June 19, 1923. 1,458,965

R. S. BASSETT

LIQUID METER

Filed April 7, 1922

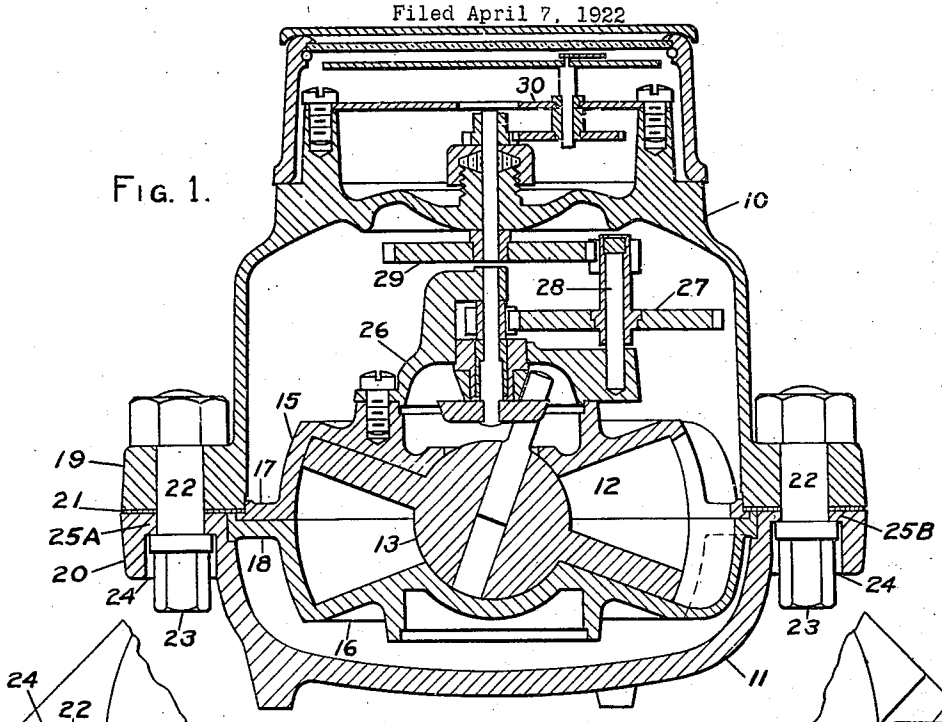

FIG. 1.

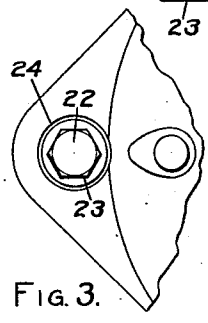

FIG. 3.

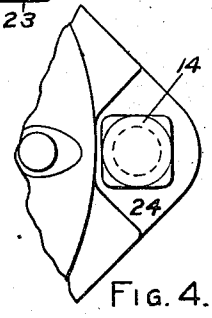

FIG. 4.

FIG. 2.

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ROBERT S. BASSETT, OF BUFFALO, NEW YORK.

LIQUID METER.

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To all whom it may concern:

Be it known that I, ROBERT S. BASSETT, a citizen of the United States of America, and a resident of the city of Buffalo, county of Erie and State of New York, have invented certain new and useful Improvements in Liquid Meters, of which the following is a full, clear, and exact description.

My invention relates generally to meters used in the measurement of liquids and more particularly to the disc type of meter.

The principal object of my invention has been to provide a meter of such a design that minimum damage will be caused to the meter by the freezing of the liquid which it contains.

My meter is so designed that a predetermined less expensive part will fail thus releasing the internal measuring mechanism from its fixed position, without damage thereto.

Another object has been to so control the failure of the predetermined less expensive part that the displacement of the internal mechanism will be effected without damage to, or distortion of, any of the parts, especially the intermediate gear train.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings of which—

Fig. 1 is a vertical sectional view through my complete device, showing all parts in their working position.

Fig. 2 is a vertical sectional view through the main casing of my device after failure of the frangible portions of the bottom casing due to abnormal pressure within the meter, such as would be caused by the freezing of the liquid which it contains, showing the usual separation of the parts carried by the bottom casing.

Fig. 3 is a fragmentary bottom view of one corner of the main casing joining flange and shows the head 23 of the bolt 22 as located within a counterbored recess 24.

Fig. 4 is a fragmentary bottom view of one corner of the main casing joining flange and shows a variation in the construction, the bolt being a standard square head machine bolt 14, and the recess 24 a cast recess open on the outer side.

In the drawings, 10 represents the top casing and 11 the bottom casing. 12 is the disc chamber, which is of the usual and well known type, having a disc 13. The disc chamber comprises an upper part 15 and a lower part 16. Each of the parts 15 and 16 is shown provided with a suitable mounting flange 17 and 18, respectively. The flange 17 rests upon the flange 18, which latter flange is preferably mounted in a counterbored recess in the bottom casing 11, whereby, when the bottom casing is forced downwardly and released, by abnormal pressure within the meter, such as by freezing of the liquid, the measuring mechanism will be allowed to move from its fixed position without injuring the same. Since the parts 15 and 16 of the disc chamber are not fastened together it will be obvious that these two parts will also be free to separate when freezing occurs.

