T. J. COLE.

TANK SIGHT GAGE.

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1,144,528.

Patented June 29, 1915.

Fig. 1.

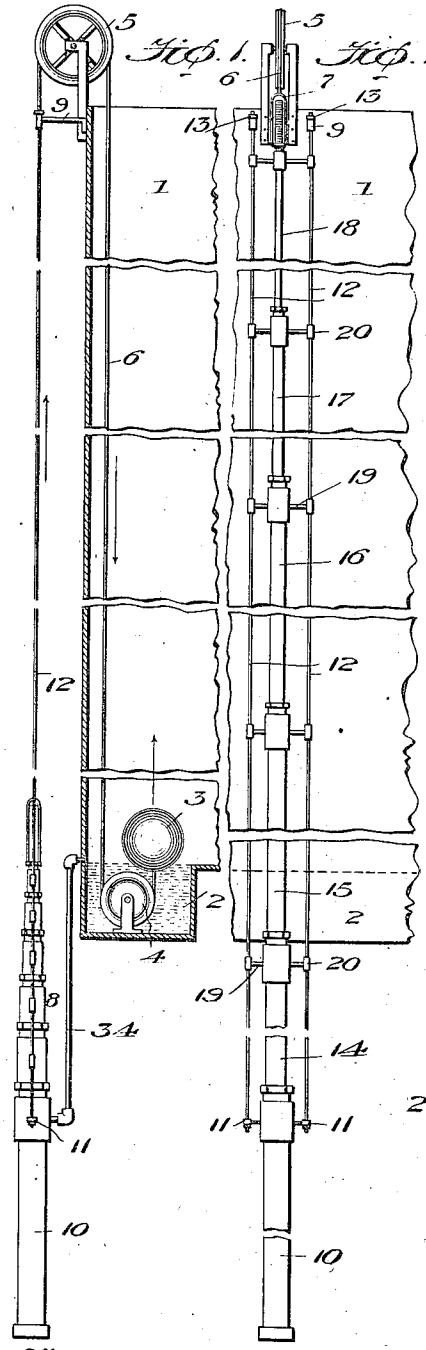

Fig. 2.

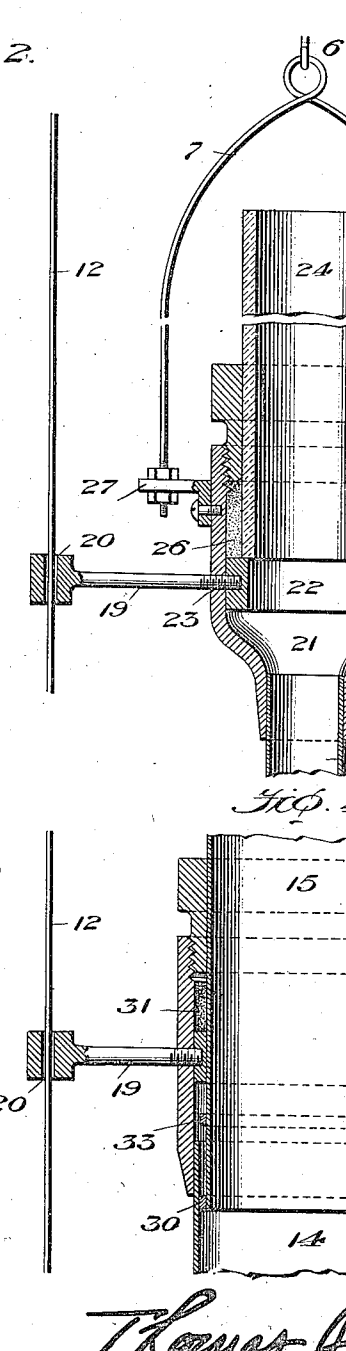

Fig. 3.

Fig. 4.

Witnesses

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TANK SIGHT-GAGE.

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Application filed July 11, 1914. Serial No. 850,417.

To all whom it may concern:

Be it known that I, THOMAS J. COLE, a citizen of the United States, residing at Guayanilla, Porto Rico, have invented certain new and useful Improvements in Tank Sight-Gages, of which the following is a specification.

This invention relates to tank sight gages.

My object is to provide an improved sight gage for tanks, particularly those tanks which are relatively large, by which the height of the surface of the fluid in the tank may be seen at all times from the exterior thereof and which will indicate different levels from the lowest to the highest.

