No. 794,675. PATENTED JULY 11, 1905.

M. MARTIN.

FLUID GAGE.

APPLICATION FILED NOV. 18, 1904.

Fig. 1.

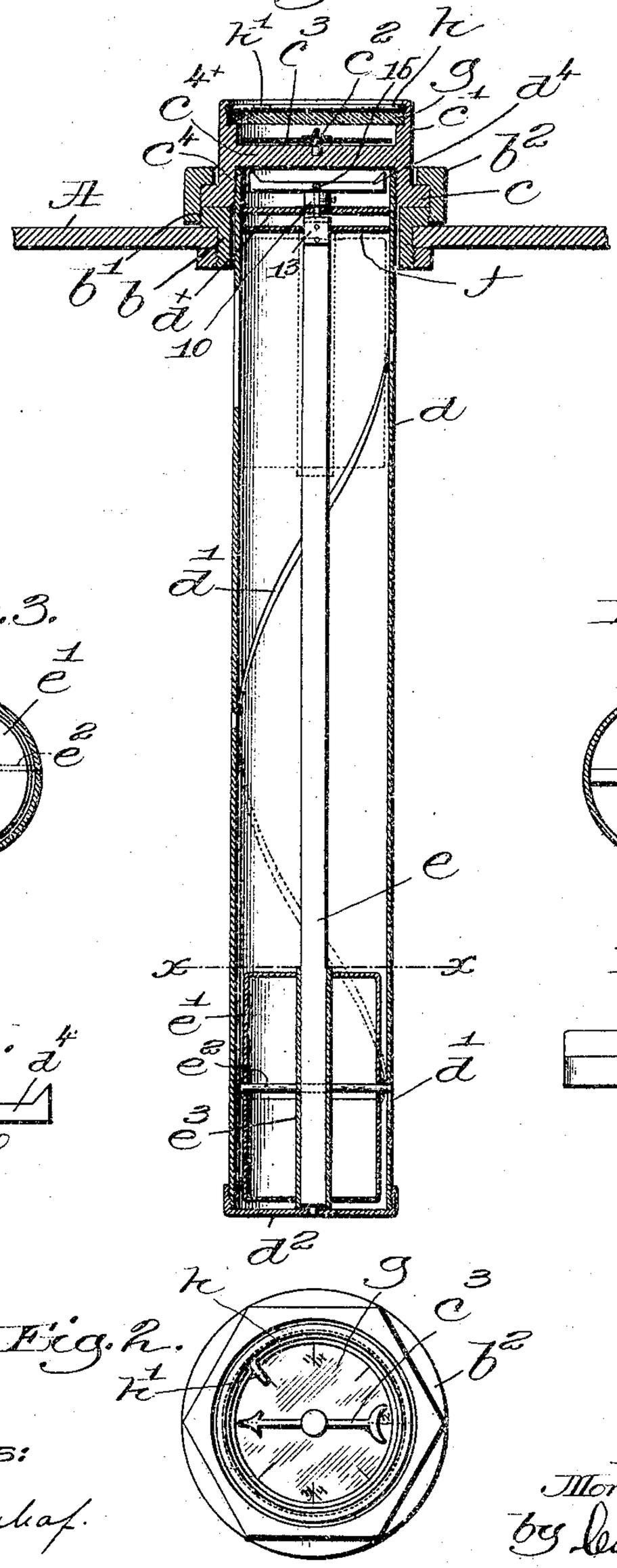

Fig. 3.

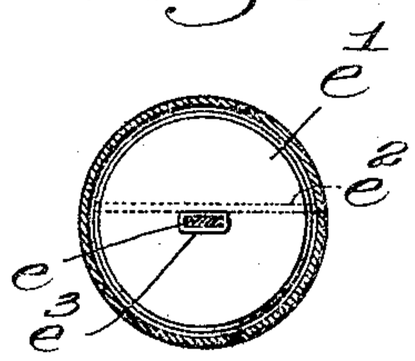

Fig. 4.

