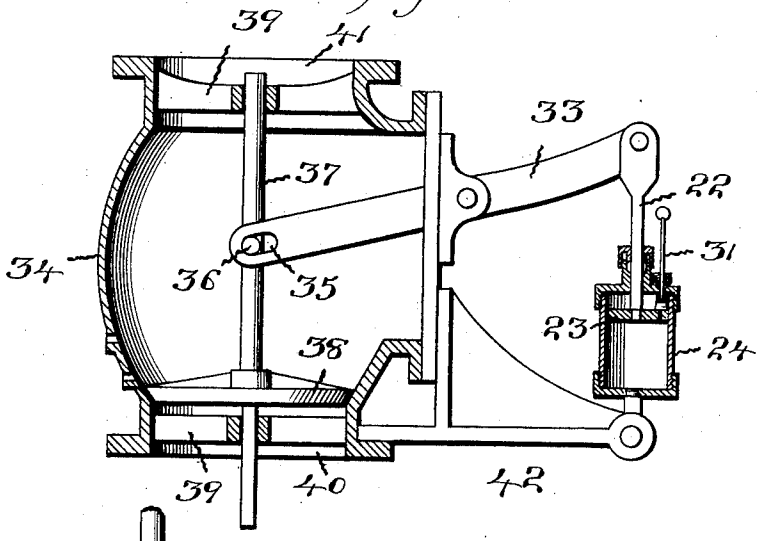
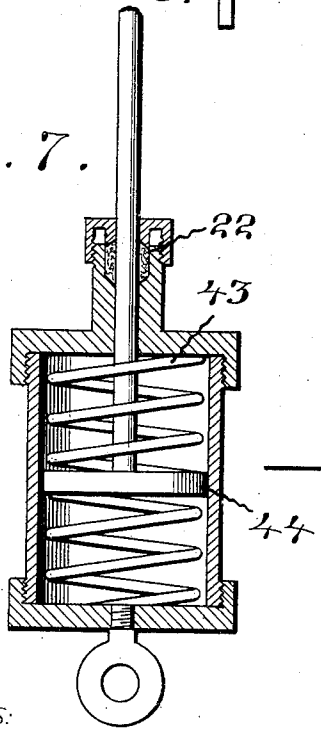


Fig. 7.



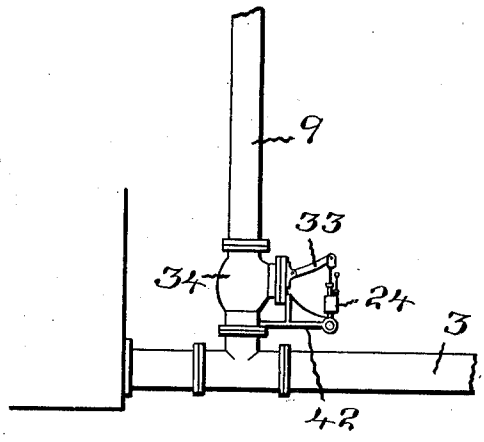


Fig. 6.

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No. 737,446. Patented August 25, 1903.

UNITED STATES PATENT OFFICE.

FELIX McCARTHY, OF POTTSTOWN, PENNSYLVANIA.

EXHAUST RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 737,446, dated August 25, 1903.

Application filed May 20, 1903. Serial No. 158,052. (No model.)

To all whom it may concern:

Be it known that I, FELIX McCARTHY, a citizen of the United States, residing at Pottstown, in the county of Montgomery and State of Pennsylvania, have invented new and useful Improvements in Exhaust Relief-Valves, of which the following is a specification.

My invention relates to new and useful improvements in exhaust relief-valves for condensing-engines.

As is well known a vacuum is formed within the exhaust-pipe extending to a condenser, and this causes the exhaust relief-valve to be normally seated. If, however, for any reason the vacuum is lost or the condenser gets out of order, the exhaust relief-valve automatically opens to allow the steam to exhaust into the atmosphere. One of the great difficulties heretofore experienced in the use of valves of this character has been the hammering of the valve when opened, thereby soon destroying its usefulness. Another disadvantage incident to the use of exhaust relief-valves has been the difficulty with which leakage of the valve could be stopped.

The objects of my invention are to overcome these objectionable features by providing a valve which is connected, by means of a lever, to a cylinder having means therein whereby the opening and closing of the valve may be regulated so as to prevent pounding thereof.

Another object is to employ a valve-casing having a water seal therein and over the valve.

A further object is to provide the casing with a hand-hole which can be opened for the purpose of cleaning the interior of the valve or for placing black lead, flour, or other suitable material upon the valve when it is desired to stop a leak therein.

With the above and other objects in view the invention consists in the novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a vertical section through an angle exhaust relief-valve constructed in accordance with my invention. Fig. 2 is an elevation showing its position in relation to the exhaust of an engine. Fig. 3 is a enlarged section through the valve-controlling cylinder. Fig. 4 is an enlarged section of the piston-valve, said valve being shown open. Fig. 5 is a vertical section through a straightway valve. Fig. 6 is an elevation showing the position thereof in relation to the exhaust of an engine, and Fig. 7 is an enlarged section through a modified form of valve-controlling cylinder.