My invention relates to that general class of gages which are float-operated and its novelty consists, first, in the general arrangement of the float, sheaves or pulleys at lower and upper parts of the tank, and a sight gage; further, in the provision of a well which contains the fluid even though the tank be completely empty, and the fluid in which is adapted to sustain the float; still further, in a sight gage for tanks embodying a plurality of telescopic sections to which the fluid in the tank has access and combined with a float in the tank for extending or permitting collapse of the telescopic sections to indicate the fluid level; also, in the combination of pulleys, float, cable or wire, and telescopic sight gage as more fully set forth hereinafter and, finally, in the particular construction of the joints for the telescopic sight tube and the manner in which the sections of the sight tube are mounted for extension and contraction.

In the accompanying drawings: Figure 1 is a side elevation, showing a portion of the tank in section and broken away, the tank being empty and the telescopic sight gage completely collapsed; Fig. 2, a side elevation showing the telescopic tube and gage in completely extended condition, as when the tank is full; Fig. 3, a detail vertical section of the upper end of the sight gage, certain parts being broken away and others in full lines; and Fig. 4, a detail vertical section of one of the slip joints of the telescopic tube.

My invention is adapted for use in connection with a tank of any size, but it is particularly adapted for use on very large tanks for containing fluids of any kind. The tank 1 is provided with a well 2 in its lower part adjacent one of its sides and below its bottom, said well being adapted to contain the fluid even after the tank is empty and to thereby sustain the ball or float 3. Suitably mounted in the well 2 is a sheave 4. Carried by a bracket at the top of the tank 1 is another sheave 5. The wire or cable 6 which is connected at one end of the ball or float 3, passes around the under side of the sheave 4 and over the upper part of the sheave 5 extending downwardly and being connected to the bail 7 by which the telescopic sections of the sight gage 8 are drawn out or allowed to telescope by gravity according as the ball or float 3 rises or falls.

Extending out from the upper part of the tank 1 are brackets 9. Secured to the lowermost section 10 of the telescopic sight gage 8 are brackets 11 corresponding to the brackets 9. Guide wires or rods 12 are suitably connected to the brackets 9 and 11 as, for instance, by nuts or clamping devices 13 by which the guide wires are kept taut between the brackets 9 and 11. The sight gage consists of a plurality of telescopic tubular sections 10, 14, 15, 16, 17, 18 of decreasing size upwardly so that they are adapted to collapse and assume the condition shown in Fig. 1, when the tank is completely empty and the float is down, and they are adapted to extend to their full limit when the float 3 is at the highest point in the tank 1, as shown in Fig. 2. The respective sections 10, 14, 15, etc., are provided with brackets 19 attached as shown in Figs. 3 and 4, and provided with sleeves or runners 20 which slide on the guide wires or rods 12.

Referring to Fig. 3, to the uppermost tube 18 is connected a head 21, in which is fitted a ring 22 held in position by the screw-threaded ends 23 of the arms or brackets 19. This ring 22 supports the glass fluid sight tube 24 which is held by a gland 25 and is packed at 26. Brackets 27 secured to the head 21 afford a connection for the bail 7 which, in turn, is connected to the wire or cable 6.

One of the joints between the telescopic sections 10—14; 14—15, etc., is shown in Fig. 4, where the lower section 14, for instance, has brazed or suitably secured thereto a stuffing box 28 into which is screwed a gland 29. The next telescopic tube immediately above, that shown at 15 for instance, is provided on its lower end with a suitable guide ring 30 which fits in the tube 14 and

minimizes friction between the tubular sections 14 and 15. Packing 31 surrounds the tubular section 15 below the gland 29 and rests upon a ring 32 which corresponds to the ring 22 and is similarly secured to the stuffing box 28 by brackets 19.

Suitably secured to and encircling the lower end of the tube 15 is a stop ring 33 which is adapted to engage the ring 32 and prevent the ring 30 from leaving the tube 14 and also prevent the sections 15 and 14 from pulling apart.

The glands 25 and 29 are provided with hexagonal nuts by which they may be screwed into position.

