

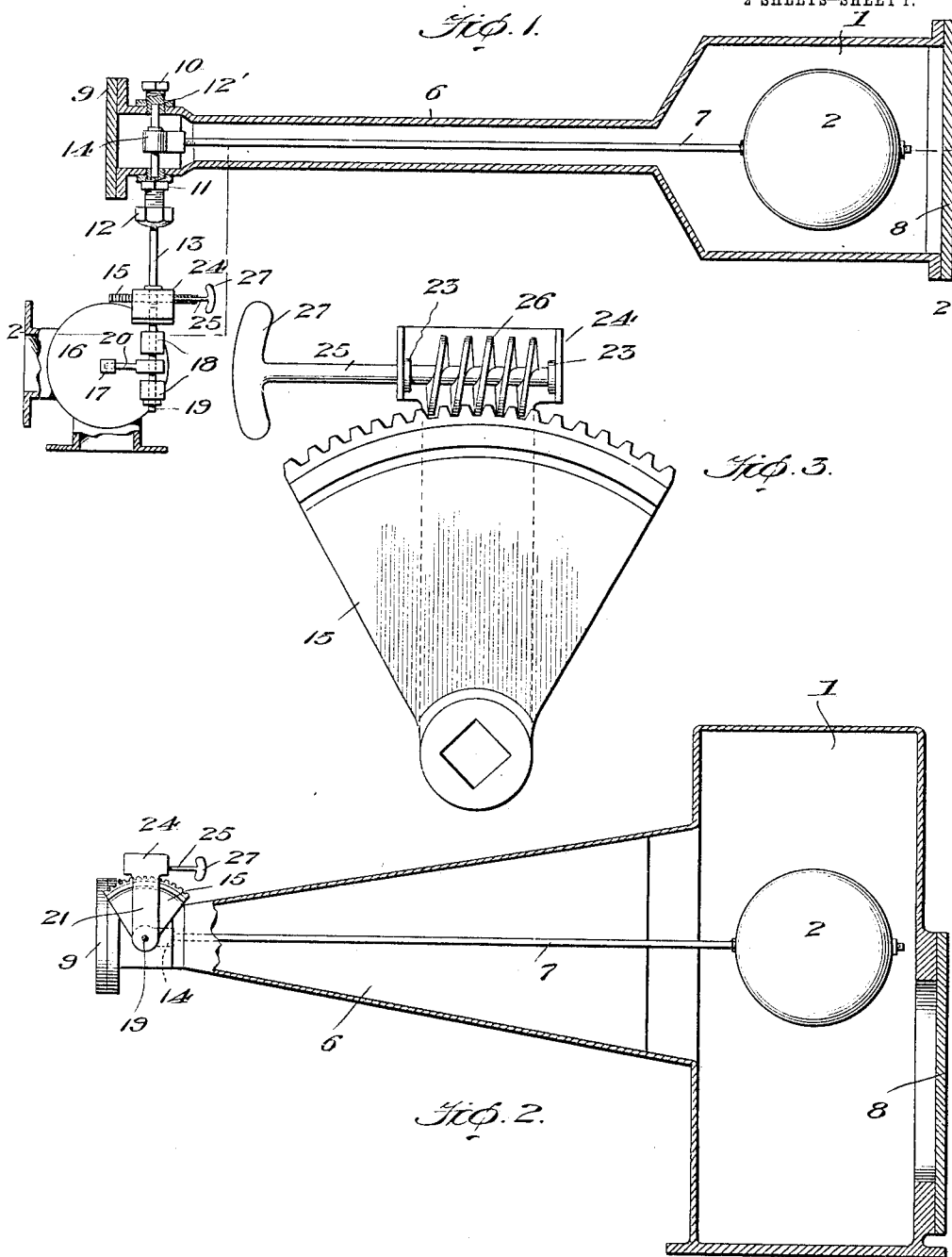
T. F. SANBORN.
FLOAT OPERATED LIQUID REGULATOR.

APPLICATION FILED JAN. 26, 1912. RENEWED DEC. 19, 1913.

1,085,166.

Patented Jan. 27, 1914.

2 SHEETS—SHEET 1.



WITNESSES

[Signature]
W. L. Newcomb.

