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PATENTED JUNE 16, 1908.

W. E. BRYANT.

AUTOMATIC OIL CHECK FOR LUBRICATOR DRAIN PASSAGES.

APPLICATION FILED JULY 1, 1907.

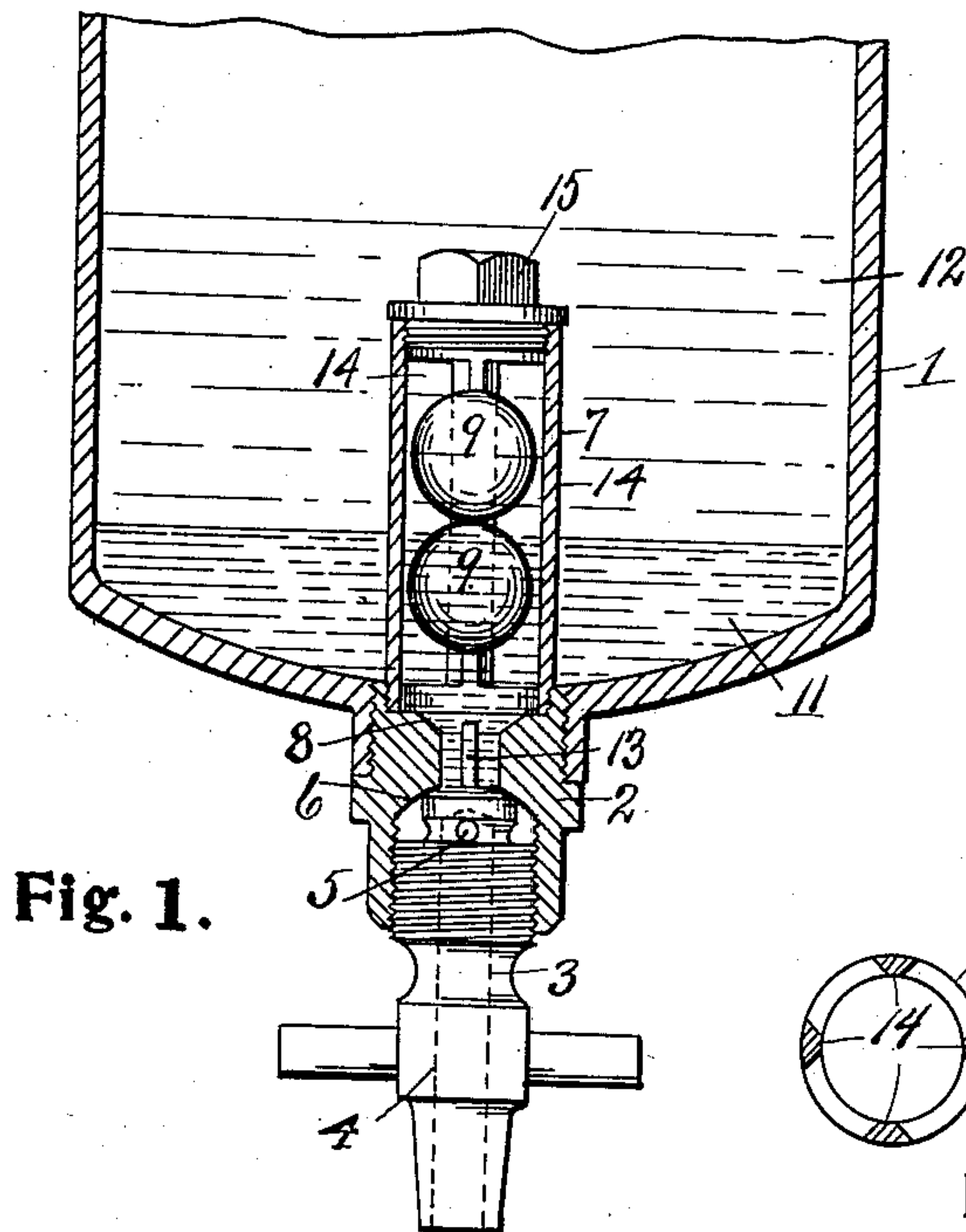


Fig. 1.

