(No Model.) 2 Sheets—Sheet 1.

J. H. BULLARD.

VALVE FOR REGULATING THE INGRESS OF LIQUIDS TO TANKS.

No. 419,408. Patented Jan. 14, 1890.

Fig. 1.

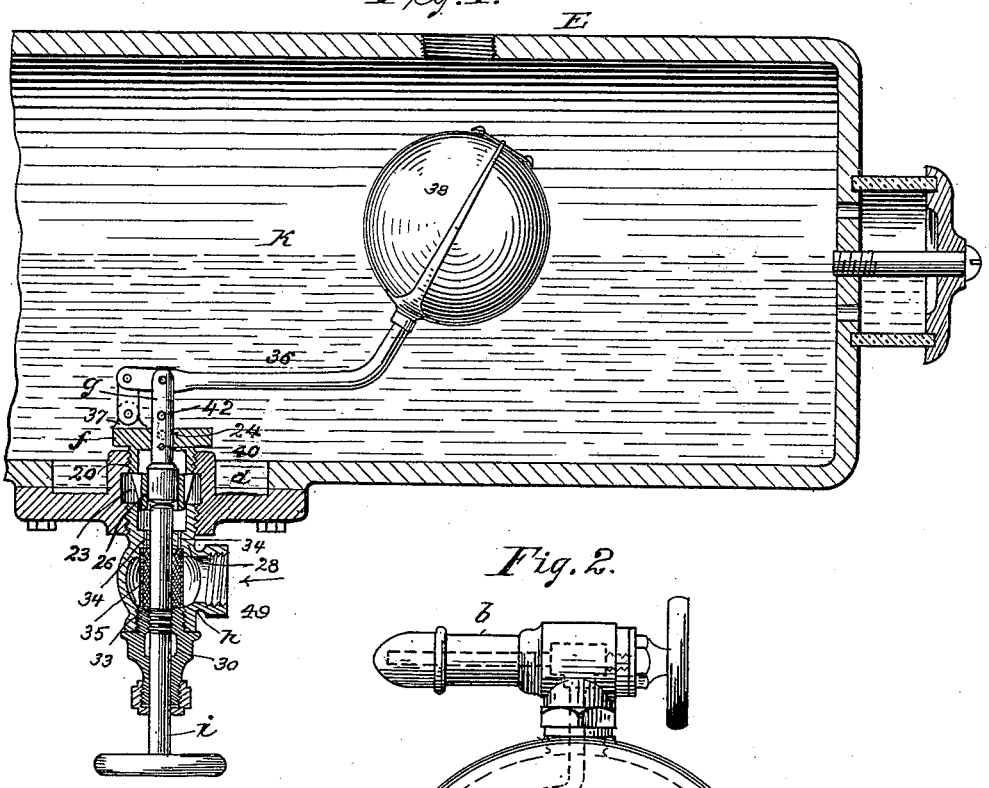


Fig. 2.

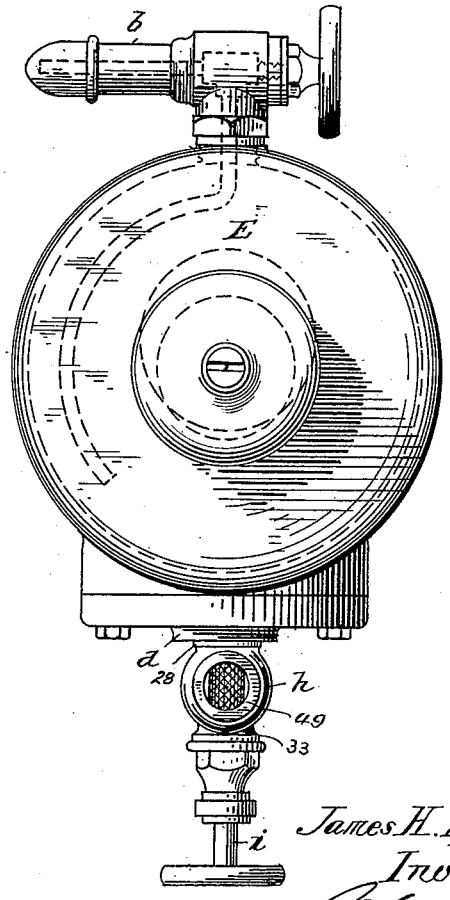
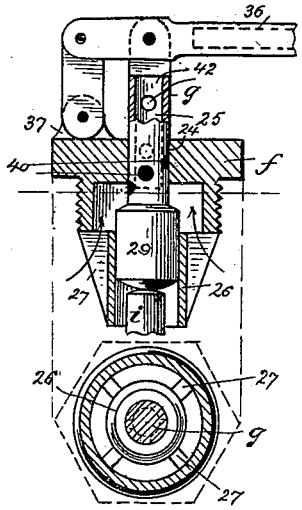