Referring to the figures by numerals of reference, 1 is the casing of an angle-valve, having an inlet 2, which is adapted to be connected to the exhaust-pipe 3 of an engine, extending to a suitable condenser. (Not shown.) This inlet 2 is normally closed by a valve 4, the stem 5 of which is mounted within cross-arms 6 and within the top or head 7 of the valve-casing. The outlet 8 of the valve is connected to a pipe 9, which permits the free exhaust from the engine, and within this outlet is arranged a dam 10, in rear of which is located a water-outlet 11. The water-inlet 12 is located within the casing at a point above the valve 4, but below the outlet 11, and water upon being admitted through this inlet 12 forms a seal upon the valve 4. Suitable packing 13 may be arranged within the valve-seat 14 for forming a tight joint. A hand-hole 15 is formed in one side of the casing and is normally closed by a plate 16 (shown in dotted lines, Fig. 1) and pivoted at one end to the casing and having a hook 17 at its other end, which is adapted to be supported by a pin 18.

A standard 19 is arranged upon the head 7, and pivoted thereto is a lever 20, which is connected, by means of a link 21, with the upper end of the valve-stem 5. This lever is also pivotally connected to the rod 22 of a piston 23, which is arranged within a cylinder 24, having an eyebolt 25 projecting from its lower end and pivoted within an ear 26 upon the head 7. The piston 23 has a passage 27 therethrough, over which extends a bracket 28. A screw-threaded rod 29 is arranged within this bracket and has a head 30, which is adapted to close the passage 27 when the rod 29 is screwed downward in bracket 28. This rod projects through one end of the cylinder 24 and has a knob 31 or other suitable device whereby the same may be readily turned by hand. Glands 32 are provided for the rods 22 and 29, so as to prevent leakage.

The cylinder 24 is adapted to be filled with oil, and the head 30 is normally removed from the passage 27, so as to permit the oil to flow therethrough in desired quantities. Should the vacuum in the pipe 3 be lost for any reason, the valve 4 is thrown upward and in most cases pounds within its casing. By providing the cylinder 24 and the piston 23, however, the upward movement of the valve is retarded by the oil located between the piston and the upper ends of the cylinder, and therefore the speed of the opening valve 4 will be in proportion to the rapidity with which the oil flows through the piston 30 into the lower portion of its cylinder. When the vacuum is reestablished in pipe 3, valve 4 will be automatically returned to its seat, this downward movement being also controlled by the piston 23. It will of course be obvious that the movement of the valve will be regulated by the distance to which the head 30 is removed from the end of passage 27. By providing a water inlet and outlet in the valve-casing a seal is formed upon the valve which tends to prevent the loss of the vacuum within the pipe 3. Should leakage occur in the valve, it is merely necessary to open the hand-hole 15 and throw black lead, flour, or similar material upon the water. This will be carried downward by the water into the opening in the valve, and the leak will therefore be stopped temporarily. The dam 10 will, as is obvious, prevent the water constituting the seal from flowing into the free exhaust-pipe.

In Figs. 5 and 6 I have shown my improvements applied to a straightway valve. The parts are arranged in substantially the same manner as hereinbefore described. The lever 33, however, is pivoted in one side of the casing 34 and extends thereinto, its inner end being slotted, as at 35, for the reception of a pin 36, extending laterally from the stem 37 of a valve 38. This valve-stem is slidable within cross-arms 39, formed in the inlet and outlet 40 and 41, respectively, of the valve. A bracket 42 is secured to one side of the casing, and the cylinder 24 is connected thereto in the manner hereinbefore described. The rod 22 of the piston 23 is also pivoted to the lever 33, as hereinbefore set forth. It will be understood that in lieu of using oil within the cylinder 24 coil-springs 43 may be placed within the cylinder at opposite sides of a piston 44, as disclosed in Fig. 7.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus described the invention, what is claimed as new is—

1. The combination with a casing having a water inlet and outlet, and a dam within the casing; of a valve between the inlet and outlet, a closure for a hand-hole in the casing, a pivoted lever, a stem connecting said lever and the valve, a cylinder pivotally connected to the casing, a valved piston therein, a rod connecting the piston and lever, and means within the cylinder for retarding the movement of the piston.

2. The combination with a casing having a valve therein, and a stem extending from the valve; of a pivoted lever connected to the stem, a pivoted cylinder, a piston therein having a passage therethrough, a bracket extending over the passage, a threaded rod mounted within the bracket, a cap thereon, a rod connecting the piston and lever, and means within the cylinder for retarding the movement of the piston.

In testimony whereof I affix my signature in presence of two witnesses.

FELIX McCARTHY.

Witnesses:
A. J. BERNHART,
L. B. KEIM.