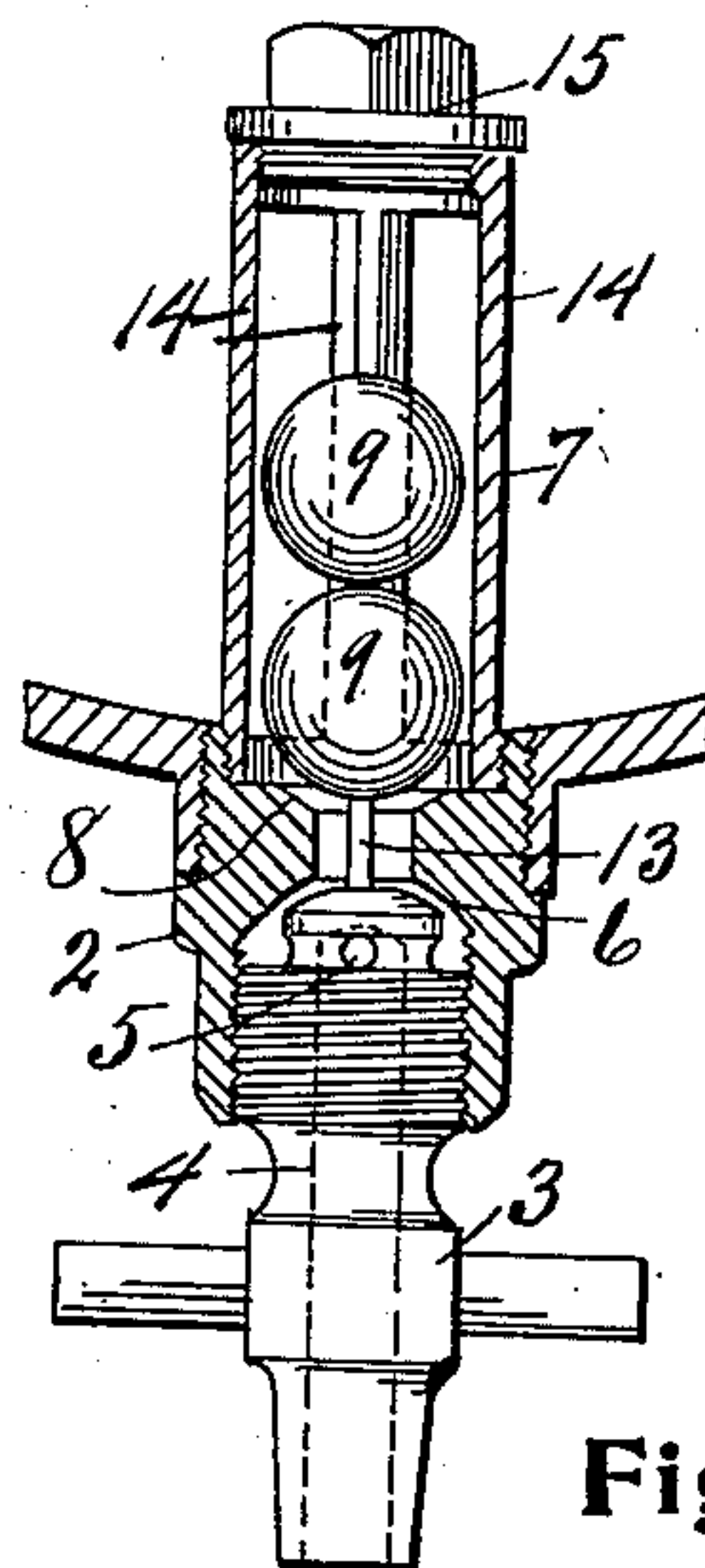


Fig. 3.

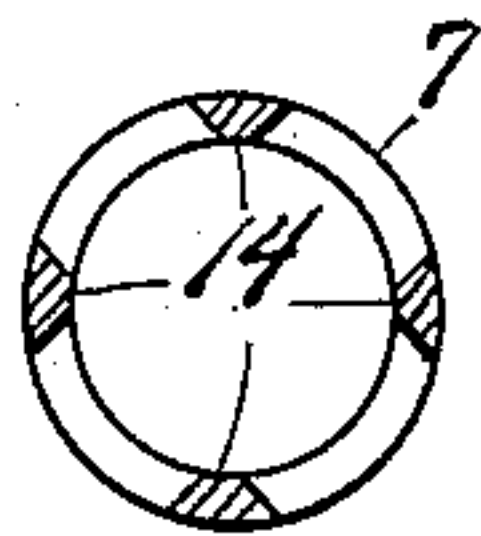


Fig. 4.

