No. 762,575. PATENTED JUNE 14, 1904.

M. BRAY.

INDICATOR FOR LIQUID RECEPTACLES.

APPLICATION FILED OCT. 29, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

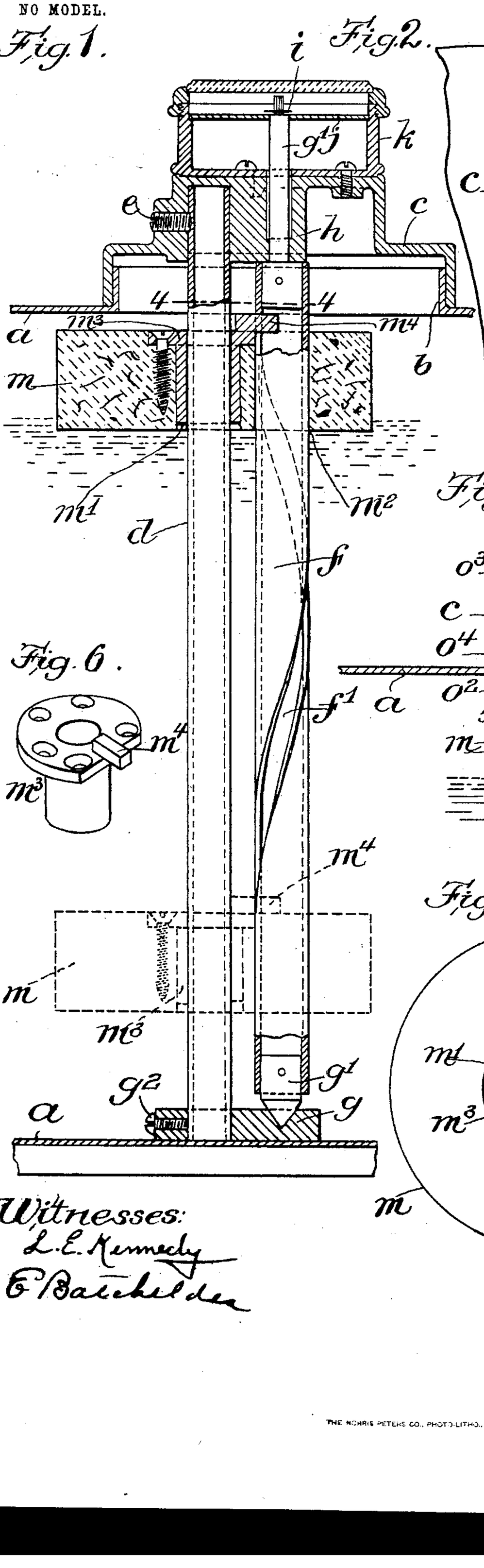

Fig. 2.