The lowest section 10 of the telescopic tube is connected by a pipe 34 with the tank 1 at the level of the bottom thereof and consequently, when the level of the fluid in the tank is above the top of the well 2, the fluid passes through pipe 34 and into the sight gage 8, rising to the same level as in the tank 1 and showing in the glass tube 24, thus indicating the fluid level in the tank. As the fluid level rises in the tank, the ball or float 3 rises correspondingly and, through the wire or cable 6, elevates the telescopic sight gage 8, and at all times the level of the fluid is correctly indicated in the glass tube 24. As the fluid level lowers in the tank 1, the ball 3 correspondingly lowers and the sections 14, 15, 16, 17 and 18 telescope into each other by gravity. The wires 12 constitute a guide for the telescopic sections aforesaid.

The sight gage, being located on the outside of the tank, may be readily observed and is easily accessible for packing, tightening or repairs of any kind.

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

1. In a sight-gage for tanks, the combination with a float adapted to rise and fall with the liquid level in the tank, of a hollow movable fluid display sight-gage, means placing the sight-gage in fluid communication with said tank, and means connecting the float and sight-gage, whereby the sight-gage is adapted to rise and fall with said float.

2. In a sight gage for tanks, the combination with a tank, of an exterior extensible gage composed of relatively movable sections, a float adapted to rise and fall with the level of the liquid in the tank, upper and lower sheaves, and a flexible connection between the float and the extensible gage, said connection running over the sheaves and affording means, whereby the gage is adapted to be drawn out or collapsed as said float rises and falls.

3. In a sight gage for tanks, the combination with a tank having a well extending below its bottom, of a float positioned so that it is subject to the liquid level in both the tank and the well, a hollow movable fluid display sight gage, means placing said sight-gage in fluid communication with said tank, and means operatively connecting the sight gage to the float, whereby said sight-gage is adapted to rise and fall with the float.

4. In a sight-gage for tanks, the combination with a tank having a well extending below its bottom, of a float positioned in the tank so that it is subject to the liquid level in both the tank and the well, an extensible sight-gage located exteriorly to the tank, means placing the sight gage in fluid communication with the tank, and means operatively connecting the sight-gage and float, said gage being composed of relatively movable sections and adapted to be drawn out or collapsed as the float rises and falls.

5. In a sight gage for tanks, the combination with a tank having a well extending below its bottom, of a float subject to the liquid level in both the tank and the well, an extensible sight gage located exteriorly of the tank and composed of relatively movable telescopic tubular sections, a fluid conduit connecting the interior of the tank with the interior of the said sight gage, and an operative connection between the float and the sight-gage, affording means whereby the sight-gage is adapted to be drawn out or collapsed as the float rises and falls.

6. In a sight gage for tanks, the combination with a tank, of a sight gage located exteriorly thereof and composed of tubular telescopic sections in interior fluid communication with the tank, whereby the liquid level in the tank is disclosed in the gage, and a float subject to the fluid in the tank and operatively connected to the gage and adapted to draw out the sight-gage as the fluid level rises and to permit it to lower as the said level falls.

7. The combination with a tank, of a float adapted to rise and fall with the liquid level therein, upper and lower sheaves, a sight gage consisting of a plurality of telescopic tubular sections, said gage having a sight tube to display the liquid level, means placing said telescopic sections in fluid communication with the interior of the tank, and a flexible connection between the float and the sight gage, said connection running over the aforesaid sheaves and affording means whereby the sight-gage is adapted to be drawn out or collapsed as the float rises and falls.

8. The combination with a tank, of an extensible sight gage therefor consisting of relatively movable sections, guides for said sections, and a float subject to the fluid level in the tank, said float having an operative connection with the sight-gage whereby the gage is extended or contracted as the float rises and falls.

9. The combination with a tank, of a sight gage consisting of a plurality of telescopic tubular sections having a sight tube and guides, runners connected to the sections and slidable on the guides, and a float subject to the liquid level in the tank which has an operative connection with the sight-gage, whereby the gage is extended or contracted as the float rises and falls.

10. The combination with a tank having a well extending below its bottom, of a sheave mounted below the bottom of the tank, an upper sheave, an exterior sight gage consisting of a plurality of tubular telescopic sections having a sight tube, a float adapted to rise and fall in the tank, a flexible connection between the float and the sight gage and running over the sheaves aforesaid, whereby the gage is extended or contracted as the float rises and falls, guides, runners connected to the telescopic sections and traveling on the guides, and means affording communication between the bottom of the tank and the interior of the sight gage.

In testimony whereof, I hereunto affix my signature in presence of two witnesses.

THOMAS JOSEPH COLE.

Witnesses:

F. ZAPATER,

ALISER PHILIP.