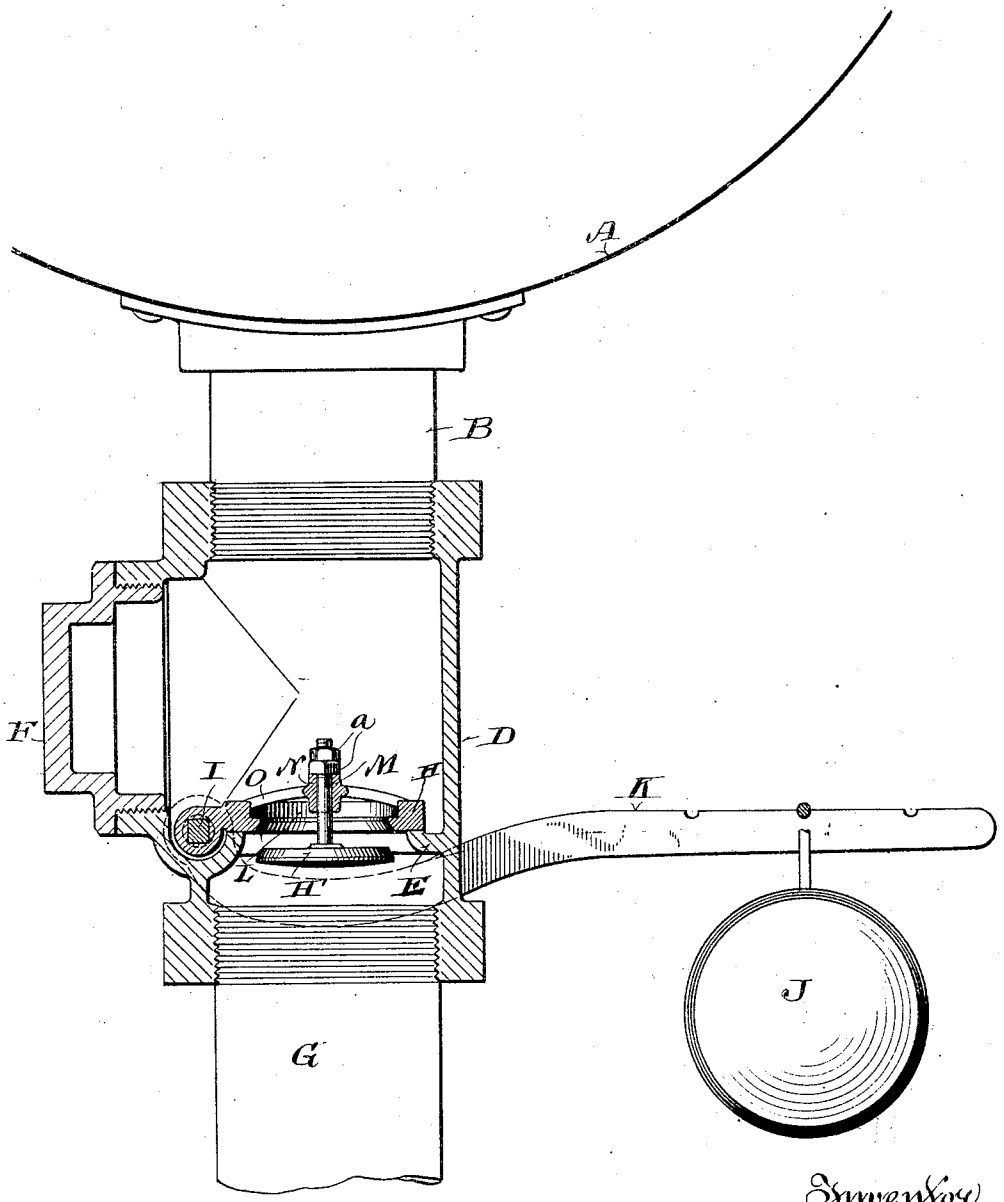
No. 880,088. PATENTED FEB. 25, 1908.

C. W. MILLER.

RELIEF VALVE.

APPLICATION FILED JULY 6, 1905.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES W. MILLER, OF MILWAUKEE, WISCONSIN.

RELIEF-VALVE.