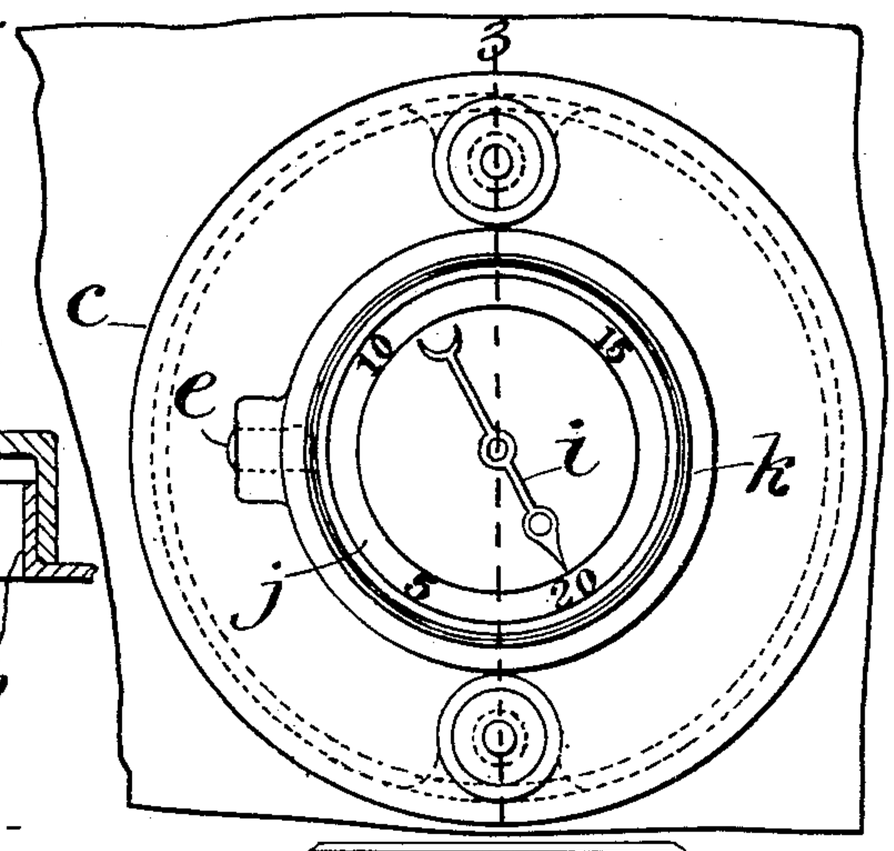

Fig. 3.

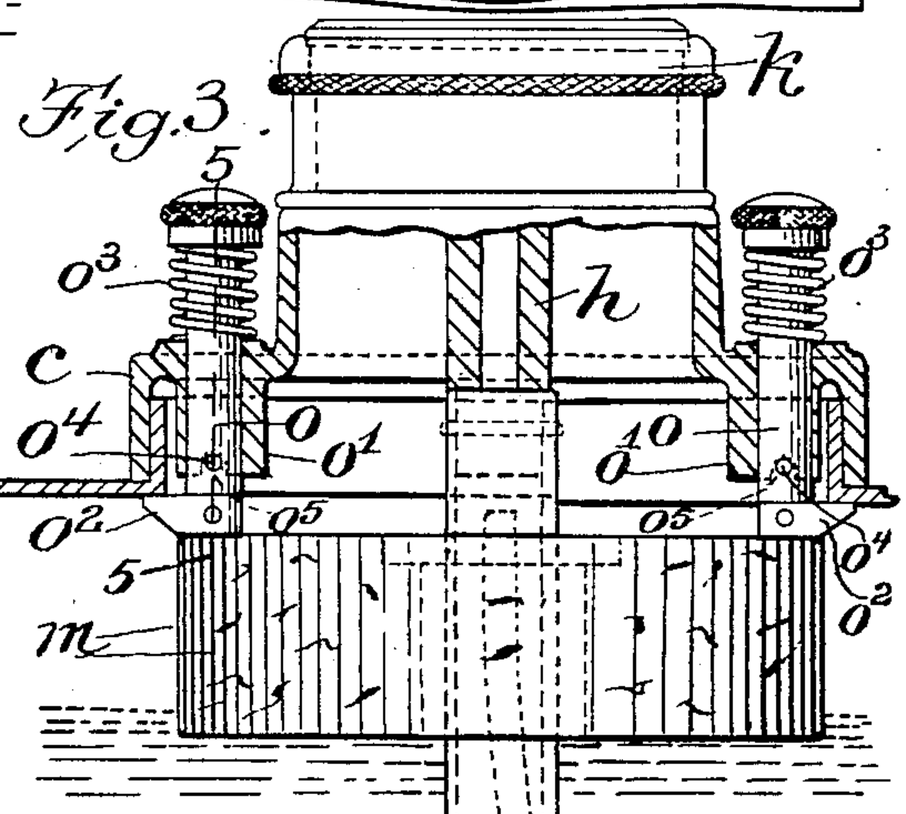

Fig. 4.

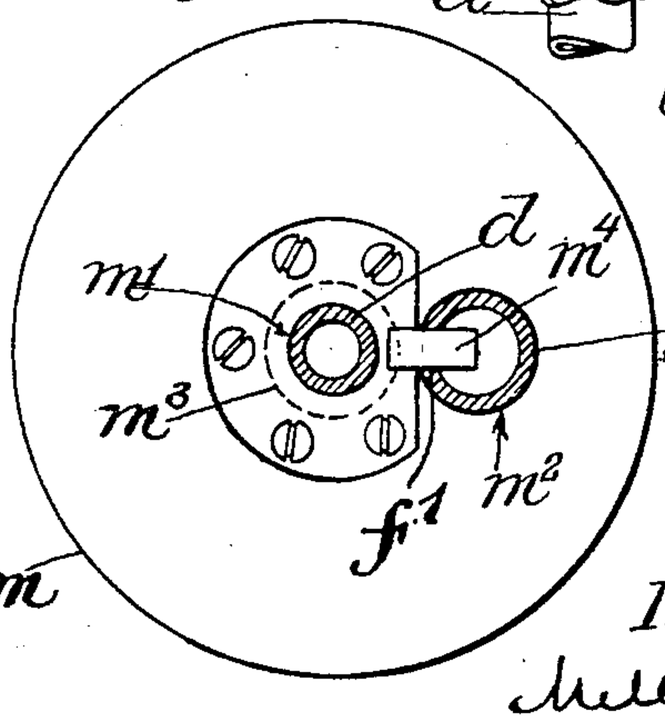

Fig. 5.