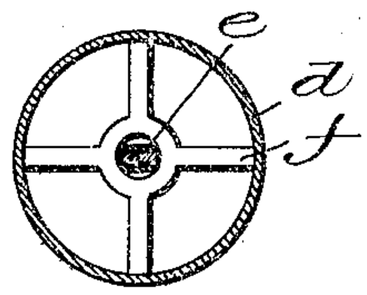

Fig. 5.

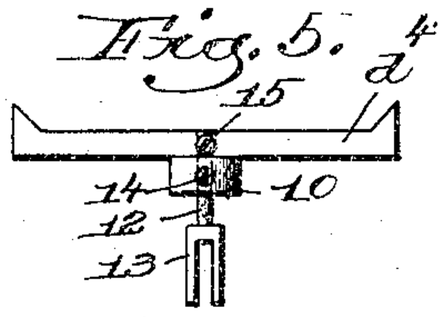

Fig. 6.

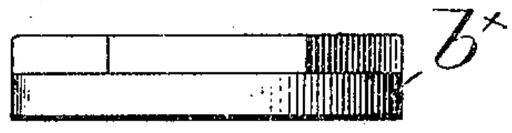

Fig. 2.

Witnesses:
Fred. S. Grunbaf.
S. Wm. Sutton.

Inventor.
Morris Martin,
by Busby Gregory.
Attys.

No. 794,675. Patented July 11, 1905.

UNITED STATES PATENT OFFICE.

MORRIS MARTIN, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO GEORGE W. GREGORY, TRUSTEE, OF BOSTON, MASSACHUSETTS.

FLUID-GAGE.

SPECIFICATION forming part of Letters Patent No. 794,675, dated July 11, 1905.

Application filed November 18, 1904. Serial No. 233,329.

To all whom it may concern:

Be it known that I, MORRIS MARTIN, a citizen of the United States, and a resident of Malden, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Fluid-Gages, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention, relating to fluid-gages, has for its object to simplify the construction of the same and produce a gage capable of quick application to a tank containing gasolene, oil, water, or other fluid the quantity of which in the tank it is desirable to be able to readily determine.

Figure 1 in section shows part of a tank or vessel to contain the fluid the quantity of which it is desired to determine. Fig. 2 is a top or plan view of the gage. Fig. 3 is a section on line x, taken through the float, showing the pin connected therewith that travels in the slot of the float-guiding means. Fig. 4 is a section of the tube and shaft below the magnet to show the stop. Fig. 5 shows the collar detached, and Fig. 6 shows the cap which may be used to close the opening in the curb leading into the tank when the gage is not to be used.

In the drawings, A represents part of a tank or vessel to contain the gasolene or other fluid the quantity of which is to be determined. The tank has an open-centered curb or bushing b secured thereto gas and fluid tight, said curb being threaded at b' to be engaged by a ring-nut b^2 (shown as having an inturned flange) to overlap a flange c of a head or compass-box c', having a pivot c^2, on which is mounted a magnetic needle c^3.

The compass-box at its lower end is shown as threaded, as at c^4, to receive the upper end of a casing (shown as a tube d) provided with a float-guideway (shown as a spiral slot d') in the tube. The lower end of this tube has a step d^2 for guiding the lower end of a rock-shaft e, made as a thin steel ribbon flattened at two sides. (See Fig. 3.) The upper end of the shaft enters a fork 13, provided with a journal or extension 12, that is extended upwardly through a hole in the plate $d^\times$, and the extension has fitted to it a collar 10, adjustably sustained thereon by a set-screw 14. The upper end of the extension receives and sustains a permanent magnet, the latter being adjustably secured thereto by a set-screw 15, the magnet in its rotation through the rising and falling of the float, to be described, being revolved close to the under side of the division-wall $c^{4\times}$ of the compass-box.

The magnetic needle and the magnet are physically unconnected one with the other; but the magnetic force of the magnet acting upon the needle turns the needle in unison therewith, so that the magnet holds the magnetic needle in alinement with it and shows the position of the magnet, which is concealed in the head and which is revolved by the rise and fall of fluid in the tank.

By securing the magnet to the extension adjustably by the screw, as stated, the magnet may be adjusted as required on or with relation to the shaft to adapt the needle to coact properly with the float when the latter, for instance, occupies its position at the bottom of the tube. The collar and plate $d^\times$ sustain the weight of the shaft and magnet and obviate wearing away of the step d^2.