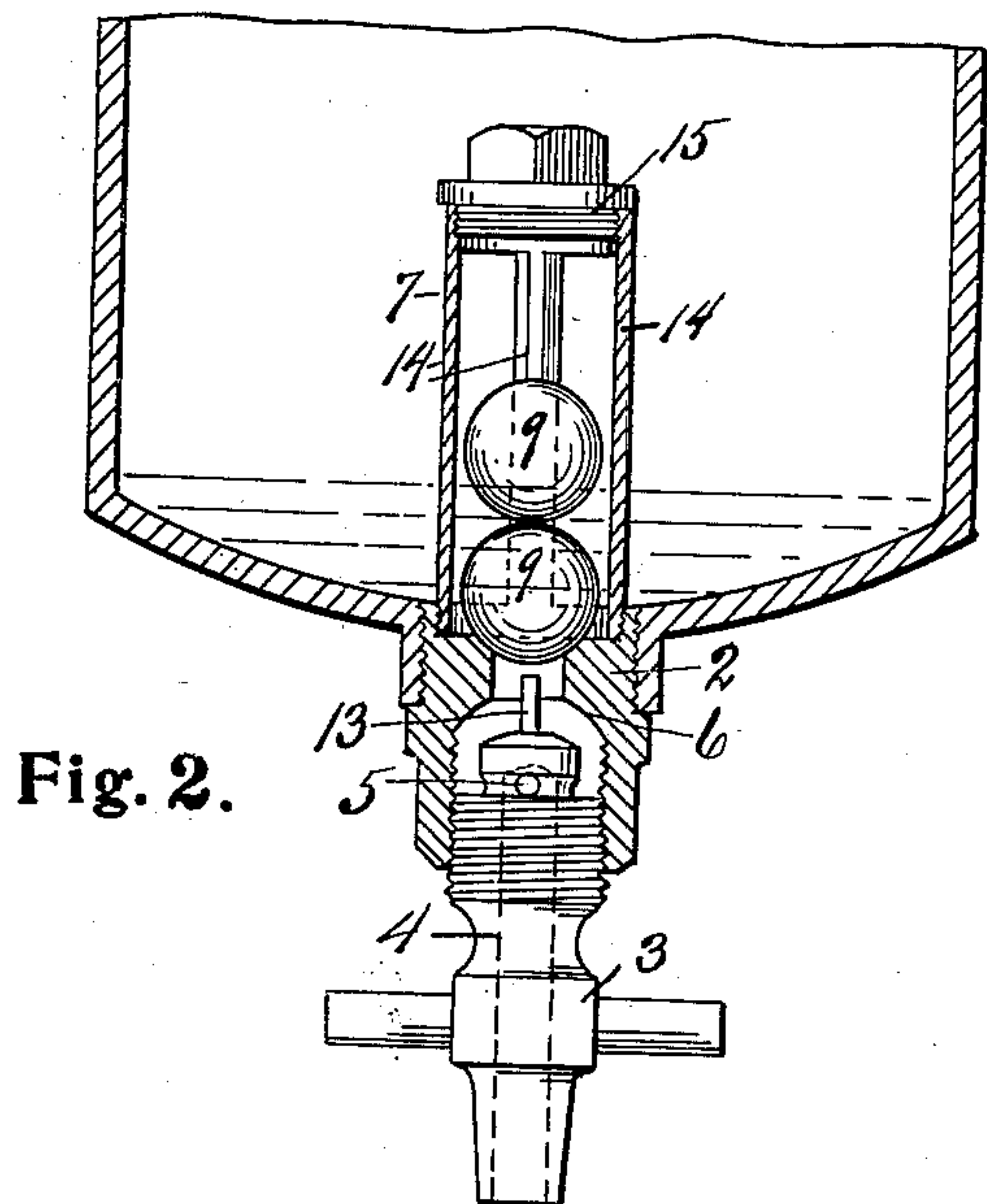


Fig. 2.

