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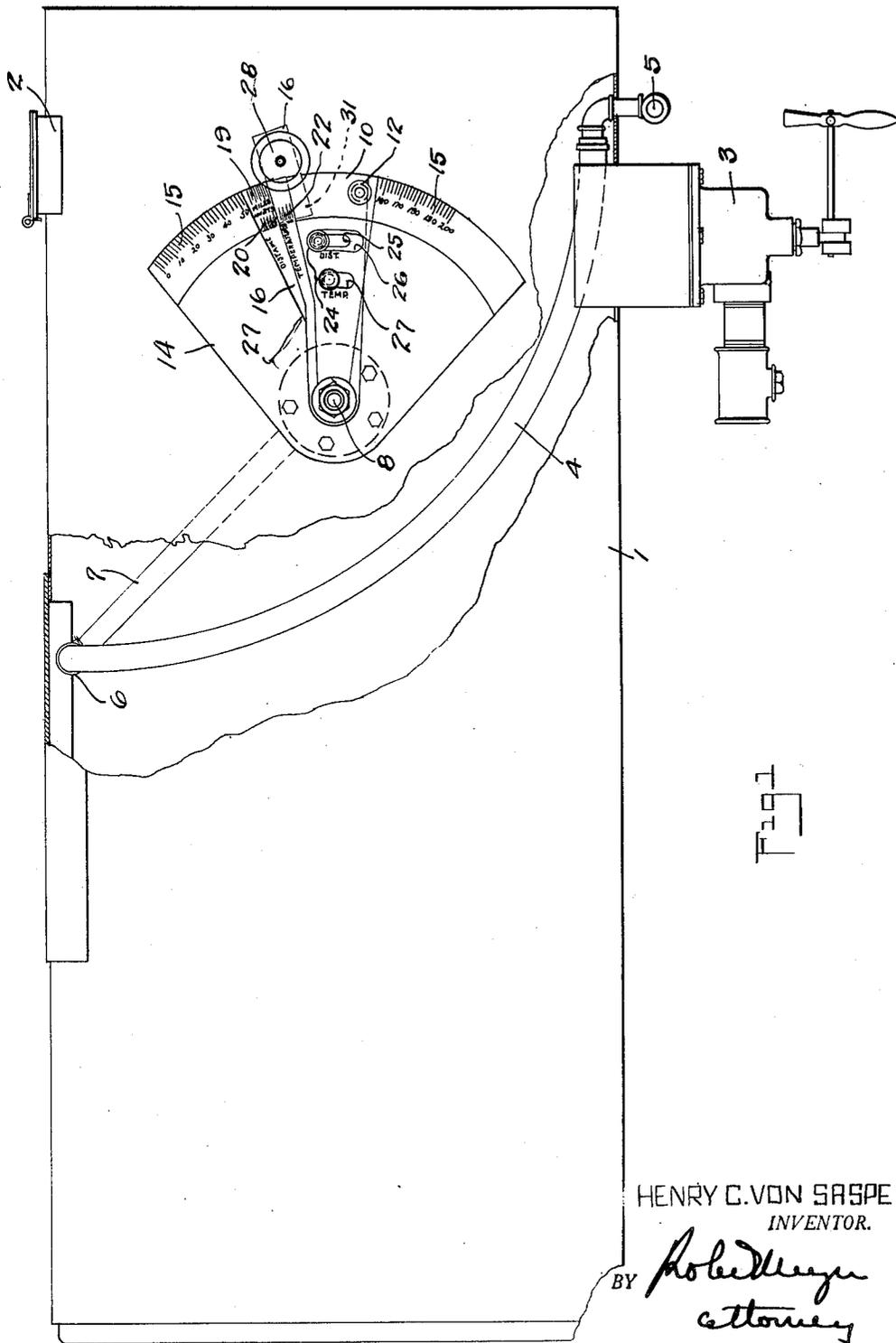
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2,543,883