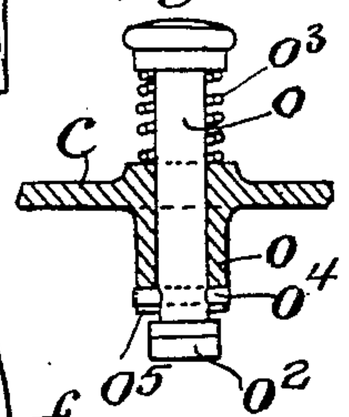

Fig. 6.

Witnesses:
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INDICATOR FOR LIQUID RECEPTACLES.

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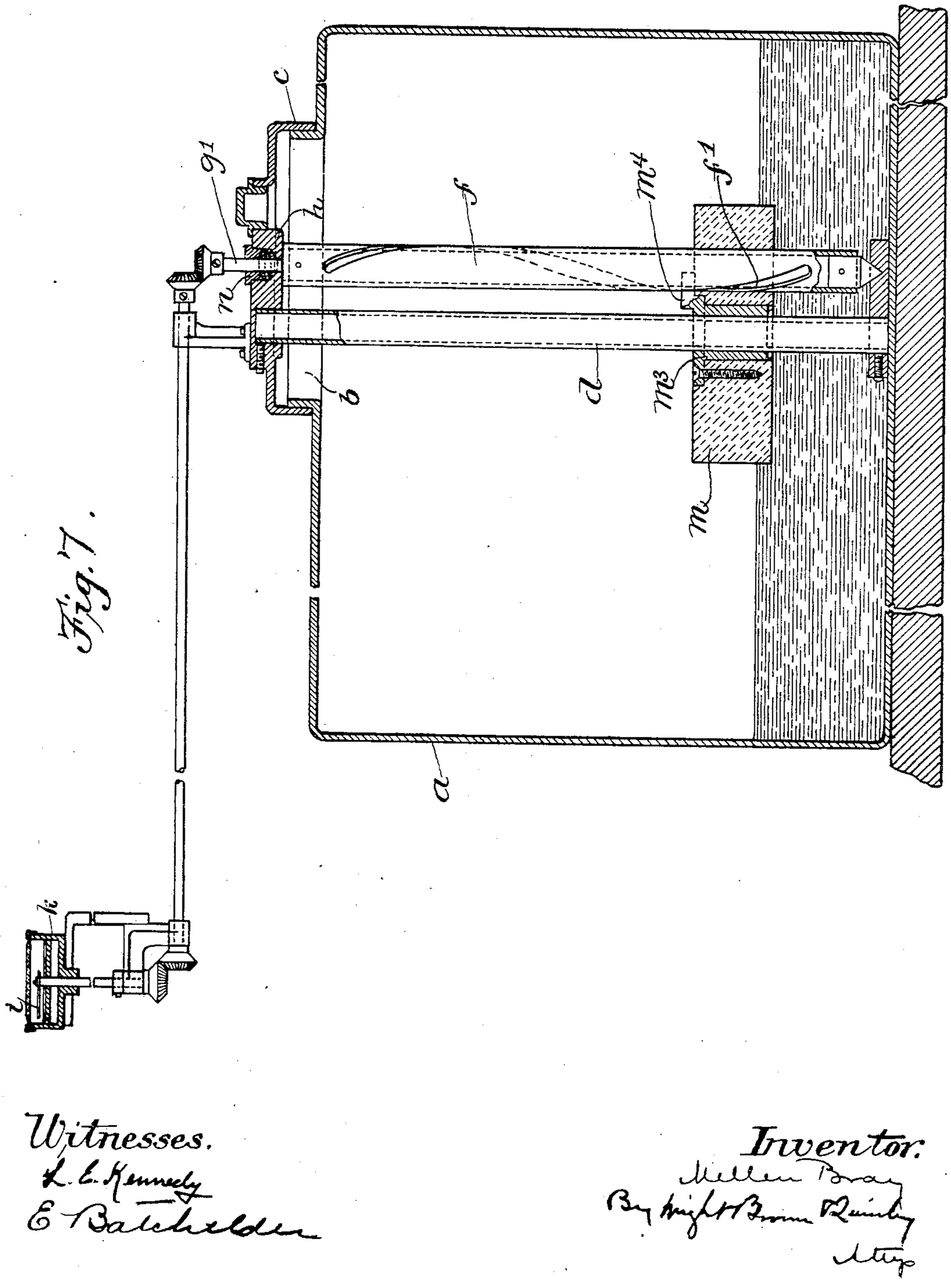
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 7.



