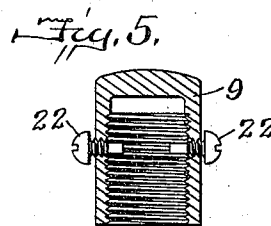
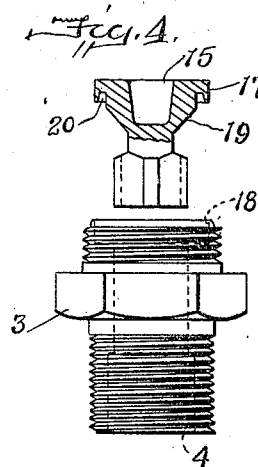
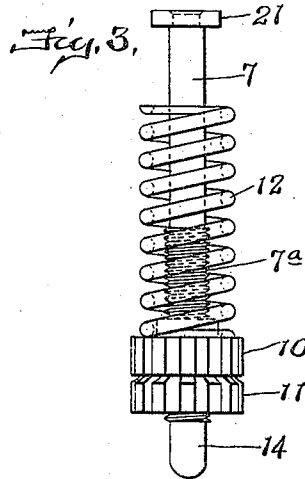
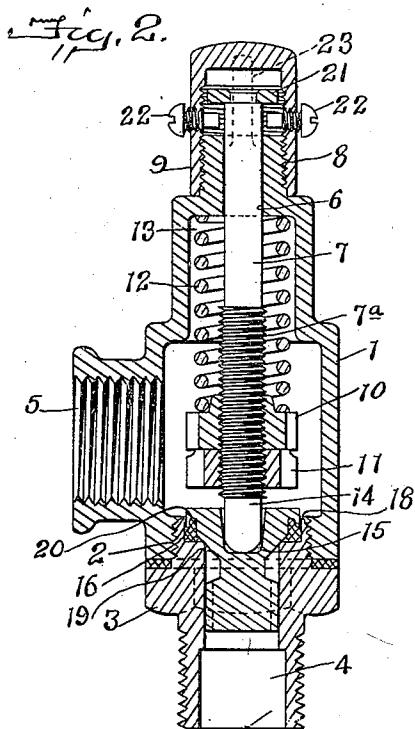
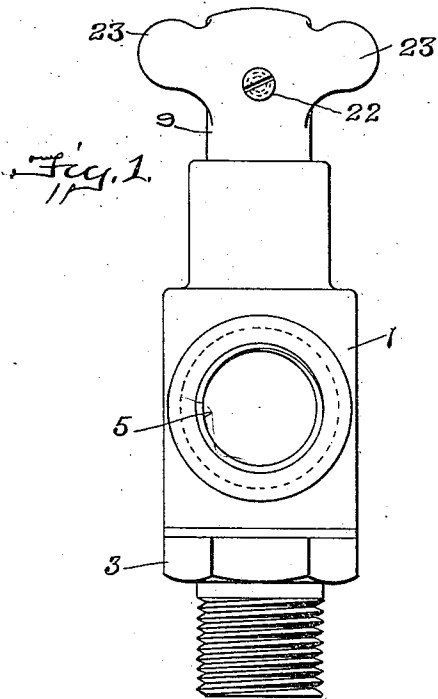


E. H. EICKMAN.
VALVE.
APPLICATION FILED SEPT. 2, 1919.

1,375,497.

Patented Apr. 19, 1921.



Inventor
Elmer H. Eickman,
Toulmin & Toulmin,

Attorneys

UNITED STATES PATENT OFFICE.

ELMER H. EICKMAN, OF DAYTON, OHIO, ASSIGNOR TO BUCKEYE IRON AND BRASS WORKS, OF DAYTON, OHIO, A CORPORATION OF OHIO.

VALVE.

1,375,497.

Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed September 2, 1919. Serial No. 320,994.

To all whom it may concern:

Be it known that I, ELMER H. EICKMAN, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Valves, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to valves, particularly to improved relief valves used in connection with liquid pressure systems, such as domestic water systems and sprinkler systems installed in buildings for the prevention of fires, and other similar uses wherein water or other liquids are maintained automatically within minimum and maximum pressures.

Valves of this character are usually provided with means for flushing to prevent or overcome sticking of the valve parts and thereby prevent proper functioning of the valve in response to the relative pressures of the liquid. In this connection it is a common fault of valves of this character to have leakage at the flusher or valve stem so that constant dripping of the pressure liquid in variable extent will result and thus cause more or less trouble with the system.

It is an object of the present invention to overcome this common defect in relief valves and to provide a valve in which leakage will not result either at the time of flushing the valve or between the flushing operations.

It is a further object of the invention to provide a valve of simple and substantial construction which in all respects will be dependable and effective for its intended uses.

An object of the invention is to provide a valve of the character stated in which the operable parts are well guarded against tampering. This has particular reference to the means for flushing the valve and is an important safeguard intended to prevent accidental or intentional setting or locking of the valve in open position and thus render the operation of the pressure system ineffective.

In the accompanying drawings,

Figure 1 is a side elevation showing the compact form and general design of my improved valve;

Fig. 2 is a longitudinal sectional view taken substantially through the center of the

valve and intersecting both the inlet and outlet ports;

Fig. 3 is a detail view of the valve stem including the pressure spring and pressure adjusting nuts assembled thereon;

Fig. 4 is a detail view of the valve seat housing and valve seat disassembled; and

Fig. 5 is a detail view in longitudinal section of the valve flusher cap showing its relation to the valve stem.