The ribbon-shaft e is surrounded by a float e', comprising a two-part shell of very thin metal, preferably about .002 of an inch in thickness, and a flattened tube e^3, the tube and shell being soldered together air and fluid tight, so that said float has great buoyancy, as is necessary in connection with gasolene, which is so much lighter than water.

The compass-box is placed in adjusted position on the curb and is there clamped where it belongs by the ring-nut b^2. The compass-box with its attached tube and float may be removed, if necessary, from the curb and taken out of the tank by first running off the clamping-nut. The curb may be closed tight at any time—as, for instance, if a manufacturer of automobile-tanks does not wish to furnish a gage with the tank he may close the curb b by means of a cap $b^\times$. (Shown detached in Fig. 6.)

The float has an extended pin e^2, and inas-

much as the metal comprising the float is so very thin I find it of advantage to use a long pin and extend the same through the shell of the float, the pin crossing one of the sides of the flattened tubes, (see Fig. 3,) one end of the tube projecting far enough to enter the slot d' in the tube.

I have provided the tube with a stop f, so located with relation to the upper end of the spiral slot d' as to arrest the float in its rising movement just as or before the pin e^2 of the float meets the upper end of the slot.

In case the tank with which the described gage is to be used is to present an air-space above the level of the fluid therein to contain compressed air, it is necessary to have some provision to guide the person filling the tank, that an undue quantity of gasolene may not be put into the tank by careless filling, for an excess of gasolene is detrimental to the proper working of the automobile.

To provide means whereby the party filling the tank may know when the tank has been filled to the desired point, which for the sake of illustration herein I have selected as between full and three-fourths full, I have added to the gage above the glass g an adjustable indicator h, having a finger h', which may be changed in its position so that the finger may be located at just the point where the magnetic needle should be stopped when the proper amount of gasolene has been put into the tank. By the use of this gage a person filling the tank may know just when to stop filling, and if the tank is filled with as much gasolene as will raise the float and move the magnetic needle beyond the position occupied by the finger of the indicator then the owner of the automobile should not pay for the extra amount of gasolene, which is really detrimental to the proper running of his machine. Further, if the filling-point is once established and a person after a ride brings his automobile in and it indicates through the magnetic needle that the tank is one-fourth full the owner may merely make a note of the position of the needle when the automobile was brought in, and he cannot be charged for more gasolene than to move the needle from the one-fourth to the established filling-point.

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

1. In a fluid-gage, a tank, a curb sustained thereby, a compass-box having a pivot, a magnetic needle mounted thereon, a float-guide depending below said compass-box, a rock-shaft having a magnet secured to its upper end, a float controlled by said float-guide to turn said shaft, and a ring-nut to clamp the compass-box on said curb in any position in which it may be set when correctly adjusting said compass-box and magnet on said curb.

2. In a gage of the class described, a spirally-slotted guide-tube, a rock-shaft sustained therein, a thin sheet-metal float located inside of said guide-tube, said sheet-metal float comprising a two-part hollow shell, and a central tube, said float having a pin extended therethrough and entering the slot of the guide-tube.

3. In a gage of the class described, a slotted guide-tube, a rock-shaft sustained therein, a hollow shell having a central tube embracing loosely said rock-shaft, said shell having a pin extended through a part of said shell and crossing one side of said tube, the end of the pin entering the slot in the guide-tube.

4. In a fluid-gage, a tube provided with a plate in the upper portion thereof, a compass-box having a magnetic needle and disposed above said plate, a shaft sustained in said tube, a permanent magnet mounted at the upper end of said shaft between the plate and the compass-box, and a float guided and turned by said tube in the rising and falling movement of the float due to changes in the fluid-level.

5. In a fluid-gage, a head chambered at its upper end, a tube connected with the lower end of said head and extended downward therefrom, a shaft sustained in said tube, a magnet connected with said shaft, a magnetic needle pivoted in the chamber at the upper side of said head, and a float contained within said tube and embracing said shaft, the float connected with said shaft turning the same and its magnet in one or the other direction as the float rises and falls and is turned within said tube due to change of level of fluid sustaining said float, the magnet turning in unison with it the magnetic needle, substantially as described.