No. 880,088. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed July 6, 1905. Serial No. 268,385.

To all whom it may concern:

Be it known that I, CHARLES W. MILLER, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Relief-Valves; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention consists in certain peculiarities of construction and combination of parts hereinafter particularly set forth with reference to the accompanying drawing and subsequently claimed, its object being to provide a valve especially designed for use in hot-water heating-systems to maintain a uniform pressure, the same device being also applicable, in various instances, as a relief-valve.

The drawing represents a vertical sectional view of a valve and its casing in accordance with my invention, the casing being shown in connection with an expansion-tank and a pipe of a heating-system.

Referring by letter to the drawing, A indicates a fragment of an expansion-tank, *b* a tubular connection between the tank and casing D of my improved valve. The casing is provided with a valve-seat E, and a screw-cap F serves as a closure for a hand-hole in said casing. Coupled to the lower end of the casing is a pipe G of a heating-system. A ring-portion H of a flap-valve L is normally at rest on the seat E in the casing, which seat is formed by an annular flange connecting the casing-walls, there being a semi-circular pocket or depression in the flange for the reception of an ear-extension of the ring-portion H of the flap-valve. This ear-extension is provided with a squared opening into which is fitted a squared section of a rod I, for which said casing is provided with bearings coaxial with the pocket, one end of the rod projecting through the aforesaid casing for the reception of an arm K, there being an adjustable weight J suspended from the arm adapted to hold the flap-valve to its seat under normal conditions.

An independently movable central check-valve portion H′ of the flap-valve L has a stem M guided in a hub N connecting spider-arms O of said valve. This check portion of the valve is by gravity normally below the remainder of said valve, the distance of its descent being regulated by nuts *a* engaging the screw-threaded end of the stem M above the hub N aforesaid.

In practice, the weight J is adjusted on the arm K to hold the flap-valve L on the seat E in the casing D at a predetermined pressure, and the fluid in the pipe G is unable to unseat said valve until after the independently movable check-valve portion H′ thereof is closed on its seat, said closure being effected by the rise of water in the system. This independently movable check portion of the valve having closed, the rise of fluid back of the same is stopped until such time as there is sufficient pressure generated to overcome the opposing resistance and lift the flap-valve, as a whole, from the seat in its casing.

By the application of the valve to a hot-water heating-system having an expansion-tank open to atmospheric-pressure it is possible to obtain the same results as those of the usual pressure systems, in the following manner: The system being filled with water to the overflow opening of the expansion-tank, the weight J for example, is adjusted to cause the flap-valve L to exert a pressure upon its seat E of ten pounds. If the water is then heated it will, owing to expansion, endeavor to rise into the expansion-tank, this will cause the check-valve portion H′ to seat, thus cutting off communication between said tank and pipe-system, and as the temperature of the water continues to rise the expansion thereof will produce a pressure in the system which will be maintained until the water reaches a temperature of approximately 250 degrees, or a pressure of about ten pounds to the square inch upon the valve, which pressure will cause the latter to open and allow the water to flow into the tank until said pressure is reduced sufficient to allow the weight J to again seat the flap-valve. Now if the temperature of the water in the system should drop sufficiently, the water in the pipe below the valve, under ordinary conditions, would contract and leave an air-space between said valve and the water-line, and to overcome this defect the check-valve portion H′ is arranged to open by gravity or the weight of the water in the tank above, and thus permit the same to flow back into the system, thereby always keeping the

system filled below the expansion-tank and maintaining a pressure when the water is heated.

I claim:

In a relief-valve provided with a casing having an annular flanged seat and a semi-circular pocket in the annular flanged seat; the combination of a flap-valve comprising a ring-portion adapted to close upon the flanged seat, the ring-portion being provided with an ear-extension fitted into the pocket, a central apertured hub in spider-connection with the ring-portion, a gravity-controlled check-valve closure for said ring-portion, a stem for the check-valve in reciprocative engagement with the hub of the aforesaid ring-portion, a rod fitted in the ear-extension of the ring-portion, bearings for the rod in the casing, an arm secured to said rod exterior of said casing, and an adjustable weight in connection with the arm.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

CHARLES W. MILLER.

Witnesses:
GEO. W. YOUNG,
H. E. OLIPHANT.