SLUMP METER FOR TRUCK CONCRETE MIXERS

Filed Sept. 15, 1945

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

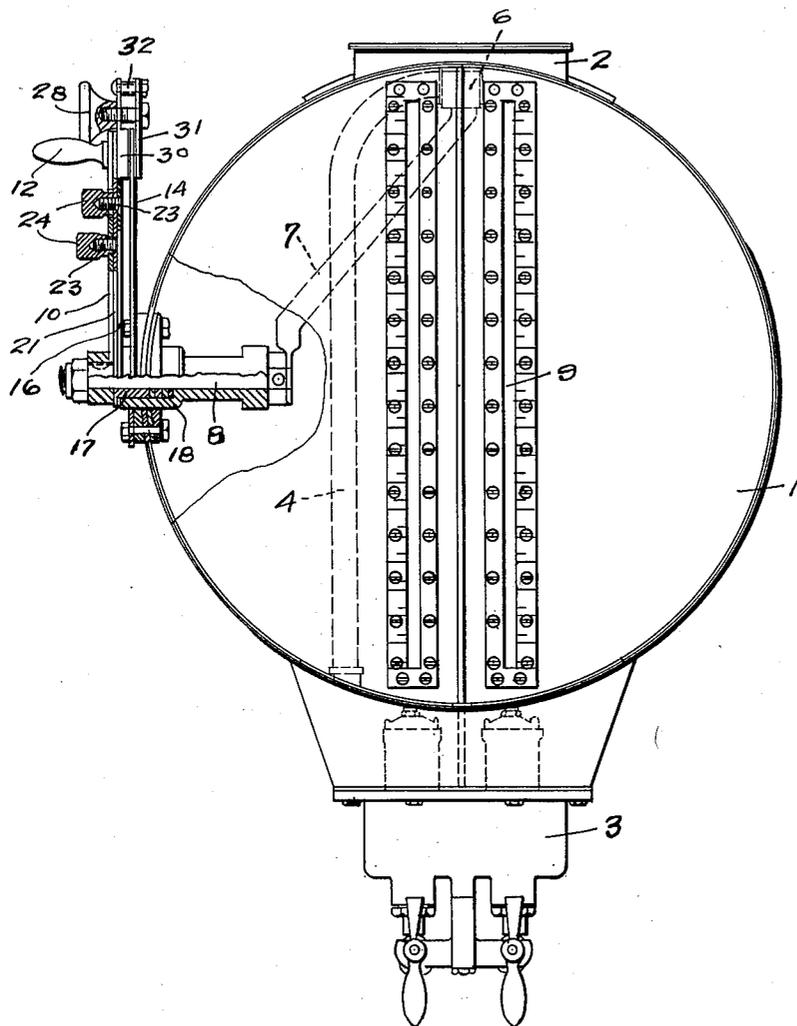


Fig 2

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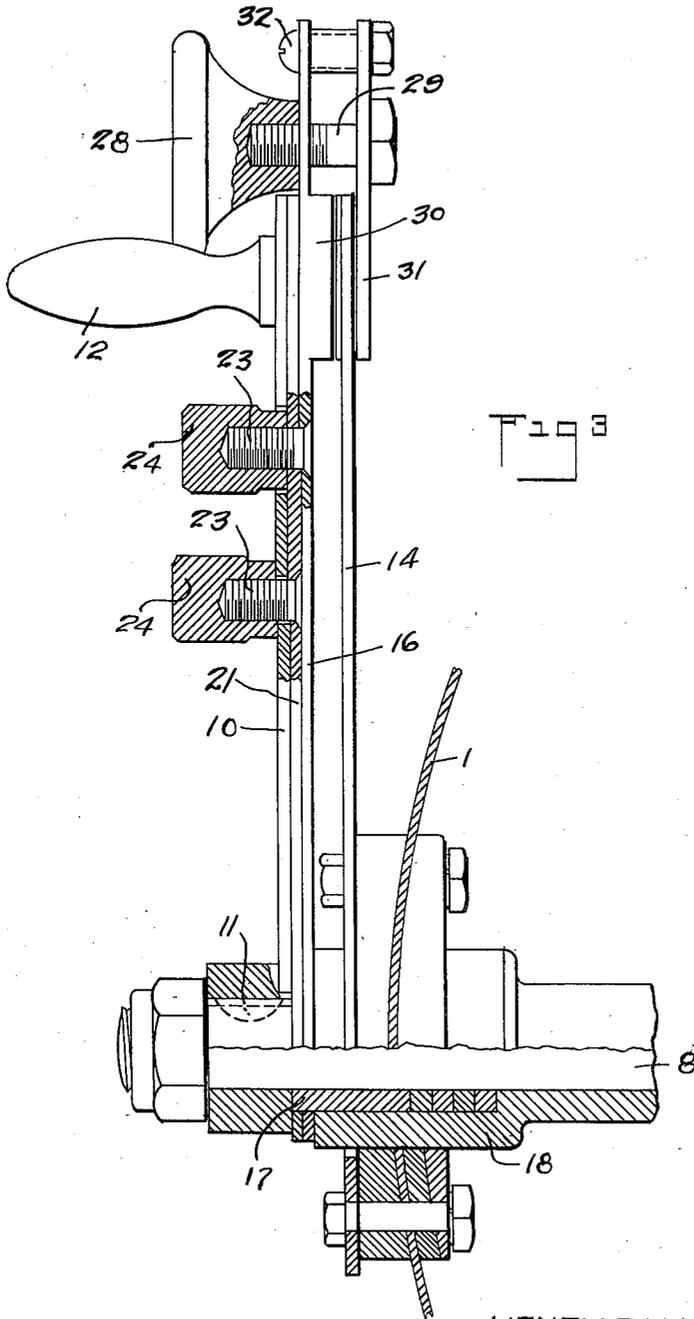
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SLUMP METER FOR TRUCK CONCRETE MIXERS

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UNITED STATES PATENT OFFICE

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SLUMP METER FOR TRUCK CONCRETE MIXERS

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by mesne assignments, to Worthington Pump
and Machinery Corporation, Harrison, N. J., a
corporation of Delaware

Application September 15, 1945, Serial No. 616,520

10 Claims. (Cl. 137—21)

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This invention relates to truck or portable concrete mixers, and more particularly to a meter for controlling the water content of the concrete mixture for providing the desired or specified slump of the mixture at its point of use.

An object of the present invention is to provide a slump meter which will assure the maintenance of specified slump in concrete mixture over various periods of time encountered between travel from a batching plant to a delivery destination.

Another object of the present invention is to provide a slump meter for use on concrete mixers of the truck type which may be set in accordance with the distance to be traveled from the batch plant or point of loading to the delivery destination; and also in accordance with atmospheric temperature so as to provide an excess quantity of water in the tank of the mixer for mixing with the batch during travel to compensate for evaporation and moisture absorption encountered during travel so that the concrete mixture will be within the consistency of specifications when delivered.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a slump meter for truck concrete mixers of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is a view in front elevation of the improved slump meter showing it applied to the water tank of a truck concrete mixer.

Figure 2 is a view partly in section and partly in edge elevation of the improved slump meter showing it applied to the water tank of a concrete mixer.

Figure 3 is an enlarged view partly in section and partly in edge elevation of the improved slump meter.

In the use of truck concrete mixers, the truck mixing drum receives its load of concrete ingredients at a batch plant or loading point from which it travels to the destination of use of the concrete. The distance from the batch plant to the point of use may be within a twenty-five to fifty mile radius, and, depending upon the season, atmospheric temperatures from zero to approximately 100° F. may be encountered during the travel to the point of destination. During the travel of the mixer, water is delivered into the drum which rotates in the usual well known man-

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ner to mix the water and concrete ingredients. During travel under various conditions, as above indicated, moisture absorption and evaporation affects the slump content of the mixture, causing it to fall below the standard specified tolerance of one-half inch plus or minus in slump. In short distances, this variance is not vital, but in longer distances it affects the slump content of the mixture and causes it to fail to meet the specified requirements.

