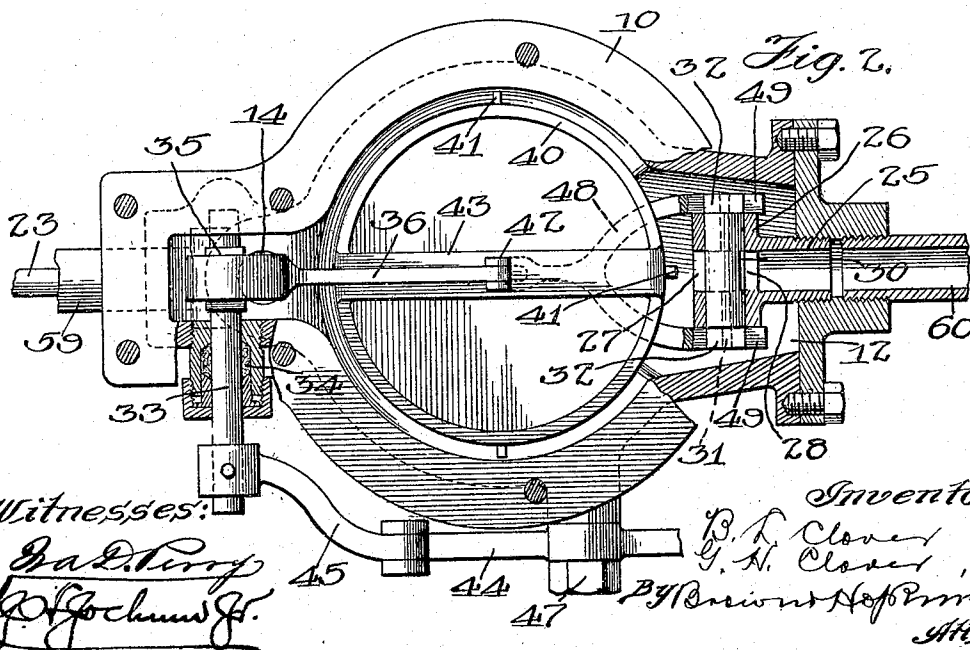
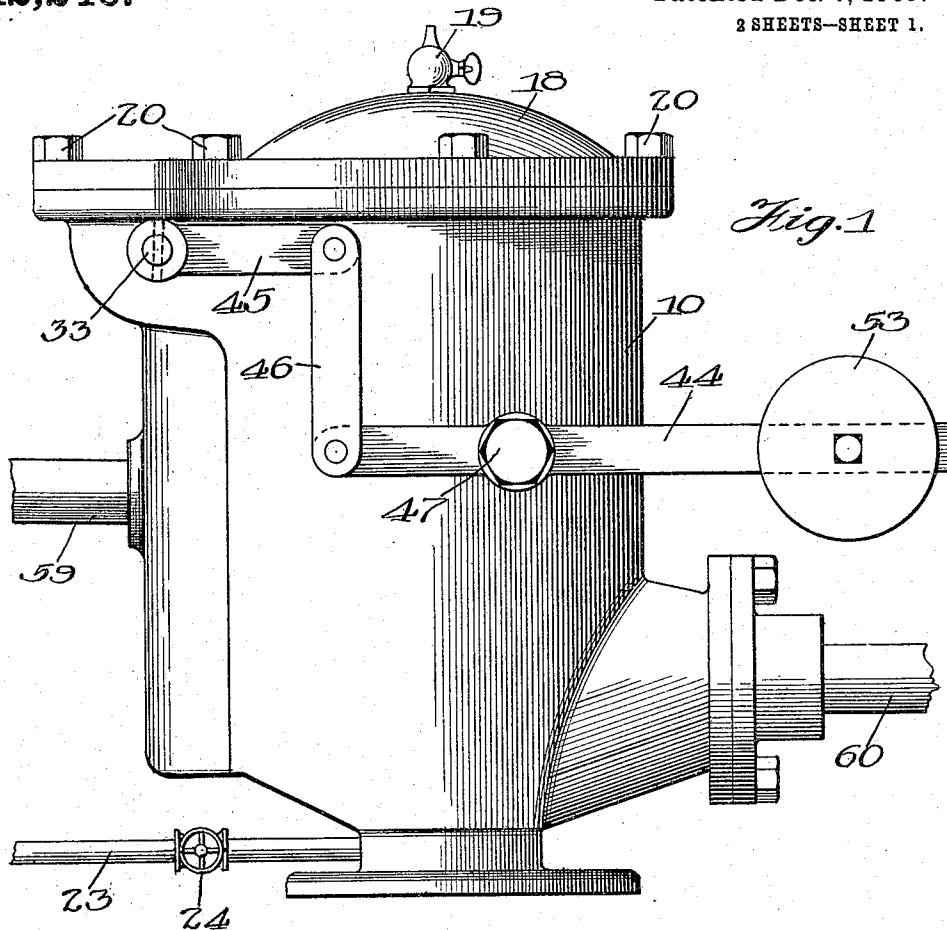


