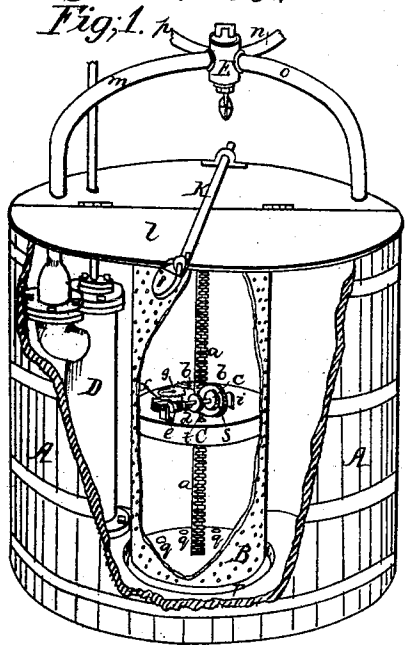
G. W. & M. W. Nesmith & J. Minor,

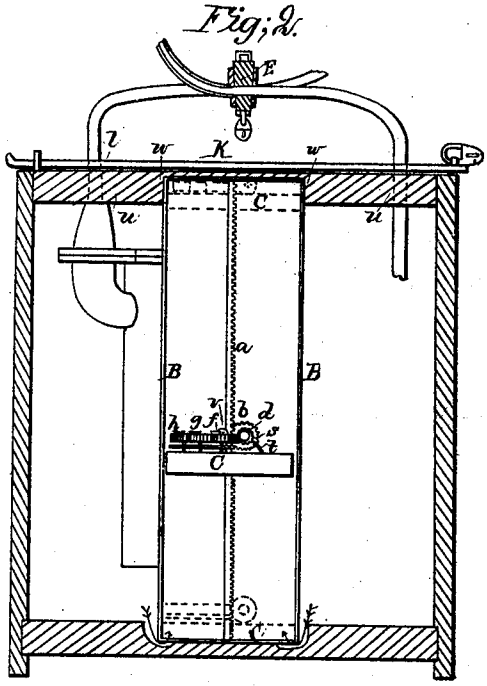
Liquid Meter.

No. 87,959. Patented Mar. 16, 1869.

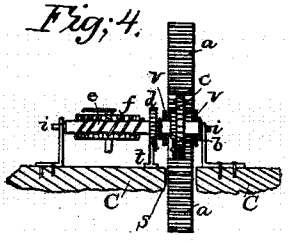
Fig; 1.



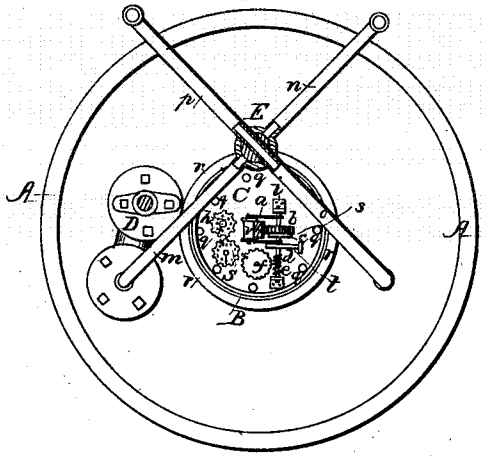
Fig; 2.



Fig; 4.



Fig; 3.



Witnesses;

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United States Patent Office.

JOHN MINOR, OF PEORIA, AND MILTON W. NESMITH AND GEORGE W. NESMITH, OF METAMORA, ILLINOIS.

Letters Patent No. 87,959, *dated March* 16, 1869.

IMPROVEMENT IN LIQUID-METERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, JOHN MINOR, of the city and county of Peoria, and State of Illinois, and MILTON W. NESMITH and GEORGE W. NESMITH, of Metamora, county of Woodford, in said State, have invented a new and useful Apparatus for Measuring and Registering Spirits, Wines, and other Liquids; and do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being made to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view.

Figure 2, a vertical section of the spirit or wine-receiver, or tub, and the enclosed apparatus.

Figure 3, a plan of the same.

Figure 4, a longitudinal elevation of the registering-apparatus.

In the drawings, like figures refer to like parts.

This invention has for its object to furnish an accurate register and measurement of all spirits, high or low-wines, or other liquors, passing into or through any receiver or cistern for such liquors.

The apparatus for this purpose consists of a cylindrical guard, B, placed inside of the receiver A, and extending from top to bottom of the same, either in the centre of latter, or on one side, as may be most convenient.

A sink, or hollow, *r*, is cut in the bottom of the tub A, of about one inch in depth, being of the same diameter as the cylindrical guard B, or a little larger, so as to receive the lower end of the same, and to give admission of the liquor to the perforations *q q q*, &c., in the bottom of the same. The sides of the cylinder may also be perforated, if thought necessary.

Within the cylinder is placed a float, C, of cork, copper, or other suitable material, but of a smaller diameter than the former, so as to freely rise and fall with the surface of the liquor.

Near the centre of the cylindrical guard, and passing through a boxed hole in the centre of the float, is set a vertical toothed bar or rack, *a*, secured to the tub A at top and bottom.

On the float is placed a registering-apparatus, so constructed as to register with accuracy the number of inches in depth to which the tub may be filled. This number being ascertained, it only remains to take the average diameter of the tub to ascertain the cubic inches received in the same during any given period of time.

The register consists of a spur-wheel, *b*, of twenty teeth, (or five cogs to one inch on its circumference,) working on the upright rack, or toothed bar *a*, and kept engaged therewith by a flanged pulley, V, connected with the axle of said wheel *b*, on the opposite side of the bar *a*.