The slump meter of the present invention comprises means for providing an excess quantity of water in the water tank in proportion to the distance to be traveled and the temperature encountered during such travel so as to maintain the slump content of the concrete within the specified tolerances at the point of delivery.

The improved slump meter is shown in the drawings as applied to a water tank construction for concrete mixers which is shown in my co-pending application Serial No. 587,528, filed April 10, 1945, now Patent No. 2,526,520 of October 17, 1950. As disclosed in this prior application, the tank 1, which it is understood, of course, is mounted on what is known as a truck or portable concrete mixer (not shown), is filled with water through a filling opening 2, and the water is dispensed from the tank 1 through the dispensing valve structure 3 which is specifically illustrated and described in the above-mentioned application. The quantity of water retained in the tank is controlled by the adjustment of the overflow mechanism so that no care need be taken in delivering the water to the tank, and neither need the water be measured, neither before nor after it is delivered to the tank.

The overflow mechanism comprises a flexible overflow hose 4 having an outlet 5 below the tank so that the water flowing therefrom will go to waste. An inlet head 6 is connected to the inner upper end of the flexible hose 4 and it is carried by the pivoted arm 7. The pivoted arm 7 is connected to the operating shaft 8 so that by rotation of the shaft 8 the inlet head 6 will be positioned at various levels within the tank 1 to control the quantity of water within the tank. Any water in excess of the water indicated on the gauge glasses 9 and the position of the inlet head 6 will overflow from the tank through the overflow outlet 5.

The present invention comprises the means for rotating the shaft 8 and accurately setting the inlet head 6 so as to regulate within a practical degree of accuracy the gallonage of the water content in the tank 1.

The shaft operating mechanism comprises a

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lever 10 which is keyed to the shaft 8 as shown at 11 and has an operating handle thereon by means of which the lever may be moved on its pivot over the outer face of the quadrant 14. The quadrant 14 has indicia 15 thereon which indicates the gallonage content of the tank with the lever 10 and consequently the inlet head 6 at various positions.

As hereinabove stated, the slump of the concrete mix varies during the length of time consumed in traveling from the batching plant to the destination of use of the concrete, both due to absorption and evaporation. Therefore, the slump meter of the present invention comprises means to provide for the setting of the lever 10 and the inlet head 6 in proportion to the distance to be traveled and the temperature encountered during such travel to provide an excess quantity of water in the tank to insure the proper slump of concrete mix at the point of use. For this purpose, a distance compensating lever or arm 16 is pivotally mounted on the sleeve 17. The sleeve 17 is mounted about the shaft 8 and within the bearing 18 of the shaft, as clearly shown in Figure 3 of the drawings. The arm or lever 16 has an outer set of graduations 19 thereon graduated to indicate the miles of travel, and an inner set of graduations 20 to indicate the time absorbed during such mileage traveled. A second arm or lever 21 is also pivotally mounted on the sleeve 17, and it has a set of graduations 22 thereon to indicate atmospheric temperature. Both the distance compensating lever or arm 16 and the temperature compensating arm or lever 21 have threaded studs 23 thereon on which are threaded locking caps 24 which engage the operating lever 10. The stud 23 and the locking cap 24 carried by the distance compensating lever 16 are movable in a slot 25 formed in the temperature compensating lever 21 and in a slot 26 formed in the operating lever 10, while the stud 23 carried by the temperature compensating arm or lever 21 is movable in a slot 27 formed in the operating lever 10, so that the distance compensating lever 16 and the temperature compensating lever 21 may be moved independently of each other and of the lever 10 to indicate, in connection with the graduations 15, the distance to be traveled and atmospheric temperature encountered during the time of travel so as to allow for the necessary and desirable increase in the quantity of water retained in the tank 1 when it is filled to maintain the proper slump of the concrete mixture when it reaches the point of use of concrete.