B. L. & G. H. CLOVER.
VALVE FOR STEAM TRAPS.
APPLICATION FILED NOV. 4, 1907.

942,246.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.



Witnesses:

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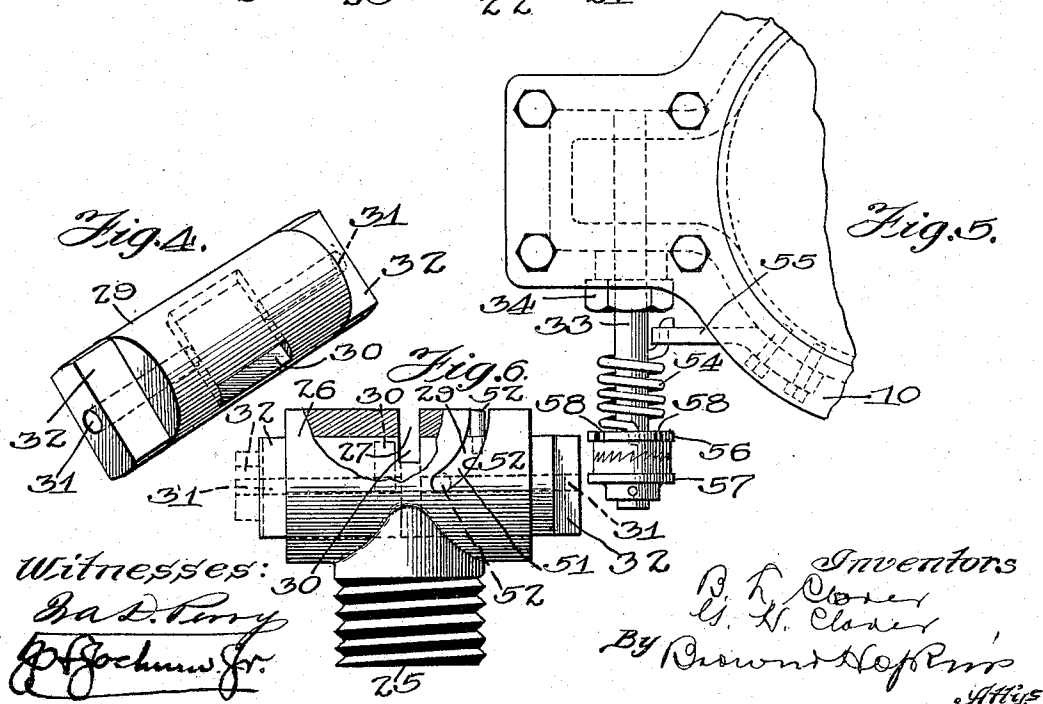
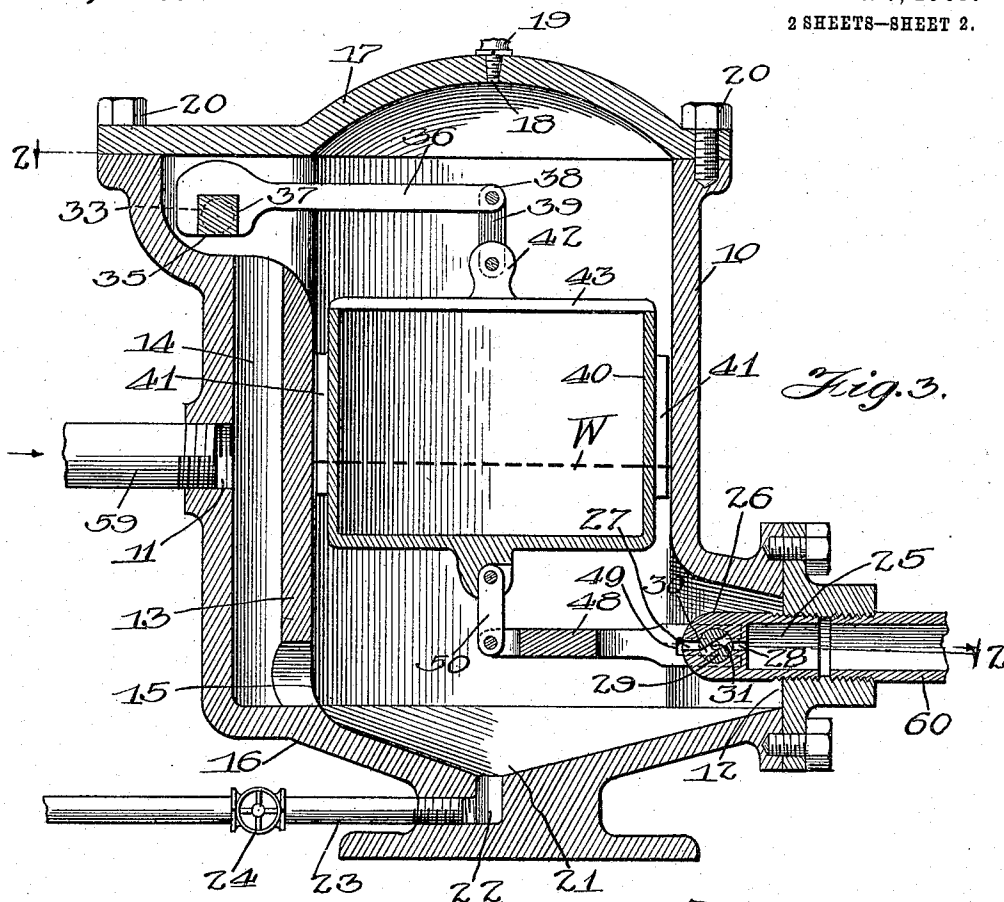
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942,246.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

BENTON LYTCH CLOVER AND GRIFFITH HARVEY CLOVER, OF CHICAGO, ILLINOIS.

VALVE FOR STEAM-TRAPS.

942,246.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed November 4, 1907. Serial No. 400,529.

To all whom it may concern:

Be it known that we, BENTON LYTCH CLOVER and GRIFFITH HARVEY CLOVER, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves for Steam-Traps, of which the following is a specification.

This invention relates to improvements in steam traps and more particularly to the valve therefor and the primary object of the invention is to provide an improved, simple and durable device of this character which will be effective and positive in operation.

A further object is to provide improved means for counterbalancing the valve operating member or float.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings, illustrating the embodiment of the invention and in which—

Figure 1 is an elevation of a steam trap having a valve applied thereto constructed in accordance with the principles of this invention. Fig. 2 is a detail sectional view taken on irregular line 2—2 of Fig. 3. Fig. 3 is a vertical sectional view of Fig. 1. Fig. 4 is a detail perspective view of the valve. Fig. 5 is a detail plan view of a modified form of counterbalance for the valve operating member or float. Fig. 6 is a detail view, partly broken away, of a modified form of the valve and valve housing.