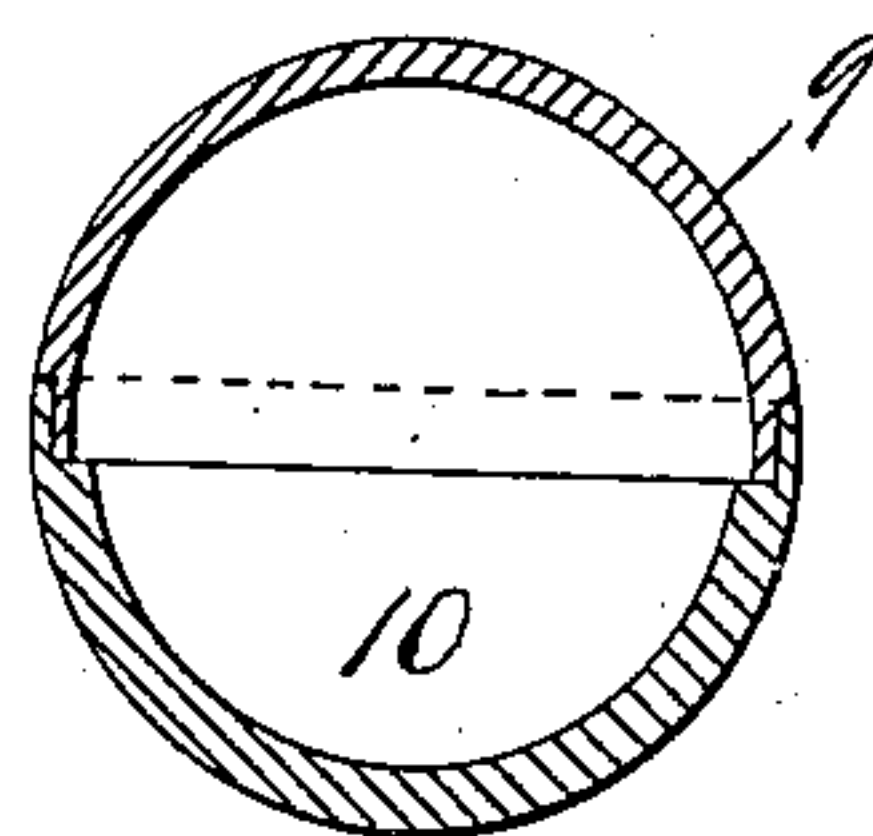


Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC OIL-CHECK FOR LUBRICATOR DRAIN-PASSAGES.

No. 890,757.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed July 1, 1907. Serial No. 381,637.

*To all whom it may concern:*

Be it known that I, WILLIAM E. BRYANT, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Automatic Oil-Checks for Lubricator Drain-Passages; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to lubricators of the hydrostatic type, and particularly to a float valve for automatically closing the drain passage opening leading from the body of the lubricator to prevent the escape of oil when draining the water from a lubricator preparatory to refilling it, and the invention consists in the construction and association of parts hereinafter more fully set forth and claimed.

The object of the invention is to provide simple and efficient means of such character as to readily withstand the high pressure present within the reservoir of the lubricator, especially in lubricators designed for locomotive use, and wherein the arrangement is such as to automatically effect a closing of the drain passage leading from the lubricator body upon the discharge of the water therefrom, the residuary oil within the body or reservoir being retained and the wasting thereof prevented. The above object is attained by the device illustrated in the accompanying drawings, in which:—

Figure 1 is a central vertical section through the lower portion of a lubricator body or reservoir, provided with a drain cock plug and check valve embodying my invention, the parts being in their normal position. Fig. 2 is a similar view, showing the position of parts at the time of draining the water from the reservoir, the valve being seated to prevent the passage of oil. Fig. 3 is a sectional view through the plug cock and valve cage, showing the position of parts when it is desired to blow out the reservoir by passing a current of steam therethrough. Fig. 4 is a transverse section through the valve cage. Fig. 5 is an enlarged diametrical section

through a ball valve, showing the weighted lower half for the purpose of directing the ground surface of the ball to the valve seat.

Referring to the characters of reference, 1 designates the body or reservoir of the lubricator, the upper portion of which is broken away, said reservoir being adapted to contain oil and water in superimposed relation, as will be well understood.

Screwed into a tapped opening in the bottom of the reservoir is a drain plug 2 having a central aperture therethrough and provided with a plug cock 3 which is screwed into the lower end of said plug and provided with a central opening indicated by dotted lines 4 extending longitudinally thereof and communicating at its upper end with a transverse aperture 5 extending through the wall of said cock. The upper end of the plug cock is adapted to seat at 6 around the opening through the plug 2 to close the passage therethrough. When the plug 3 is unscrewed from its seat, as shown in Fig. 2, communication is established between the passage way through the plug cock and the interior of the reservoir to allow the fluid contents of the reservoir to pass therefrom through said plug cock, except when the drain passage way is closed by the check valve, as hereinafter explained.

The upper end of the plug 2 is counter-bored and tapped, and into said tapped openings is screwed the lower threaded end of the valve cage 7. The upper end of the plug 2 forms the bottom of the valve cage and is provided with a tapered seat 8 for the lower ball of the ball valves 9. These valves, as will be seen, are spherical and are formed hollow to give them the required buoyancy, while the lower ball which seats at 8 is provided at its lower arc with a thickened wall 10, as clearly shown in Fig. 5, to add weight to the lower side of the ball, whereby said side is always caused to swing downward and is always presented to the seat 8. By this arrangement, a perfect fitting for the valve on its seat may be accomplished by grinding the lower periphery of the ball to said seat.