Fig. 3.



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W. F. Bellows
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per Chas. Pinckney
" Attorney.

(No Model.) 2 Sheets—Sheet 2.

J. H. BULLARD.

VALVE FOR REGULATING THE INGRESS OF LIQUIDS TO TANKS.

No. 419,408. Patented Jan. 14, 1890.

Fig. 4.

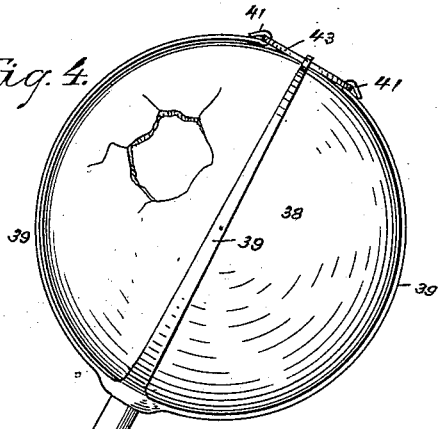
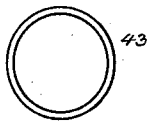


Fig. 6.



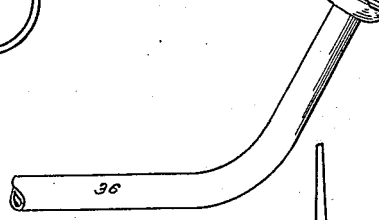


Fig. 5.