Referring more particularly to the drawing, the numeral 10 designates the casing of the trap which is provided with an inlet 11 and a discharge outlet 12. The inlet 11 is preferably located intermediate the top and bottom of the trap and arranged within the casing and spaced from the inlet 11, and extending thereacross is a wall or partition 13 to form a port or passage 14 within the casing, the wall or partition 13 being provided with an aperture 15 at the base thereof adjacent the base 16 of the casing, which forms a communication between the port or passage 14 and the interior of the trap. The upper end of the wall or partition terminates some distance short of the top of the casing so that the upper portion of the port or passage 14 communicates with the interior of

the casing adjacent the top thereof. A suitable cover or closure 17 is provided for the casing and is provided with a vent opening 18 within which is secured an ordinary pet cock 19. The closure 17 may be held in position and against displacement in any desired or suitable manner, preferably by means of screws or bolts 20 passing therethrough and into the wall of the casing 10. The bottom 16 of the casing is preferably depressed toward its center as at 21, and leading through the base and communicating with the bottom at the lowest point of the depressed portion 21 is a blow-off outlet 22 to which is connected a suitable pipe 23 having a controlling valve 24, whereby the trap may be cleaned of any sediment or foreign matter.

Secured within the discharge outlet 12 of the casing 10 is a coupling 25, which is provided with a valve housing or casing 26 preferably, arranged transversely thereof, and extending for some distance beyond the sides of the coupling. This casing or housing 26 is preferably provided with registering apertures 27, 28 therein which also register with the coupling 25 and are preferably arranged in a straight line therewith.

A valve plug 29 is provided with an aperture 30 extending transversely therethrough intermediate its ends and is also provided with apertures 31 extending through the ends of the valve plug transversely of the aperture 30 and communicating therewith. The extremities of the valve plug 29 are preferably reduced on diametrically opposite faces thereof to form flattened or angular faces 32, which project beyond the ends of the housing or casing 26 when the valve plug is placed therein and these faces 32 are preferably arranged at an angle with relation to the aperture 31.

Journaled within the casing 10 adjacent the top thereof and extending across the casing preferably to one side of the port or passage 14 is a rock shaft 33, one extremity of which projects through a suitable bushing or packing 34 and beyond the outside of the casing, as shown more clearly in Fig. 2 of the drawings. This rock shaft is preferably provided with an angular portion 35, which is located within the casing 10. An arm 36 is provided with an angular recess 37 adjacent one extremity thereof, which is adapted to receive the angular portion 35 of the rock shaft 33, so that when either the arm 36 or shaft 33 is rocked, the other will be corre-

spondingly moved thereby. The free extremity 38 of the arm 36 projects for some distance into the casing 10 and preferably terminates adjacent the diametric center thereof and connected thereto by one end is a link 39.

Arranged within the casing 10 is a float 40 which is preferably in the form of an open receptacle having the open portion at the top thereof. This float may be constructed of any desired material, such as metal or the like, and is of a diameter slightly smaller than the interior diameter of the casing 10 to form a space therebetween, and secured to the periphery of the float are suitable members 41 which stand in close proximity to the inner face of the casing to permit a free and easy movement of the float and prevent its binding against the wall of the casing. The float may be connected to the link 39 in any desired or suitable manner, preferably by means of an ear 42 on a suitable cross piece 43 which is secured to the upper edge of and extends across the float.

An arm 44 is pivotally mounted intermediate its ends as at 47, preferably upon the outside of the casing 10. Secured to the projecting extremity of the rock shaft 33 is an arm 45 below which the arm 44 is preferably located and the adjacent extremities of these arms are connected by means of a link 46 so that when the arm 44 is moved about its point of pivotal support 47 the shaft 33 will be rocked through the medium of the link 46 and the arm 45, and the said arm 44 will be rocked about its point of pivotal support 47 when the shaft 33 is rocked through the medium of the float 40, link 39 and arm 36 in a manner to be set forth.