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UNITED STATES PATENT OFFICE.

MELLEN BRAY, OF NEWTON, MASSACHUSETTS.

INDICATOR FOR LIQUID-RECEPTACLES.

SPECIFICATION forming part of Letters Patent No. 762,575, dated June 14, 1904.

Application filed October 29, 1903. Serial No. 179,046. (No model.)

To all whom it may concern:

Be it known that I, MELLEN BRAY, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Indicators for Liquid-Receptacles, of which the following is a specification.

This invention has for its object to provide a simple and efficient apparatus for indicating the height or quality of liquid in a receptacle by a pointer or indicating member outside the receptacle.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation, partially in section, showing an indicator embodying my invention. Fig. 2 represents a top view of the same. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents a section on line 5 5 of Fig. 3. Fig. 6 represents a perspective view of the bushing affixed to the float. Fig. 7 represents a view similar to Fig. 1, showing the pointer located at a distance from the reservoir.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents the tank or reservoir, which in this case may be assumed to be the gasolene-reservoir of a motor-vehicle, said reservoir having in its top a flanged opening *b*, through which liquid may be inserted into the reservoir.

c represents a cap which is formed to surround the opening *b*.

d represents a vertical guide, which is preferably tubular and is affixed by a set-screw *e* to the cap *c*, said guide extending downwardly into the tank, and preferably to the bottom thereof.

f represents a vertical shaft, which is located beside the guide *d* and is substantially parallel therewith. The lower end of the shaft is journaled in a step *g*, affixed to the lower end of the guide *d*. The upper end of the shaft is journaled in a sleeve or bearing *h*, formed on or affixed to the cap *c*. The main portion of the shaft *f* is preferably tubular, its end portions having solid terminals *g' g'*. In Fig. 1 I have shown a pointer *i* affixed to the upper terminal *g'*, said pointer projecting over a graduated plate *j*, with which it coöperates, as hereinafter described. The plate *j* and pointer *i* are inclosed in a case *k*, which surmounts and is affixed to the cap *c*.

m represents a float, of cork or other suitably-buoyant material. Said float is provided with two orifices *m' m²*, the orifice *m'* surrounding the guide *d*, while the orifice *m²* surrounds the shaft *f*. The said orifices are of such diameter that they are adapted to slide freely on the guide and shaft, so that the float is free to rise and fall with the liquid in the tank. The orifice *m'* is provided with a bushing *m³*, on which is formed a stud or finger *m⁴*, which projects over the orifice *m²* and enters a spiral slot *f'*, formed in the body portion of the shaft *f*. It will be seen that the float *m*, while free to slide vertically on the guide *d* and shaft *f*, is prevented from rotating on the guide by the shaft, so that a vertical movement of the float will cause the stud *m⁴* to coöperate with the spiral slot *f'* in imparting a rotary motion to the shaft *f*. The spiral slot *j* is so formed that the float in moving from one extreme of its travel to the other will impart a complete rotation to the shaft, thus causing the pointer *i* to travel completely around the dial *j*.

I am aware that it has been proposed heretofore to rotate a pointer-carrying shaft by means of a float movable upon a fixed guide and engaging a spiral member on the shaft. So far as I am aware, however, the practice heretofore has been to locate the shaft within the guide, the latter being tubular and provided with a longitudinal slot through which a stud or pin on the float passes to engage a spiral member on the shaft within the guide.