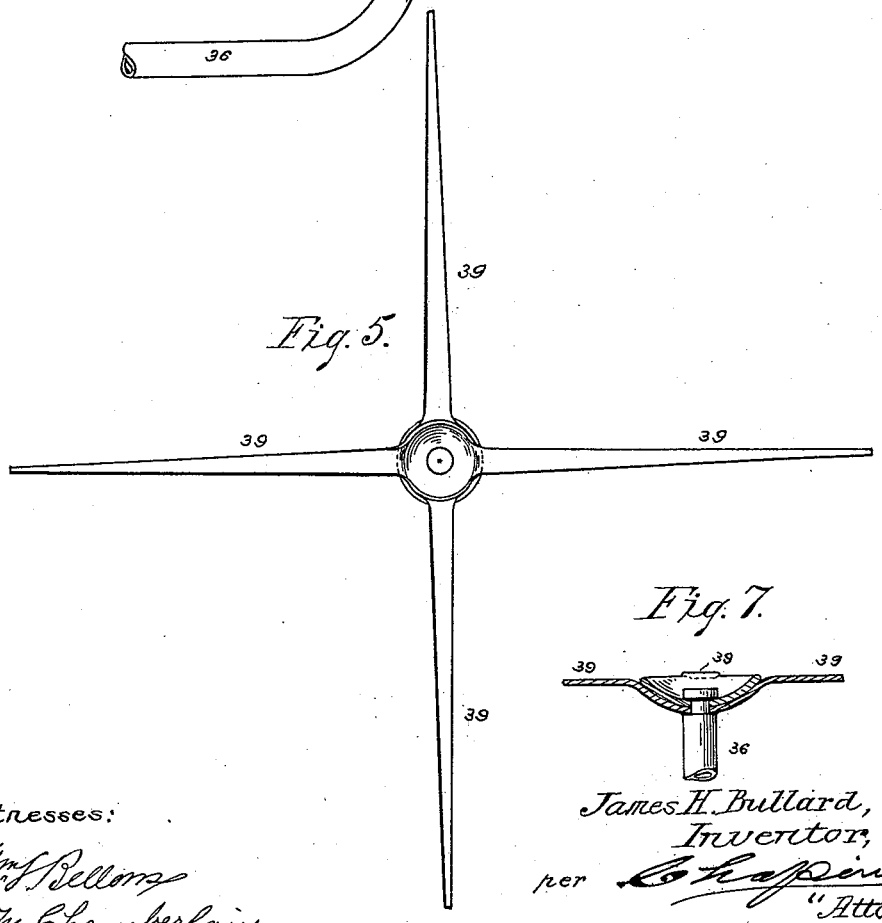


Fig. 7.

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UNITED STATES PATENT OFFICE.

JAMES HERBERT BULLARD, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE AERATED FUEL COMPANY, OF SAME PLACE.

VALVE FOR REGULATING THE INGRESS OF LIQUIDS TO TANKS.

SPECIFICATION forming part of Letters Patent No. 419,408, dated January 14, 1890.

Application filed June 1, 1889. Serial No. 312,936. (No model.)

To all whom it may concern:

Be it known that I, JAMES HERBERT BULLARD, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Valves for Regulating the Ingress of Liquids to Tanks, of which the following is a specification.

This invention relates to improvements in valves for regulating the ingress of liquids to reservoirs, being particularly applicable for use for governing the passage of hydrocarbon to a burner-tank of the class described in an application for Letters Patent filed by me December 1, 1887, Serial No. 256,588, although the same may be advantageously employed in other situations and for other purposes.

As will appear from the description hereinafter given, the valve may be adjusted from time to time to permit the ingress of varying quantities of liquid below a given maximum, and it further comprises automatically-operating means, whereby on the passage into the tank of an undue quantity of liquid, accidentally or otherwise, the valve will be operated to check such increased inflow; and the invention consists in the constructions and combinations of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar characters of reference designate corresponding parts in all the views.

Figure 1 is a central longitudinal vertical sectional view of a tank, being in the present instance a burner-tank for a hydrocarbon-fuel-burning system, showing the improved means for maintaining the desired level for the liquid therein, to be hereinafter particularly described. Fig. 2 is an end elevation of the same. Fig. 3 is an enlarged central sectional view in detail of parts shown in Fig. 1, and also a sectional projection, and all as will hereinafter more fully appear. Fig. 4 is a side elevation of an improved construction of ball-float. Figs. 5, 6, and 7 are views in detail of parts of said ball-float.

E represents a tank having a boss *d* formed on the inclosing-wall thereof, preferably at the bottom, and screw-threaded, as at 20 and 22, at its inner and outer end portions, between which is an annular chamber 23, and a thimble *f* screws into said inner portion of the boss, having therein an axial aperture 24, in which fits for vertical movement a spindle *g*, axially bored for the upper portion of its length, as at 25, below which it is solid, and is provided with an enlargement, as indicated at 29, which enlargement has a bearing for vertical movement in a collar 26, supported by arms 27 from and below said thimble. The wall of the hollow part of the spindle is provided with perforations 40, arranged spirally or at different points relative to the length thereof, so that some of said perforations will lie below the said aperture 24, while others will be within and be closed by the walls of said aperture, and there is to be one or more openings 42 from said hollow part of the spindle leading to the interior of the burner-tank above the top wall of the thimble.

A T-coupling *h* by its one branch 28 screws into the end 22 of the boss *d*, receiving at its branch 49 a suitable oil-pipe. A gland 30 is fitted in the branch 33 of the coupling in line with the branch 28, and through same a stem *i* is entered, which has a screw-thread engagement intermediate of its length with the gland and projects inwardly to a bearing upon the end of said solid portion 29 of the spindle *g*, being supported in axial alignment by the guiding-spider 34, formed integrally with the branch 28 of the coupling, and said stem at its outer end is provided with a handle for the convenient turning thereof.