Any suitable means may be provided for oscillating the valve plug 29 within the housing or casing 26. A suitable and efficient means for accomplishing this purpose comprises a yoke 48, the extremities of the arms of which are bifurcated as at 49. The arms are spaced from each other a suitable distance, so that when the bifurcated portions 49 thereof are placed over the reduced extremities of the valve plug so that the flattened faces 32 thereof will engage the faces of the bifurcation, the extremities thereof will rest against the extremities of the valve housing to prevent lateral displacement of the yoke. The free extremity of the yoke is pivotally connected to the float 40 preferably by means of an interposed link 50. With the parts thus connected it will be seen that when the float 40 rises or falls, the valve plug 29 will be oscillated within its housing so as to move the aperture 30 therein into or out of communication with the registering apertures 27, 28 in the valve housing or casing. The bifurcations 49 of the yoke 48 being open will permit the yoke to

be readily detached from the valve plug when desired.

In the exemplification of the valve plug and casing shown in Fig. 6 of the drawings, the casing or housing 26 is provided with an angularly disposed slot or aperture 51 and a pin or lug 52 is secured to the valve plug 29 and extends into the slot 51 so that when the valve plug 29 is rotated in the housing 26, the pin 52 will move in the slot 51 to impart a slight reciprocating movement to the valve plug during its oscillatory movement.

In use, water is supplied to the casing 10 up to the water line designated by the reference character W, which water will cause the float 40 to assume the position shown in Fig. 3 of the drawings, which is the normal position of the float. When the float is in this position the valve plug 29 will assume the position shown in Fig. 3, that is, with the port 30 out of line with the registering apertures 27, 28 in the housing 26, to close the outlet and confine the water within the trap. The float is then counterbalanced or maintained in this position by means of a suitable counterbalancing weight 53 which is adjustable on the free end of the arm 44 on the outside of the casing. As the water of condensation accumulates in the trap, the float 40 will be raised and the valve plug 29 will be rotated to move the port 30 into communication with the apertures 27, 28, in the housing to permit the accumulated water of condensation to be discharged from the casing.

By employing an open receptacle as a float instead of a hollow air float, all danger of rendering the air float ineffective by the latter becoming perforated, will be overcome. By providing the adjustable counterbalancing weight 53 on the arm 44, the float may be made to operate effectively whether any of the water of condensation enters the float or not. By adjusting the weight 53 the time of operation of the valve plug 29 may be varied to vary the level of the water of condensation in the trap.

The casing 10 is somewhat wider at its discharge outlet 12 than the link of the valve plug 29 and housing 26 so as to form a space between the ends of the plug and the casing to permit the water of condensation to flow through the apertures 31 therein and out of the aperture 30 so as to prevent injury to the valve plug or "wire drawing" to the edges of the aperture 30 adjacent the aperture 27 in the casing when the aperture 30 is in a position to form only a slight outlet through the aperture 27.

In Fig. 5 of the drawings, there is shown a modified form of counterbalancing mechanism for the float 40, which preferably comprises an elastic member 54 in the form of a coil spring which surrounds the pro-

jecting extremity of the rock shaft 33. One end of the spring is secured to a stationary portion of the casing 10, such as a bracket 55 secured thereto, and the other extremity is secured to a clutch member 56 which is loosely mounted upon the end of the rock shaft 33. A cooperating clutch member 57 is secured to the rock shaft 33 for rotation therewith and the clutch members 56, 57 are held in engagement with each other by means of the spring 54. The clutch member 56 may be provided with suitable notches or recesses 58 for the reception of a spanner wrench, by means of which the clutch member 56 may be rotated about the rock shaft 33 to increase the tension of the spring 54 to meet the existing conditions.