The top casing 10 is provided with a flange 19, and the bottom casing 11 is likewise provided with a flange 20. These flanges preferably extend around the casing parts and arranged between them is a gasket 21. The bolts 22, 22, for holding the flanges 19 and 20 together, will pass through the flanges and gasket at suitable intervals, and will be four in number in a house size meter. As shown in the form of device of Figures 1 to 4 inclusive, the head 23 of the bolt 22 is disposed within a counterbored recess 24. The depth of this recess is such as to leave the metal above it in the form of a thin wall 25^A and 25^B, which provides the weakened part of the casing 11, which will break when undue presure within the meter is caused by the freezing, or partial freezing, of the liquid it contains. Since the bolts are passed through the flanges with the gasket 21 disposed therebetween, it will be seen that the bolts may be tightened the necessary amount without danger of breaking the weakened portion of the casing 11. Due to this construction, it will be seen that when the meter is to be used under conditions where the breakable feature is desired, the bolts 22 with their special head 23, as shown in the drawings, may be used. If, however, the meter is to be used where the protection

against extreme damage by freezing is not desired, bolts with larger heads may be employed, the heads bearing on the outside lower surface of the flange 20, instead of entering the counterbored recess 24 and bearing on the walls 25^A and 25^B as shown in the drawings. This interchangeable feature makes it possible to have but one bottom casing for the two types of meters.

The recess 24 is shown as a circular recess, and this type would be extremely suitable because, if desired, the recess could be machined to the exact desired depth, though it may also be cast in the flange 20 in other shapes as shown in Figure 4. The exact style of this recess, however, is not limited to the styles shown. In Figure 4 the recess 24 in the flange extends out to the outer corner of the flange, which makes it more of the form of a notch in the flange rather than a pocket, and such a form would be easier to cast.

Arranged above the disc chamber 12 and supported by the part 15 thereof, is the gear plate 26 of the meter, on which is mounted the intermediate gear train. Intermediate train gear 27 is shown mounted on the gear pivot 28 in the usual manner and engaging the top gear 29 to transmit the motion of the measuring chamber disc to the registering device 30 of my meter. This registering device with its connected gearing is common and well known in the art and will not, therefore, be further described.

The metal at the bottom of the recess in the form of the thin flange walls 25^A and 25^B is shown as of two thicknesses, the flange wall on the side of the meter containing the intermediate train gear 27 being thinner and marked 25^B, while the flange wall on the side of the meter opposite the train gear 27 is thicker and marked 25^A. As shown in Figure 2, the thinner flange wall 25^B will break first, allowing the bottom casing 11 to swing as on a hinge around flange wall 25^A, eventually breaking this wall, as shown. This action, as though the bottom casing 11 were mounted on a hinge, causes the train gear 27 to become disengaged from the top gear 29 without damage, while if the flange walls 25^A and 25^B were all made of the same thickness the bottom casing 11 might swing at any angle, and if it should swing in the reverse direction from that shown, the train gear 27 would be forced against the top gear 29, and the gear plate 26 and other parts of the meter might be distorted from their proper shape.

As the house size meter has four bolts the two bolts nearest the train gear 27 will pass through the thin flange walls as 25^B, while the two bolts farthest from the train gear 27 will pass through the thick flange walls as 25^A. In case of a meter with six bolts, which would be the extreme number for this style of frost bottom meter, four bolts would bear on thin flange walls, and two bolts on thick flange walls, which would cause the bottom casing 11 to move as around a hinge after failure at the four bolts bearing on the very thin flange walls as 25^B. This feature of controlling the relative motion of the train gear 27 and the top gear 29 is novel and the exact form for obtaining this motion should not be limited to the construction shown, as any construction whereby the side of the bottom casing 11 nearest the train gear 27 is made slightly weaker than the side of the bottom casing 11 farthest from the train gear 27, will bring about the same results and will cause the train gear 27 to properly disengage from the top gear 29 without damage to, or distortion of, any of the parts 26, 27, 28 or 29. This overcomes the necessity of fastening the intermediate gear train to the top casing 10, as is usual where all breaking points of the bottom casing 11 are equally weak.

Obviously, some modifications of the details herein shown and described may be made without departing from the spirit of my invention, or the scope of the appended claims; and I do not wish, therefore, to be limited to the exact embodiment herein shown and described, the form described being merely a preferred embodiment thereof.

The recess 24 might be located in the top casing 10, and the position of the bolts reversed, if it is desired to replace the top casing 10, rather than the bottom casing 11.

Having thus described my invention, what I claim is:

1. A liquid meter comprising a top casing, a bottom casing, meeting flanges for said casing parts, the flange of one of said parts having perforations and recesses surrounding said perforations to provide frangible portions, and fastening means passing through said flanges and recessed portions; substantially as and for the purpose described.

2. A liquid meter comprising a main casing, an internal measuring mechanism, and means for holding said mechanism in place, said means having a predetermined breakable section with certain portions of minimum strength and certain portions with materially increased strength, so that at a certain predetermined pressure the breakable section will fail at the extremely weakened sections and will move as if hinged on said portions of slightly increased strength; substantially as and for the purpose described.

3. A liquid meter comprising a top casing, a bottom casing, an internal measuring mechanism, an intermediate train of gears having bearing on said top casing and said internal measuring mechanism, and frangible means of predetermined different

strengths for holding said internal measuring mechanism in place, the part of said intermediate train of gears mounted on said internal measuring mechanism engaging the part of said intermediate set of train gears mounted on said top casing, at a point generally diametrically opposite to that frangible portion of said holding means of greatest strength; substantially as and for the purpose described.

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Witnesses:
W. J. CHELLEW,
CHAS. K. BASSETT.