Nov. 10, 1925. 1,560,567

J. W. GRANT

WATER RELIEF VALVE

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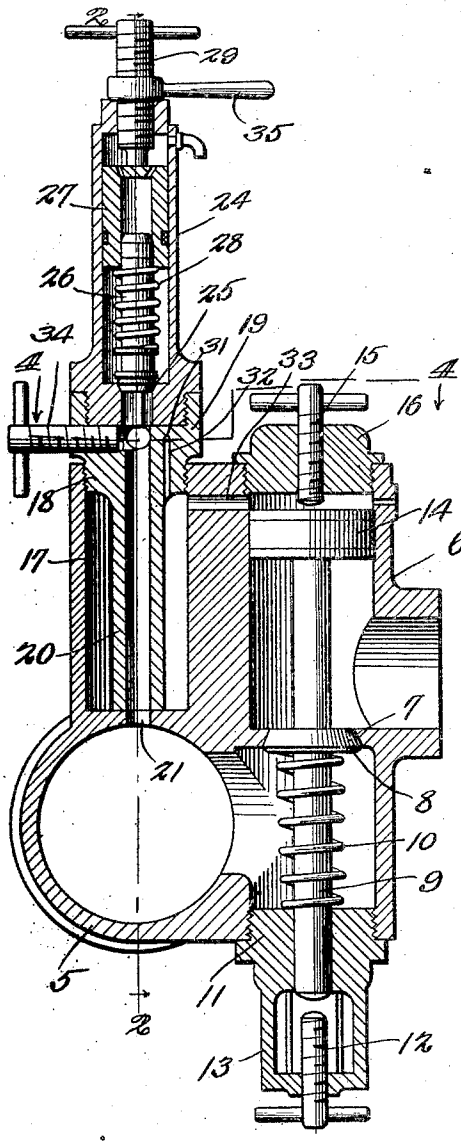


Fig. 1.

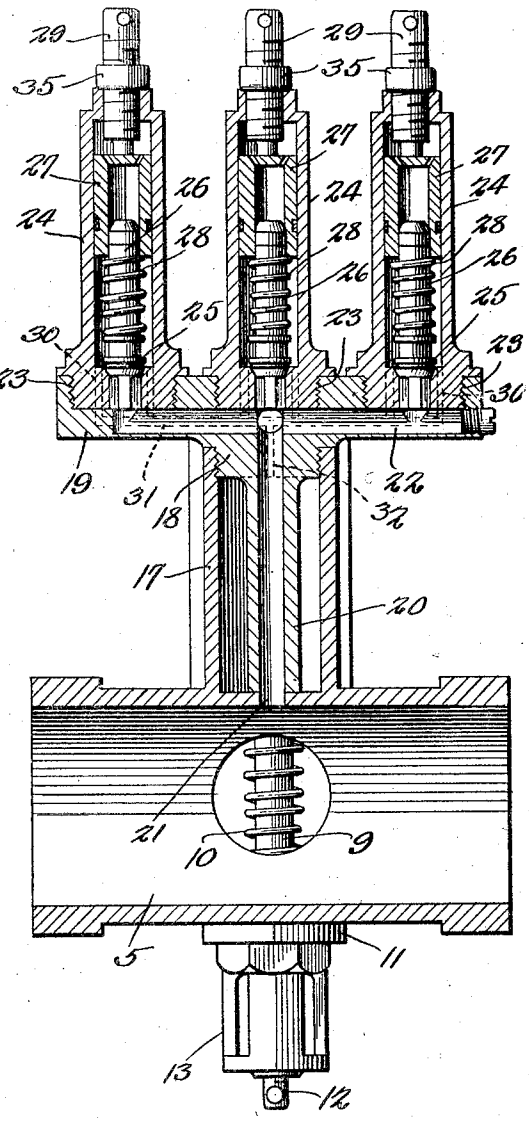


Fig. 2.

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Fig. 3.

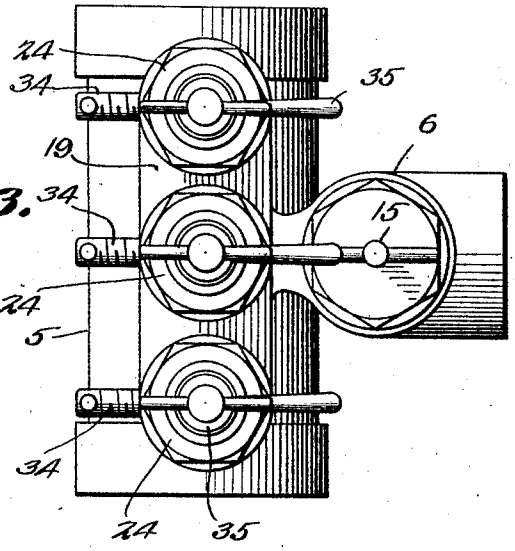
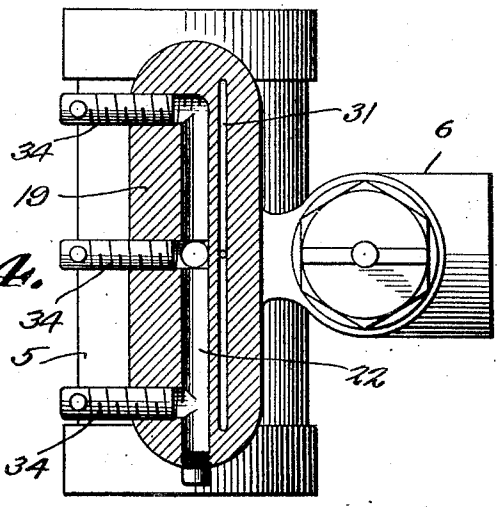


Fig. 4.