The specific gravity of the balls is such as to cause them to float in water and sink or precipitate in oil. In the operation of the ordinary hydrostatic lubricator, water of



condensation is directed into the bottom of the oil reservoir, whereby an equal amount of oil is displaced and discharged out the oil feed pipes, not shown, which lead from the reservoir near the top. At the time the oil which filled the reservoir of the lubricator shall have been discharged therefrom, the reservoir will be filled with water of condensation, necessitating the drawing off of said water to enable the reservoir to be refilled with oil. To enable the water to be drawn off, the plug cock is opened, as shown in Fig. 2, when the water 11 will be discharged through said cock. As the water is drawn off and the oil 12, of which there will be a quantity always on the top of the water, reaches the balls so as to cause them to become immersed therein, the density of the oil will not be sufficient to float the balls, causing them to precipitate and seat at 8, thereby preventing the passage of any of the oil from the reservoir. The plug cock is then closed and the reservoir refilled with oil, the parts then being in the normal operative position of the lubricator. As the water of condensation accumulates in the bottom of the lubricator, the balls will be floated, as shown in Fig. 1, leaving the drain passage way open for the drawing off of the water when it is again necessary to drain the reservoir. It will be noted that the upper end of the drain cock is provided with an extending pin 13 which when said plug cock is seated, will engage the lowermost ball and hold it from the seat 8. The purpose of this pin is to enable the lowermost ball to be held from its seat, as shown in Fig. 3, thereby providing for blowing out the reservoir with steam whenever it is desired to do so, a steam passage way being afforded for this purpose, past the lowermost ball and through the plug cock, which in that position is not seated.

The valve cage 7 is composed of four triangular bars 14 connected by a ring at the top and bottom and between which the balls are confined to move vertically. In the upper end of the valve cage is a screw plug 15 which affords access to the interior of the cage enabling the balls to be placed therein or removed therefrom at pleasure.

It has been found that where a single float valve was employed for this purpose, it was necessary to make it oblong in shape in order to afford the required gravity when immersed in oil and enable the valve to be employed in this particular capacity because of the comparatively restricted area within which it must be used. The extremely high pressure carried in locomotive boilers made it difficult to maintain an oblong valve in this capacity without said valve collapsing under said pressure. To obviate said difficulty and devise a valve, which, while buoyant in water should supply the requisite

gravity when immersed in oil and enable the application of said weight to a comparatively small area or seat, and at the same time withstand any pressure which it might be necessary to carry in the reservoir, I devised the double ball valve shown herein. The two balls will readily float when immersed in water so as to keep the drain passage open for the discharge of the water of condensation when required; said balls, however, will precipitate in oil and by placing one above the other in the manner shown, the upper ball will add its weight to that of the lower ball to hold the lower ball upon its seat when the water shall have been withdrawn from the reservoir, and prevent a possible escape of oil due to the rolling of the lower ball from its seat because of the swinging and jolting of the locomotive. The upper ball, as a rule, will be partially out of the oil which occupies the bottom portion of the reservoir after the water has been drained therefrom, as shown in Fig. 2, thereby materially adding to the weight of the lower ball to retain it seated.

By attaching the valve cage to the drain plug in the manner shown, said plug and valve cage are made interchangeable with all lubricators using a standard drain plug, enabling any lubricator to be fitted with this device by removing the ordinary drain plug and substituting therefor the plug and valve cage herein shown.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a reservoir adapted to contain liquids of different specific gravity and having a drain passage leading therefrom, of a float valve consisting of plural float members adapted to close said drain passage when surrounded by the lighter liquid.

2. The combination with a reservoir adapted to contain water and oil in superimposed relation and having a discharge opening leading therefrom, of a float valve in said discharge opening adapted to seat therein to prevent an outward flow of fluid there-through, said float valve consisting of plural members buoyant in water but precipitable in oil.

3. The combination with a reservoir, of a drain plug communicating therewith, a valve cage on said plug projecting into the reservoir, a spherical float valve in said cage adapted to seat and close the drain opening and a drain cock in said plug.

4. The combination with a reservoir, of a drain plug communicating therewith having a drain opening therethrough, a valve cage mounted on the plug projecting into the reservoir, a plurality of spherical valves within said cage in superimposed relation, the lowermost valve being adapted to close the drain



opening, said valve being buoyant in water and precipitable in oil, and a drain cock in said plug.

5 5. The combination with a reservoir adapted to contain liquids of different specific gravity and having a drain passage leading therefrom, of a float valve adapted to close said opening when immersed in the lighter

liquid, said float valve being heavier upon one side than on the other.

In testimony whereof, I sign this specification in the presence of two witnesses.

WILLIAM E. BRYANT.

Witnesses:

E. S. WHEELER,  
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