C. E. MARION.

STEAM TRAP.

APPLICATION FILED APR. 4, 1919.

1,316,171. Patented Sept. 16, 1919.

Fig. 1.

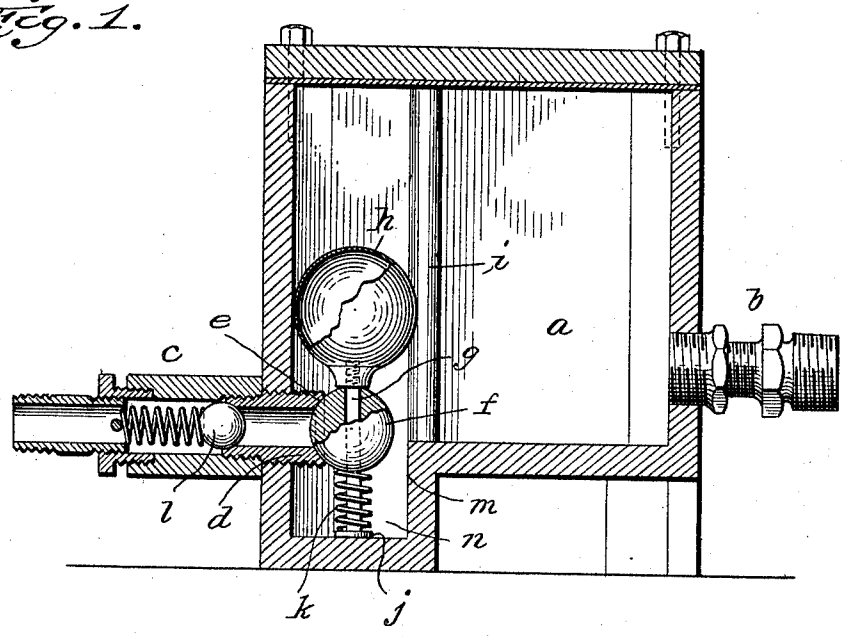
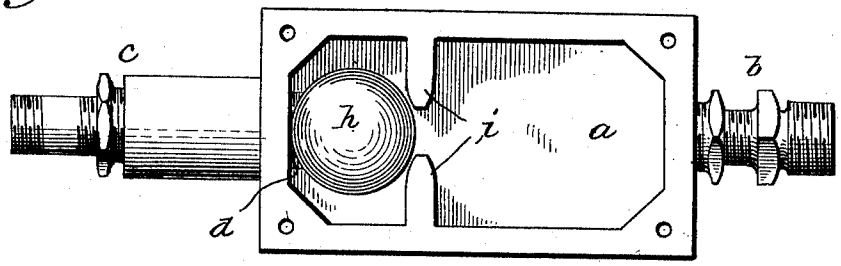


Fig. 2.



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STEAM-TRAP.

1,316,171. Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed April 4, 1919. Serial No. 287,471.

To all whom it may concern:

Be it known that I, CHARLES E. MARION, a citizen of the United States of America, and a resident of Franklin, county of Merrimack, and State of New Hampshire, have invented certain new and useful Improvements in Steam-Traps, of which the following is a full and clear specification.

The object of this invention is to simplify and improve the construction of a device of this sort, and the invention consists of certain novel features of construction hereinafter described and claimed.

In the drawing—

Figure 1 is a view partly in vertical section and partly in side elevation of my improved trap;

Fig. 2 is a plan view thereof with the cover removed.

In the drawings, *a* designates the water trap-chamber which may be of any suitable size and shape, this chamber being provided with a steam and water inlet *b* at one side and a water outlet *c* at the other side. The outlet pipe extends inwardly into the trap-chamber beyond the inner surface of the wall of the trap-chamber, as shown at *d*, to form a nipple which projects into the trap-chamber to a point a short distance from the inner face of the wall. The inner end of this nipple is rounded out to form a rounded valve-seat *e*, and against this seat is seated a spherical valve *f* which is desirably made of aluminum but which may be made of any other non-corrodible substance which is light in weight.