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UNITED STATES PATENT OFFICE.

JORDAN W. GRANT, OF PORTSMOUTH, VIRGINIA.

WATER-RELIEF VALVE.

Application filed July 7, 1925. Serial No. 42,049.

To all whom it may concern:

Be it known that I, JORDAN W. GRANT, a citizen of the United States, residing at Portsmouth, in the county of Norfolk and State of Virginia, have invented a new and useful Water-Relief Valve, of which the following is a specification.

This invention relates to relief valves to be used in high pressure water pipe lines, the primary object of the invention being to provide novel means for automatically relieving excessive water pressure in the pipe line to insure against damage to the pipe.

Another important object of the invention is the provision of means to adjust the movements of the valve mechanism forming a part of the device, thereby adapting the device for use in connection with various degrees of water pressure.

A still further object of the invention is to provide means whereby the automatically controlled valve mechanism may be cut off from the main or body portion of the device, to throw the same out of use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

Referring to the drawings:

Figure 1 is a longitudinal sectional view through a valve mechanism constructed in accordance with the invention.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a plan view of the device constructed in accordance with the invention.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Referring to the drawings in detail, the reference character 5 indicates the main or body portion of the device which includes a relatively short length of pipe which may be positioned in a high pressure water pipe line.

Disposed laterally of the body portion is an integral valve housing 6 which is provided with a valve seat 7 for reception of the valve 8 that includes a valve stem 9 and a coiled spring 10 surrounding the valve stem to normally urge the valve 8 to its seat. The valve stem 9 extends through an opening in the plug 11 that closes the lower end of the valve housing 6 and is adapted to contact with the screw 12 that extends upwardly through the housing 13 carried by the plug 11 to restrict downward movement of the valve and regulate the opening thereof.

The valve stem 9 is relatively long and carries the piston 14 at its upper end, which piston is restricted in its upward movement by means of the adjusting screw 15 that operates through the plug 16 mounted in the upper end of the valve housing 6.

Forming a part of the body portion is a housing indicated at 17 that is formed with internal threads at its upper end, which internal threads accommodate the plug 18 formed integral with the elongated valve support 19 to the end that the valve support may be positioned within the housing 17.

Extending downwardly from the plug 18 is a pipe 20 that engages the bottom of the housing 17 at a point directly over the opening 21 of the body portion 5 so that fluid may pass upwardly through the opening 21 and into the pipe 20 and plug 18 positioned thereabove.

Communicating with the pipe 20 is a horizontally disposed bore 22 adjacent to which are provided threaded openings 23 for the reception of the lower ends of the valve housings 24 that are supported by the valve support 19. The valve housings 24 are vertical and are provided with valve seats to accommodate the valves 25 carried at the lower ends of the rods 26 that move in the pistons 27, there being provided coiled springs 28 disposed between the valve members 25 and lower ends of pistons 27 for normally urging the valve members 25 to their closed positions.

Adjusting screws 29 operate in the upper ends of the valve housings 24 and are adapted to engage the pistons 27 to restrict movement of the valves 25, by tensioning the coiled springs 28 that act to urge the valves 25 to their closed positions.

In each valve housing 24 are bores 30 that communicate with the horizontal bore 31 disposed laterally of the bore 22, the bore 22 being in communication with bore 32 that communicates with the space between pipe 20 and the housing 17, which space also communicates with the housing 6 through the opening 33.

In order that the passage of water into the horizontal bore 22 may be restricted, a valve member 34 is provided that is adapted to move to a position over the pipe 20, cutting off the flow of liquid.

Locking members indicated at 35 operate on the adjusting screws 29 and act to hold the adjusting screws in their positions of adjustment.

In the operation of the device, water passes through the body portion 5, but when excessive pressure occurs in the body portion 5, water will pass upwardly through pipe 20 and into valve housings 24, where it will find its way through the bores 30 and into the lateral bore 31, from where the water passes into the space between pipe 20 and housing 17 from where the water flows into the valve housing 6, operating the piston 14 which in turn unseats the valve 8 allowing fluid to pass outwardly.

When the excessive pressure has been relieved, it is obvious that the spring 10 will return the valve 8 to its initial position and water will again flow through the body portion 5 as described.

I claim:—

1. In a device of the character described, a body portion, said body portion including a lateral valve housing, an outlet opening communicating with the valve housing, a spring pressed valve for normally preventing the passage of fluid through the outlet opening, a valve housing above the body portion, a support including a pipe positioned in the last mentioned housing, means in the support for controlling the passage of fluid therethrough, a bore establishing communication between the first mentioned valve housing and last mentioned valve housing to permit water to flow into the first mentioned valve housing to unseat the valve.

2. In a device of the character described, a body portion including a lateral valve housing and a vertical valve housing, said lateral valve housing having a lateral outlet opening, a valve for normally preventing the passage of liquid through the outlet opening, a slidable piston in the vertical valve housing, a valve including a valve stem movable in the second mentioned valve housing, a coiled spring on the valve stem and engaging the piston for restricting movement of the valve and valve stem, means for regulating the movement of the last mentioned valve, and said last mentioned valve adapted to be operated to admit fluid to the lateral valve housing to unseat the valve operating therein.

3. In a device of the character described, a body portion including a pipe through which water flows, said body portion having a lateral valve housing and a vertical valve housing, said lateral valve having an outlet opening, a valve support including a plug removably supported in the vertical valve housing, said valve support including a plurality of valve housings, pistons in the valve housings, valves having valve rods positioned in the valve housings, said valve rods adapted to move in the pistons, means for normally urging the pistons upwardly, and means operating through the valve housings for restricting movement of the pistons, and bores for establishing communication between the valve housings.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JORDAN W. GRANT.