My invention is distinguished from that last referred to by the fact that the guide and shaft are located side by side and are independent of each other, the shaft being external to the guide. I am therefore enabled to make the shaft of any desired diameter instead of being obliged to limit its diameter so that it may enter the guide. I am also enabled to make the guide of much less diameter than would be possible if the shaft were located within it. A pointer-operating shaft of a relatively large diameter is desirable on account of the increased leverage which the pin on the float exerts on the shaft when the diameter is relatively large, as compared with the leverage exerted on a shaft of smaller diameter. Hence the float is enabled to act more effectively in overcoming the frictional resistance to the rotation of the shaft. This resistance is especially to be considered when the shaft is extended through a stuffing-box *n* in the top of the tank, as shown in Fig. 7, which figure shows a pointer *i*, located at a point remote from the tank and connected with the shaft *f* through suitable gearing and shafting. It will be seen that the stuffing-box, which is desirable to prevent leakage of liquid around the shaft *f* where it passes through the top of the tank, adds materially to the frictional resistance which the shaft has to overcome. The advantage of locating the shaft outside the guide *d*, so that it may be made of any desired diameter, will therefore be apparent.

The cap *c* is secured in place by means of rods *o*, fitted to slide in guides *o'* on the cap and provided with ears or lugs o^2, formed to engage the under side of the top of the tank, as shown in Fig. 3, said lugs being pressed upwardly against the top of the tank by springs o^3. The rods *o* are provided with studs o^4, which are held by the springs o^3 in engagement with notches o^5 in the lower ends of the guides *o'* to prevent the rods from being turned to disengage the ears o^2 from the top of the tank. When it is desired to remove the cap *c*, the rods *o* are depressed until the studs o^4 leave the notches o^5. The rods may then be turned to swing the ears o^2 inwardly out of engagement with the top of the tank, whereupon the cap may be removed. In the embodiment of my invention shown in Fig. 1 the cap *c* supports all parts of the indicator, the guide *d* being affixed to the cap, while the step *g* is affixed to the guide by a screw g^2. The step and the bearing *h* on the cap support the shaft *f*. The indicator is therefore adapted to be applied to and removed from the tank as a whole.

The construction shown in Fig. 7 is intended particularly for motor-vehicles in which the fuel-tank is so located that its top cannot be conveniently seen by the operator, the pointer *i'* (shown in Fig. 8) being offset or removed from the tank into a convenient location to be viewed from the operator's station.

I claim—

1. In combination, a liquid-receptacle, a fixed vertical guide therein, a vertical rotary shaft located beside the guide and exterior thereto and provided with a spiral slot, a pointer operated by the rotation of said shaft, and a float having two orifices, one of which is substantially central and is provided with a bushing having a stud projecting partially across the second orifice, the said bushing slidably fitting the fixed guide and the stud engaging the slot in the shaft, so that a vertical movement of the float causes a rotary movement of the shaft, the float being prevented from rotating by the shaft.

2. The combination with a liquid-receptacle having an opening in its top, of a cap formed to cover said opening, a vertical guide affixed to the cap and projecting downwardly therefrom, a step affixed to the lower portion of the guide, a pointer-operating shaft journaled at its lower end in said step and at its upper portion in the cap, said shaft having a spiral slot, a float having two orifices one of which is substantially central and is provided with a bushing having a stud projecting partially across the second orifice, the said bushing slidably fitting the fixed guide and the stud engaged with the said spiral slot, and means for securing the cap to the receptacle.

3. The combination with a liquid-receptacle having an opening in its top, of a cap formed to cover said opening and provided with indicator-operating mechanism including a float, and a shaft rotated by a vertical movement of the float, and cap-locking means comprising rods longitudinally movable and rotatable in the cap and provided with ears to engage the cap, springs arranged to press the rods outwardly, and interlocking members which cooperate with the springs in preventing rotation of the rods.

4. In combination, a liquid-receptacle, a rotary vertical shaft within the said receptacle and extending through a wall of the receptacle and supported independently of the shaft, a revoluble pointer adjacent to the receptacle, connections between the shaft and pointer for imparting rotary motion from one to the other, a float within the receptacle, means for guiding the float vertically, and means for imparting rotary movement from the float to the shaft.

5. In combination, a liquid-receptacle, a fixed vertical guide therein, a vertical rotary shaft located beside the fixed guide and provided with a spiral slot, a revoluble pointer adjacent to the receptacle, and supported independently of the shaft, connections between the shaft and pointer for imparting rotary motion from

the former to the latter, and a float having two orifices, one of which is substantially central and is provided with a bushing having a stud projecting partially across the second orifice, the said bushing slidably fitting the fixed guide and the stud engaging the slot in the shaft, so that a vertical movement of the float causes a rotary movement of the shaft, the float being prevented from rotating by the shaft.

In testimony whereof I have affixed my signature in presence of two witnesses.

MELLEN BRAY.

Witnesses:
FRED A. POPE,
M. E. CROCKER.