After the distance and temperature compensating levers 16 and 21 have been moved relative to the forward or front edge 27 of the lever 10 to indicate the proper distances and temperature, they are clamped to the lever 10 by means of the clamping caps or nuts 24 so as to prevent their displacement or consequent displacement of the inlet 6 during travel of the concrete mixer. The lever 10 is locked in position relative to the quadrant 14 through the medium of a manually adjusted locking head 28 which is threaded upon a bolt 29 to clamp the quadrant 14 between the clamping portion 30 on the distance compensating lever and the back plate 31. The back plate 31 is connected at its outer edge to the distance compensating lever 16 by a suitable bolt and sleeve connection 32, as clearly shown in Figure 3 of the drawings.

It will be understood that the invention is not to be limited to the specific construction or ar-

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angement of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed:

1. Means for regulating the quantity of water in the water tank of a concrete mixer comprising an operating shaft, a gallonage indicating quadrant, an operating lever connected to said shaft and movable over said quadrant, a temperature indicating lever movable relative to said shaft and gallonage indicating lever, a distance indicating lever movable relative to said shaft and gallonage indicating lever, means for independently locking said temperature indicating lever and said distance indicating lever in adjusted positions relative to said gallonage indicating lever and said quadrant to position said gallonage indicating lever and shaft in position to provide a predetermined excess quantity of water in the tank over the gallonage indicated by the gallonage indicator.

2. Means for regulating the quantity of water in the water tank of a concrete mixer comprising an operating shaft, a gallonage indicating quadrant, an operating lever connected to said shaft and movable over said quadrant, a temperature indicating lever movable relative to said shaft and gallonage indicating lever, a distance indicating lever movable relative to said shaft and gallonage indicating lever, means for independently locking said temperature indicating lever and said distance indicating lever in adjusted positions relative to said gallonage indicating lever and said quadrant to position said gallonage indicating lever and shaft in position to provide a predetermined excess quantity of water in the tank over the gallonage indicated by the gallonage indicator, and means for locking said gallonage indicating lever in adjusted positions relative to said quadrant.

3. Means for positioning the regulating member in the water tank of a portable concrete mixer comprising a fixed plate having graduations thereon in volumetric units, a shaft rotatably mounted in said plate, said shaft being capable of connection to said regulating member to actuate the same, a lever overlying said plate and fixedly connected to said shaft, a first arm rotatably mounted on said shaft and having graduations thereon in units of time, a second arm rotatably mounted on said shaft and having graduations thereon in volumetric units which indicate the rate at which water is transferred between air and water at different atmospheric conditions, means for fixedly connecting said lever to said plate, means for fixedly connecting said first arm to said lever, and means for fixedly connecting said second arm to said lever, said lever and said arms each having reference points thereon whereby they may be connected in predetermined positions relative to each other and to said plate.

4. An adjuster for the overflow member in the water tank of a portable concrete mixer comprising first means attachable to the overflow member for moving the same, said first means having a reference point thereon, a scale graduated in volumetric units and arranged to coact with the reference point of said first means to indicate the volume of water in the tank corresponding to various positions of the overflow member, second means for indicating in volumetric units the probable variation in the water content of the slump in the concrete mixer due to evaporation or absorption of water during the period elapsing

between loading of the mixer and discharging thereof, and third means for connecting said first and second means in fixed position relative to each other and to said scale in such a manner that said reference point is offset from the basic and desired water volume setting on the scale by an amount equal to the probable variation indicated by said second means.

5. In combination with a movable overflow member for the water tank of a portable concrete mixer, first means for indicating the volume of water in the tank at various positions of the overflow member, second means for setting the overflow member at predetermined positions, a variable width compensator having sides thereof coating with each of said means to offset said second means from a predetermined position relative to said first means, said compensator being calibrated so that variations in its width correspond to variations in the water content of the slump in the mixer due to contact with the atmosphere, and means for fixing said compensator at a predetermined width to at least one of said means.