INVENTOR

Thornton F. Sanborn
By *[Signature]* Attorney

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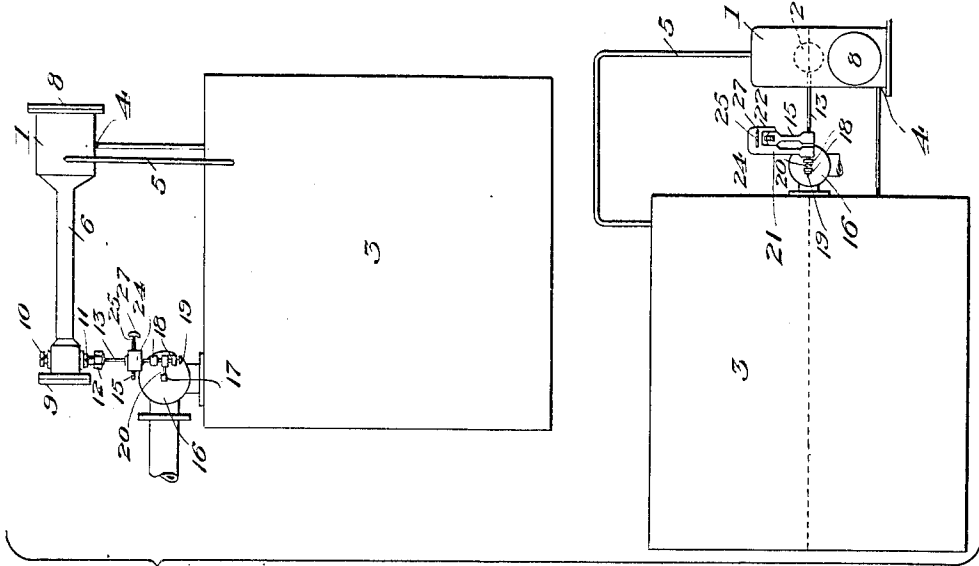


Fig. 6.

Fig. 5.

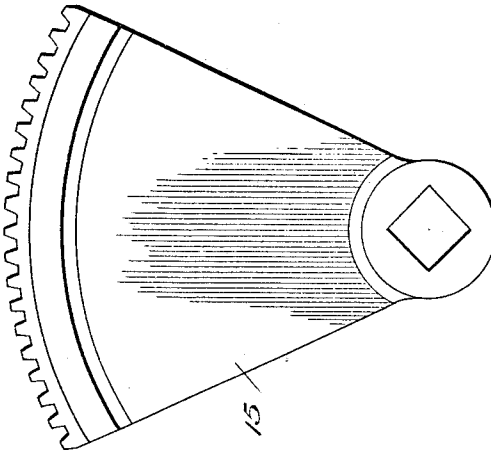
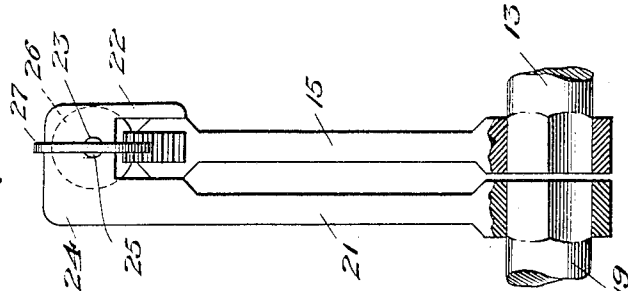


Fig. 4.



WITNESSES

Wm. H. Newcomb

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UNITED STATES PATENT OFFICE.

THORNTON F. SANBORN, OF ENSENADA, PORTO RICO, ASSIGNOR TO SANBORN EVAPORATOR COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

FLOAT-OPERATED LIQUID-REGULATOR.

1,085,166.

Specification of Letters Patent.

Patented Jan. 27, 1914.

Application filed January 26, 1912, Serial No. 673,637. Renewed December 19, 1913. Serial No. 807,776.

To all whom it may concern:

Be it known that I, THORNTON F. SANBORN, a citizen of the United States, residing at Ensenada, Porto Rico, have invented certain new and useful Improvements in Float-Operated Liquid-Regulators, of which the following is a specification.

This invention relates to float-operated liquid regulators.

10 The object of the present invention is the provision of a float-operated apparatus applicable to the inside or outside or arranged partly inside and partly outside of any open or closed liquid container of any kind and
15 connected to either the inlet or outlet thereof which may be adjusted at will, preferably from the outside of the container, to regulate, as may be desired, the level at which the device will maintain constant the
20 liquid in the container and which will permit, by such regulation, the liquid level to be maintained at any desired height.

The invention consists of a float, a valve controlled thereby, and an intermediate adjustable connection, which may be changed or regulated at will without interfering with the continued operation of the device, whereby the valve may be made to open or close, or partially so, by the rise and fall of the
30 float and thus the apparatus may be set or changed to maintain at any desired height the liquid level in any container to which it may be connected or applied.

The invention consists, secondly, in a particular adjustable connection interposed between a valve and a float, in an apparatus of the character set forth.

In the accompanying drawings: Figure 1 is a sectional plan of the apparatus alone;
40 Fig. 2, a vertical section, partly broken away, taken on line 2—2, Fig. 1; Figs. 3, 4 and 5, details of the adjustable connection embodying the worm and the gear sector; and Fig. 6, a view showing one way
45 in which the apparatus may be connected to a fluid container.