A strainer 35, of wire-cloth or other suitable material, is placed at the end of the inlet of the coupling encircling the stem, for preventing the entrance into each burner-tank of any sediment or foreign matter in the liquid.

By turning the stem *i* the spindle *g* will be raised or permitted to fall, closing or unclosing more or less of the perforations 40, and thereby the supply of liquid to each tank may be approximately adjusted in accordance with the demands thereon; but furthermore, and in order that a certain level may never be exceeded in the tank, a ball-cock K is applied

to act on said spindle by linking one end of its carrying-arm 36 to a lug 37 on the thimble and by connecting an intermediate part of said arm with the end of the spindle.

The provision of the enlargement 29 of the spindle insures a complete and effectual closing of the aperture 24 through the thimble when said spindle is forced upwardly by the stem *i* to bear by said enlargement against the under side of said thimble-head and about the orifice of said aperture, which complete closing otherwise would not be secured, for the stem is to fit said aperture 42 so loosely for its free play therethrough that without said enlargement there would be considerable leakage into the tank when it might be desirable to entirely shut off all entrance of liquid thereto.

An improved form of ball-float is herein illustrated, consisting of a hollow glass ball 38, the walls of which are as thin as possible consistent with durability, and the end of the lever-arm 36 is provided with means for retaining the said ball, consisting of metallic strips 39, crossing each other at their intermediate portions and confined the one upon the other and both upon the end of the lever-arm, and the end portions of said strips are bent to encircle the glass ball, nearly meeting at a common point, and bent at their ends to form eyes 41 to interlock with a tie-ring 43. This construction of ball-float is especially designed for use in hydrocarbon-burner tanks, as heretofore in the use in oil-tanks of hollow metallic balls composed of two hemispherical shells soldered together the chemical action of the oil has impaired the solidity of the solder, and leakage of the ball-float has resulted, rendering it defective. Such disadvantage under the present construction is obviated.

What I claim as my invention is—

1. In combination, a tank provided with a hollow boss *d*, having the screw-threaded end openings 20 22 and the intermediate connecting enlargement or chamber 23, a thimble *f*, screwing into said end opening 20 and having an apertured head and carrying the collar 26 below the annular body of said thimble and supported within said chamber 23, the spindle having the enlargement 29, fitting in said thimble-aperture and in said collar, closed at its lower portion, but hollow at its upper portion, and having openings 42 leading to the interior of the tank, and having the perforations 40 through its side at varying heights within and adjacent to said thimble-aperture, a T-coupling by one branch screwing into the opening 22 of said hollow boss, by one branch adapted to receive an inlet-conduit and in its other branch provided with a gland, a stem *i*, having a screw engagement with said gland and upwardly extended to bear upon the end of said spindle, and on which stem said spindle bears by its gravity, substantially as described.

2. In combination, a tank provided with a hollow boss *d*, having the screw-threaded end openings 20 22, and the intermediate connecting enlargement or chamber 23, a thimble *f*, screwing into said end opening 20 and having a head provided with the axial aperture 24, and the collar 26 below the annular body of said thimble and supported within said chamber 23, the spindle having the enlargement 29, fitting in said thimble-aperture and in said collar, closed at its lower portion, but hollow at its upper portion, and having openings 42 leading to the interior of the tank, and having the perforations 40 through its side at varying heights within and adjacent to said thimble-aperture, a ball-float and carrying lever-arm, by the latter intermediately thereof pivotally connected to the upper end of said spindle and by its inner end linked to said thimble-head, the T-coupling by one branch screwing into the opening 22 of said hollow boss, by one branch adapted to receive an inlet-conduit, and in its other branch provided with a gland, a stem *i*, having a screw engagement with said gland and upwardly extended to bear upon the end of said spindle, and on which stem said spindle bears by its gravity, substantially as described.

3. The combination, with the arm 36, of the metallic strips 39, connected to the end of said arm, the hollow glass ball 38, embraced by said metallic strips, and a tie-ring interlocking with the ends of said strips, substantially as described, and for the purpose set forth.

JAMES HERBERT BULLARD.

Witnesses:
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G. M. CHAMBERLAIN.