Suitable pipes 59, 60 may be connected respectively to the inlet opening 11 and the discharge opening 12 adjacent the coupling 25 to convey the steam and water of condensation to the trap and to convey the water of condensation discharged from the trap to any desired point.

The apertures 27, 28 in the valve housing 26 being located in a direct line with the discharge outlet, a straight unobstructed blow out passage will be formed when the port 30 is brought into register therewith to permit all of the accumulated foreign matter in the trap to be blown out through the discharge outlet.

In order that the invention might be fully understood by those skilled in the art, the details of the foregoing embodiment thereof have been thus specifically described, but

What we claim as new and desire to secure by Letters Patent is—

1. A valve for steam traps and the like comprising a housing having registering inlet and discharge openings, a valve plug within the housing provided with a single port passing therethrough and adapted to simultaneously communicate with the registering openings, said plug being also provided with a passage communicating with the trap and also with the port in said plug, and means for moving the plug in the housing.

2. A valve for steam traps and the like comprising a valve housing provided with registering apertures and having open ends, a valve plug within the housing provided with a single port extending therethrough and adapted to simultaneously communicate with the apertures in the housing, said plug being also provided with passages extending through the ends thereof and communicating with the port in said plug, said housing and plug terminating short of the walls of the trap whereby the water of condensation may enter the said passages, and means for operating the valve plug.

3. A valve for steam traps and the like comprising a housing provided with regis-

tering apertures and having open ends, a valve plug within the housing provided with a port extending therethrough and adapted to communicate with the apertures in the housing, said plug being also provided with passages extending through the ends thereof and communicating with the port therein, the ends of the plug projecting beyond the ends of the housing and terminating short of the walls of the trap and being provided with angular extremities, and a yoke for operating the valve provided with bifurcated portions in which the angular extremities are adapted to be seated.

4. A valve for steam traps and the like comprising a valve housing provided with registering apertures, a rotary valve plug in the housing provided with a port adapted to register with the apertures, the extremities of the plug projecting beyond the housing and terminating short of the walls of the trap, said plug being also provided with passages extending therethrough and communicating with the port therein, means for rotating the valve plug, and means for bodily moving the valve plug in the housing during its rotary movement.

5. A valve for steam traps and the like comprising a housing provided with registering apertures, a rotary valve plug in the housing provided with a port adapted to register with the apertures, the extremities of the plug projecting beyond the housing and terminating short of the walls of the trap, said plug being also provided with passages extending therethrough and communicating with the port therein and also with the trap, means for rotating the plug, and a pin and slot connection between the plug and housing for bodily moving the valve plug in the housing during its rotary movement.

6. A valve for steam traps and the like, comprising a housing having registering ports therein and provided with open ends, a valve plug within the housing provided with a port passing transversely therethrough and adapted to register with the said apertures, the ends of the plug projecting beyond the housing and being provided with angular faces, said plugs being also provided with apertures extending longitudinally through the ends thereof and communicating with the port therein, and a member detachably engaging the angular extremities of the plug for oscillating the plug in the housing to move the port therein into and out of register with the apertures in the housing.

7. A valve for steam traps and the like, comprising a housing having registering ports therein and provided with open ends, a valve plug within the housing provided with a port passing transversely therethrough and adapted to register with the

said apertures, the ends of the plug projecting beyond the housing and provided with angular faces, said plug being also provided with apertures extending longitudinally through the ends thereof and communicating with the port therein, and a member detachably engaging the angular extremities of the plug for oscillating the plug in the housing to move the port therein into and out of register with the apertures in the housing, said housing being also provided with an angularly disposed slot, and said plug being provided with a projection

extending into and movable in the slot for longitudinally moving the plug during its oscillatory movement. 15

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 29th day of October A. D. 1907.

BENTON LYTCH CLOVER.
GRIFFITH HARVEY CLOVER.

Witnesses:

J. H. JOCHUM, Jr.,
CHARLES H. SEEM.