The apparatus may be located wholly within, wholly without, or partially within and partially without the fluid container or
50 receptacle whose liquid level it is designed to maintain and it may control either the outlet or the inlet of said receptacle.

Preferably there is provided a float box 1 having such a height as will enable the
55 float 2 to rise and fall therein to the degree

which may be necessary. A pipe leading to the liquid container 3 connects with the float box 1 at 4 and, preferably, an equalizing pipe 5 connects the upper part of the float box with a point on the liquid container or receptacle 3 above the maximum
60 height of liquid in said receptacle.

The float box has a lateral tapering extension 6 in which the float arm or rod 7 is adapted to vibrate. Preferably there are
65 provided for the float box and the end of the extension 6 removable closures 8 and 9 which permit assembly of the mechanism or access thereto at any time.

Screwed into one side of the end part of
70 the extension 6 is a pivot or bearing plug 10 and opposite thereto there is screwed into the extension 6 a bushing 11 to which is connected a gland 12. Journalled in the bushing 11 and having its end received in
75 a recess 12' in the plug 10 is a spindle 13 which has a coupling or arm 14 into which the float rod 7 screws or to which it is suitably attached.

Secured to the spindle 13 is a gear sector
80 15 and in consequence every change in position of the float 2 is communicated to the spindle 13 and to the gear sector 15.

At 16 is a valve casing which may be interposed in either the inlet or the outlet of
85 the container 3 or the pipe line leading to or from the receptacle whose liquid level is to be controlled. The stem of the valve which operates in the casing is shown at 17. Secured to the valve casing in any suitable
90 manner and position are lugs or bearings 18; journalled in said bearings is a valve operating spindle 19 which has an arm 20 whose free end is operatively connected to the stem 17 in any preferred manner, as, for
95 instance, by being received in a recess in said stem or between lugs thereon. Secured to the spindle 19 is an arm 21 which preferably is provided with a bifurcated part 22
100 loosely receiving the gear segment 15. Mounted in suitable bearings 23 on the head 24 of said arm 21 is the shaft 25 of a worm 26 which meshes with the teeth of the gear sector 15. A suitable handle or finger piece
105 is provided on the shaft 25 of the worm.

The worm 26 and the gear sector 15 constitute the sole connection between the spindles 13 and 19 and consequently any turning of the worm 26 by manipulating the finger
110 piece or handle 27 results in shifting of the

arm 21 and of the stem 17 so that an adjustable connection is thereby provided between the float 2 and the valve stem 17 by which the parts may be so set that the rise of the fluid in the float box 1 to any predetermined height and consequently the rise of the fluid in the container 3 to a corresponding height may be availed of to cause closing, or opening, of the valve whose stem is shown at 17. The shifting of the arm 21 in relation to the gear sector 15 may be accomplished because of the buoyancy of the float in the liquid preventing the float being depressed with the short leverage and the weight of the float making it impossible to lift it with such a short leverage when the handle or finger piece 27 is turned. Worm gearing is self-locking and therefore once the adjustment of the arm 21 and the valve has been effected by turning the worm 26, such adjusted condition is maintained and consequently, after such adjustment and setting of the valve, the latter will operate to maintain the desired level of the liquid in the container by letting in or letting out, as the case may be, the necessary flow of the liquid to maintain such constant level. The adjustment of the valve may be accomplished at will at any time without disconnecting any part of the apparatus and, as it is preferable to locate at least the handle 27 or other operating device for the worm 26 outside the fluid container whose liquid level is being controlled, change of maintenance of the liquid can be quickly had while the apparatus is in operation without having to have access to the interior of the liquid container.

I wish it understood that I do not limit myself, except where stated in the claims, to the use of the particular adjusting means set forth which comprises the worm and the gear sector as, in its broadest aspect, my in-

vention consists in the provision, in connection with an inclosed float and a valve, of exposed means for adjusting the connection between them whereby the valve may be set to open or close or to move between certain limits as may be predetermined by whoever has control of the apparatus.

I also claim the particular means set forth, comprising the worm and the gear sector, as a self-locking adjusting device interposed between a float and a valve, where so stated in the claims.

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

1. In a float operated liquid regulator, the combination with a float and a pivoted arm therefor, of a valve, a worm gear and an arm both arranged to turn on an axis co-axially with the pivotal point of the float, one being connected to the float arm and the other to the valve, and a worm carried by the arm and engaging with the worm gear, said worm being adapted to be turned to set the arm and gear in different relative positions and constituting the sole connection between said arm and gear.

2. In a float-operated liquid regulator, the combination with a float, of a valve controlled thereby, and an intermediate manually adjustable self-locking connection embodying a worm and a gear meshing therewith whereby the relation of the valve to the float may be changed, said worm and gear constituting the sole connection between the valve and float.

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

THORNTON F. SANBORN.

Witnesses:

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M. L. HARTWIG.