This toothed wheel *b* works loosely on a horizontal shaft, *i*, and moves the index-wheels of the register forward when the float C rises, by means of a pawl, *s*, attached to its side, which engages with a ratchet-wheel, *c*, which is stationary on the shaft *i*, but, on the sinking of the float, merely revolves, without any effect on the register.

The shaft *i* is prevented from making a reverse motion on the sinking of the float and the liquor, by means of a second ratchet-wheel, *d*, on the same shaft, and stationary thereon, and a pawl, *t*, hinged to the float, engaging therewith, and preventing said backward motion.

On this shaft *i* is also a worm or helix, *e*, which engages with a horizontal wheel, *f*, containing twenty-five teeth, (or a similar proportion to the other wheels,) having a dog or pin on its circumference, which, on the revolution of this wheel, strikes or moves forward an adjoining horizontal wheel, *g*, also cogged with ten teeth, which latter wheel has also ten teeth, or cogs, on its circumference, and a similar dog, or pin, which, at every tenth revolution, moves forward still another adjoining cogged, or ratcheted wheel, *h*, and, if necessary, any number of similar wheels.

Each wheel is set on a vertical axle, and each wheel has a pointer, or index-hand, stationary, on a stationary axle, pointing toward the circumference of each of their respective wheels, on which are marked the Arabic numerals, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0; or the index-hands may be attached to their respective wheels, and a stationary index be placed above the wheels, and beneath each hand or index.

The first wheel may register the units, and when ten (0) has been received by the wheel, the dog on its circumference immediately transfers that value, or 10, to the "tens" wheel, *g*, which thereupon exhibits "1," *i. e.*, 10, (as it reckons by "tens.") In like manner, this wheel, by means of the dog, or tooth on its edge, on receiving ten several impulses, transfers the count to the "hundreds" wheel, *h*, and by adding other wheels and indexes thereto, millions of millions may be registered.

The pump-eduction pipe *m* enters a "four-way" cock, E, as does the induction-pipe *p*, and leaves the cock on the opposite side, and passes into the tub A by another arm, *o*, as does also the eduction-pipe *n* leave the cock E by an opposite port, and passes away elsewhere.

By this arrangement, no liquor can be pumped out during the passage in of liquor, which would keep the register inoperative, by retaining the liquor at one height, and with it the float.

The lower end of the key of the cock E is cut with a thread thereon, and terminates in a staple, a nut screwing on to the thread, and a padlock then passed through the staple effectually secures the key.

The cover of the receiver or tub A is recessed above and around the cylindrical guard B, to steady it, and to allow the float to reach the extreme limit of the rise of the liquor in the tub. The cover may be made in

halves, or other divisions, hinged together, and barred and padlocked, and should be covered with a plate or sheet of iron, leaving apertures for the pipes and the pump-rod, if a spirit or low-wine tub.

The operation of this meter is as follows:

The liquor being introduced by connecting the induction-pipe *p* with the branch which enters the tub, by adjusting the key of the four-way cock E, cuts off at the same time the eduction-pipe *m n* from the force-pump D. The float begins to rise from the recess cut in the bottom of the tub A, into which recess, *r*, the lower end of the cylindrical guard B projects, by reason of the free ingress of the liquor through the openings *q q*, &c., into said guard B, at the same time giving motion to the wheel engaged with the vertical toothed rod or rack *a*, thus turning the register-wheels forward, and measuring each inch of vertical ascent passed over by the float C, the pawls *s* and *t* not interfering with the register unless the liquor is drawn or pumped out.

When the float has reached the top of the guard B, the registering-process ceases with the capacity of the tub.

The guard B may be perforated, if thought necessary, for admission of liquor, but the holes should not be large enough to endanger the steady action of the float and register, to protect which latter the guard is expressly designed.

On shutting off the supply-pipe *p o*, and opening the eduction-pipe *m n* from the force-pump D, the lowering of the liquor causes a reverse action of the toothed wheel *b*, engaged in the rack *a*, which turns on its axle without any effect on the register, the pawl *s* allowing it free motion in that direction, and the axle *i* being further retained by the second pawl, *t*, on the wheel *d*, and attached to the float at its fulcrum. In this manner, the register remains stationary while descending; but the moment an accession of liquor occurs, the wheel *b* transfers the amount to the register.

This apparatus may be attached or placed within any receptacle for liquors, &c., and will correctly register the number of inches of liquid received, provided the receiver or receptacle is cylindrical. All that would be necessary to ascertain the quantity passed through such place, would be to multiply the area of the tub by the registered number of linear inches.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A meter for spirits, or other liquids, consisting of a closed tub, A, provided with a recess, *r*, at its bottom, and the recess *w* at its top, for the reception of the perforated guard B, and its contained float, C, arranged and operating substantially as described.

2. The combination and arrangement of the float C and vertical toothed bar *a*, working with the loose pinion *b*, on the horizontal axle *i i*, engaging, by a pawl, *t*, with the fast wheel or ratchet *c*, the ratchet-wheel *d* and pawl *t* on the float, the worm or helix *e*, giving motion to the index-wheels *f g h*, all working together substantially as described, and for the purposes specified.

3. In combination with the above devices, the four-way cock E and connecting-pipes *m n* and *o p*, arranged as described, so that the supply and discharge may be alternate, but not simultaneous.

In testimony that we claim the above, we have hereunto subscribed our names, in the presence of two witnesses.

JOHN MINOR.
MILTON W. NESMITH.
GEORGE W. NESMITH.

Witnesses:
ELIOT CALLENDER,
E. S. WHITTLESEY.