The valve-ball *f* is mounted to freely slide on a stem *g* which passes centrally through the ball; and attached to the upper end of this stem is a spherical float *h* which is guided in its vertical movement by the adjacent end-wall of the trap-chamber and a pair of inwardly-extending vertical flanges *i* on the side-walls of the trap-chamber. The stem *g* depends to a point below the valve member *f* and is provided with a head *j*, and between this head and the valve *f* is arranged a light coil-spring *k* which tends to normally hold the ball-valve *f* against the under side of the float. In the outlet pipe *c* is arranged an outwardly-opening check-valve *l* of any suitable construction. When the interior of the trap-chamber is subjected to steam pressure, the ball-valve *f* will be held by said pressure to its seat in the end of the water-outlet conduit *d*, and the pressure of steam will maintain the valve *f* in this position until sufficient water is accumulated in the trap-chamber to raise the float to a point where it will pull or rock the ball-valve *f* slightly off its seat, whereupon the pressure in the trap-chamber will cause the water in the same to be forcibly ejected through the outlet pipe *c*; and when the water in the trap-chamber is lowered sufficiently to free the valve-ball *f* sufficiently to permit it to settle against its seat *i*, the ejection of water will be cut off. When the valve *f* is seated, the float will be supported on the bottom of the trap-chamber through the medium of the stem *g* and the head *j*. The spring *k* insures the valve-ball *f* being held at the proper height for engagement with the valve-seat *e* at all times, and when the float rises the spring will be compressed, the spring being light enough in tension to permit its compression by the upward pull of the float before the ball-valve *f* is rocked off its seat. It will be understood that there is sufficient room between the valve-seat *e* and the guide-ribs *i* to permit the ball-valve *f* to be rocked away from its seat when the float is lifted by the rise of water in the trap-chamber, and yet it is important that the valve-ball be confined sufficiently close to the valve-seat *e* to insure it being again seated thereagainst when the steam pressure again rises in the trap-chamber after the discharge of the water accumulated therein. The ball is thus confined close to its seat by means of the aforesaid guide-ribs *i* and the adjacent upstanding wall *m* of the trap-chamber, these ribs *i* and the wall *m* forming virtually a well *n* in which the valve-ball is confined at all times. The spring *k* also permits a certain amount of vibration or agitation of the float without prematurely disturbing the valve-ball on its seat.

By the use of the check-valve *l*, I utilize the steam pressure to force the ejected water to a higher level than the trap-chamber, since the check-valve will shut off all back-flow of water into the trap-chamber.

It will be understood that the shape and size of the float may be varied at will; the float may, in fact, be rectangular in shape instead of the spherical shape shown.

The nature and scope of the invention having been thus indicated and its preferred

embodiment having been specifically described, what is claimed as new is:

1. In a device of the class set forth, a ball-valve adapted to seat over the water-outlet, a float provided with a stem having a sliding passage through the ball, said stem depending below the ball and being surrounded by an extensible spring normally tending to press the ball toward the float, for the purpose set forth.

2. In a device of the class set forth, a ball-valve adapted to close the water-outlet, a float having a stem passing freely down through the ball-valve, and means whereby the rising of the float to a predetermined point will dislodge the ball from its seat.

3. In a device of the class set forth, a ball-valve adapted to close the water-outlet, a float having a stem passing freely down through the ball-valve, and means whereby the rising of the float to a predetermined point will dislodge the ball from its seat, said means embodying a yielding device normally tending to bring the ball and the float together.

4. In a device of the class set forth, a trap-chamber having a steam-inlet and a water-outlet, a ball-valve adapted to seat over the water-outlet, means being provided for holding said valve adjacent said outlet when the valve is open, a float having a stem slidingly depending through said ball-valve and adapted to rest on the stationary part of the trap-chamber, and a spring surrounding the depending end of said stem and arranged to normally bring the ball-valve and the float together.

5. In a device of the class set forth, a valve adapted to close the water-outlet, a float, and yielding means connecting the float to the valve to permit a limited yielding movement between the float and the valve prior to the opening of the valve by the float, said means embodying a rod attached to the float and slidably connected to the valve, and a spring adapted to be compressed by the rod when the float rises.

In testimony whereof I hereunto affix my signature.

CHARLES E. MARION.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."