6. In combination with a movable regulating member for the water tank of a portable concrete mixer, a scale having indicia thereon for indicating the specified quantity of water to be added to the slump in the concrete mixer, means coating with said scale for positioning said regulating member, a compensator having one side coating with the indicia on said scale and the other side coating with said means to offset the latter from that position on the scale whereat the regulating member would be positioned to provide the specified amount of water, said compensator being of an adjustable dimension between said sides and having means associated therewith for adjusting that dimension so that it represents in terms of the scale indicia the pre-calculated transfer of water between the atmosphere and mixer during the period between loading and discharge of the mixer whereby said compensator offsets said positioning means by the amount of the calculated variation in the water content with the result that the regulating member is positioned so that the combined quantity of water transferred between the tank and atmosphere and the slump substantially equals the specified quantity of water to be delivered to the slump.

7. A regulator for adjusting the position of the regulating pipe of a concrete mixer water tank comprising a plate member having an arcuate scale for indicating the specified quantity of water to be added to the slump in the mixer, a shaft rotatably mounted in said plate member and capable of being connected to the regulating pipe to actuate the same, a lever member fixed to said shaft and having an edge coating with the scale to provide means for setting the regulating pipe at a specified volume position, means for locking said lever member relative to said plate member, a first rotatable arm having an arcuate scale for indicating the time between loading and unloading of the concrete mixer, a second rotatable arm having an arcuate scale for indicating the rate at which water is evaporated from the mixer under various atmospheric conditions, said arms being arranged so that the scale on one coats with the edge of the other and with the scale on the plate member and so that the scale on the other also coats with the edge of the lever mem-

ber, and means for locking said arms to at least one of said members.

8. In combination with a movable regulating pipe for a fluid tank, a member having a scale for indicating the position of the regulating pipe, a lever member having a driving connection with the overflow pipe, first means movable with said lever member and cooperable with said scale for indicating the position of said lever member and said regulating pipe, locking means for fixing the position of said lever member relative to said scale, parts movable relative to each other and to said members, said parts having graduations thereon and reference point means thereon cooperating with these graduations as well as with said first means and the member scale whereby said parts may be moved predetermined amounts relative to each other and to said members, and means for locking said parts to at least one of said members whereby the distance between the point of association of said reference point means with said scale and the point of association of said reference point means with said first means may be fixed at a predetermined value.

9. Means for regulating the quantity of water in the water tank of a concrete mixer comprising, an operating shaft, a gallonage indicating quadrant, an operating lever connected to said shaft and movable over said quadrant, a sleeve rotatably mounted on said shaft, a temperature indicating lever mounted on said sleeve, a distance indicating lever mounted on said sleeve and movable independently of said temperature indicating lever, means for independently locking said temperature indicating lever and said distance indicating lever in adjusted positions relative to said gallonage indicating lever and said quadrant to position said gallonage indicating lever and shaft in position to provide a predetermined excess quantity of water in the tank over the gallonage indicated by the gallonage indicator.

10. Means for regulating the quantity of water in the water tank of a concrete mixer comprising, an operating shaft, a gallonage indicating quadrant, an operating lever connected to said shaft and movable over said quadrant, a sleeve rotatably mounted on said shaft, a temperature indicating lever mounted on said sleeve, a distance indicating lever mounted on said sleeve and movable independently of said temperature indicating lever, means for independently locking said temperature indicating lever and said distance indicating lever in adjusted positions relative to said gallonage indicating lever and said quadrant to position said gallonage indicating lever and shaft in position to provide a predetermined excess quantity of water in the tank over the gallonage indicated by the gallonage indicator, and adjustable means for locking said temperature indicating lever and said distance indicating lever together in relative adjusted positions.

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