As here shown the invention consists of an integral valve housing 1 having a threaded aperture 2 in which a combined valve seat housing and coupling 3 is secured, the part 3 having an aperture 4 therethrough and the part 1 having a second threaded aperture 5 therein which constitute, respectively, the inlet and outlet ports of the valve. The end of the housing 1, opposite the inlet port, is provided with an aperture 6 which serves as a bearing for the valve stem 7, a portion of the end being threaded as at 8 to receive the flusher cap 9 which is mounted thereon and adjustably connected to the valve stem.

The valve stem 7 has an enlarged threaded portion 7^a upon which an adjusting nut 10 and a lock nut 11 are mounted. A coiled spring 12 is disposed about the valve stem between the adjusting nut 10 and a shoulder 13 of the main valve housing; thus by adjusting the position of the nut the spring may be compressed to develop the desired amount of pressure thereby on the valve stem, the lock nut being adjusted accordingly to hold the adjusting nut in place.

The inner end 14 of the valve stem extends substantially beyond the threaded portion 7^a and is adapted to engage freely a depressed portion 15 of a detached valve head which coöperates with the valve 16 of the part 3 to open and close the inlet port; the detached valve head being further provided with a circular portion 17 adapted to fit closely within a depressed portion 18, inwardly adjacent the valve seat 16 in the part 3, and with a cone-shaped portion 19 and a plurality of longitudinally extending vanes or flanges which extend into the aperture 4 and coöperate therewith to retain the valve head in proper operative relation to the valve seat and inlet port.

The inner end of the aperture 4 is slightly beveled or counter-bored to coöperate with the tapered or cone-shaped portion 19 to

more readily adapt the valve head to close the inlet port, an annular groove or depression 20 being formed in the inner face of the portion 17 to receive a washer or packing of suitable material to form a non-leakable closure for the inlet port when the pressure of the liquid is below the maximum.

The opposite end of the valve stem has secured thereto a flange or washer 21, which is riveted to the stem after the stem and the parts carried thereby are assembled in the valve housing. The valve flusher cap 9 is provided with screws 22 which extend through the cap on opposite sides thereof and engage the washer 21 on its inner face. Thus by rotating the cap 9 by means of the wings or finger holds 23 the valve stem may be raised against the pressure of the spring 12 to flush the valve, the valve stem and valve head being free at all times to move upwardly under pressure of the liquid independently of the flusher cap.

From the foregoing detailed description and the accompanying drawings the construction and operation of my improved valve will be readily understood. It will be seen that the valve may be regulated to release automatically at any desired pressure of the liquid by adjusting the spring 12 and that the spring will act immediately to close the valve and stop the discharge of liquid therethrough as soon as the pressure of the liquid is reduced by the discharge thereof through the valve to less than the pressure of the spring, the valve thus serving as an automatic control of the maximum pressure of the liquid to which the system is regulated.

In liquid pressure systems of this character it is the common practice to provide means for automatically restoring a mean or maximum pressure of the liquid as soon as the pressure falls to a minimum point. This is usually accomplished by means of a pump or other suitable apparatus which is automatically set in operation when the pressure of the liquid falls to the minimum. Thus with the relief valve to establish the maximum pressure and the means for restoring the pressure when it falls to the minimum the required range of pressures for continuous operation is obtained. Also it will be seen, that the valve may be flushed at will to release or prevent sticking of the operable parts.

Having thus fully described my invention,

what I claim as new and desire to secure by Letters Patent, is:—

1. In a valve, the combination, with a valve housing having an inlet and an outlet port respectively, a detached valve head cooperating with the inlet port, a spring actuated valve stem acting normally to hold the valve head in closed position relative to said port, and projecting exteriorly of the housing, and a valve actuating cap completely inclosing the projecting end of the stem and forming a fluid-tight joint with the housing.

2. In a valve, the combination, with a valve housing having an inlet and an outlet port, a valve head cooperating with the inlet port, a spring actuated valve stem acting normally to hold the valve head in closed position relative to said port and projecting exteriorly of the housing, a cap inclosing the projecting end of the stem and forming a fluid-tight joint with the housing, and means responsive to rotary movement of the cap to effect longitudinal movement of the stem.

3. In a valve, the combination, with a valve housing having an inlet and an outlet port, a valve head cooperating with the inlet port, a spring actuated valve stem acting normally to hold the valve head in closed position relative to said port, and a closed fluid-tight rotative flusher cap threaded to the valve housing normally disengaged from and adapted to cooperate with the valve stem, whereby the valve may be flushed manually.

4. In a valve, the combination, with a valve housing having an inlet and an outlet port, a detached valve head cooperating with the inlet port, a spring actuated valve stem engaged at one end with and acting normally to hold the valve head in closed position relative to said port, and having an intermediate threaded portion, an adjusting nut and a lock nut fitted on the threaded portion of the valve stem, whereby the pressure of the spring cooperating with the valve stem may be adjusted and maintained in adjusted position and a flusher cap adapted to actuate the valve stem in one direction to flush the valve, and an adjusting cap engaging the opposite end of the stem and adjustably fitted on the housing.

In testimony whereof, I affix my signature.

ELMER H. EICKMAN.