6. In a fluid-gage, a head chambered at its upper end and having a recess in its under side, a tube connected to the under side of said head, a shaft sustained in said tube, a permanent magnet revoluble in said recess in the under side of the head and connected to said shaft, a plate in said tube below the permanent magnet, a magnetic needle or member physically unconnected with said magnet and mounted in the chamber at the upper side of said head, a float mounted to rise and fall in said tube and having a connection with said shaft therein sustained to rotate the latter and consequently the permanent magnet as the float rises and falls due to variations in fluid-level.

7. In a fluid-gage, the combination with an open-centered curb or bushing adapted to be applied to a tank, of a head to close the opening in said bushing fluid-tight, a tubular casing connected with the under side of said head, a movable permanent magnet revoluble in said head, a float connected with said magnet to revolve the same, a magnetic member or needle physically unconnected with said magnet and mounted at the upper side of said head, said magnet being revolved by the float due to variation of level of the fluid with which it

coöperates, and causing the magnetic member or needle exposed at the outside of said head to take positions corresponding with the positions of the magnet, the magnetic member or needle indicating by its position variations of level of the fluid in the tank.

8. In a fluid-gage, the combination with a bushing having an opening leading into a fluid-holding tank, of a chambered head to close said opening fluid-tight, a tubular casing adapted to be introduced through the opening in said bushing into the tank, means connecting the tubular casing to the under side of the head when the tubular casing is in the tank, a shaft inside said casing provided at its upper end with a magnet, a float within said casing and surrounding said shaft to turn the same and its connected magnet, a magnetic needle pivoted at the upper side of said head and physically unconnected with said magnet, the rotation of the magnet causing the needle to take positions in alinement with said magnet to thereby indicate variations in the level of fluid in said tank.

9. In a fluid-gage, the combination with the bushing of a fluid-tank provided with a circular opening, of a head to close said opening, means for clamping the head upon the bushing a magnetic portion mounted at the outer side of said head, a tubular casing attached to the under side of said head and adapted to be inserted through said filling-opening, a second magnetic portion physically unconnected with said first magnetic portion and pivoted at the upper end of said casing below said outside magnetic portion, a float within the casing and connected with said second magnetic portion to rotate the same and cause said outside magnetic portion to take positions corresponding with said second magnetic portion and thereby indicate variations in the fluid in said tank.

10. In a fluid-gage, a bushing adapted to be attached to a tank, a head to serve as a closure for the opening in the bushing, a connected slotted tube provided at its upper end with a bearing, a shaft, a magnet connected with the upper end of said shaft above said bearing, a hollow impervious float sealed against the admission of fluid and located wholly inside said tube, said float being provided with a pin extending therethrough and entering said slot, said shaft, slotted tube and float being constructed in a manner to rotate said shaft and its magnet, combined with a pivoted magnetic needle exposed at the upper side of said head and rotated in unison with said magnet by the attractive force of the latter, as and for the purpose described.

11. In a fluid-gage, a horizontally-revoluble exposed magnetic needle, means to sustain the same, a tube, a shaft sustained in said tube and provided at one end with a permanent magnet physically unconnected with said needle, and a float contained wholly inside said tube and connected with said shaft in a manner to rotate the magnet in a horizontal plane and cause the exposed magnetic needle to take positions corresponding to said magnet and a plate disposed in said tube below the magnet for the purpose described.

12. In a fluid-gage of the class described, a thin sheet-metal hollow float having an externally-projecting guiding-pin, a tube having a spiral guideway, a shaft sustained therein and provided along its upper end with a magnet, a plate sustained within said tube below the magnet and a pivoted magnetic needle thereabove controlled as to its movement by the movement of the magnet, said pin entering the guideway of the tube, the float as it rises and falls turning the shaft carrying the magnet and with it the magnetic needle.

13. In a gage of the class described, a chambered head, a slotted tube to enter a tank, said slotted tube being connected to the under side of the chambered head a vertical shaft sustained within said tube, a permanent magnet connected with and rotated by said shaft, a hollow sheet-metal float within said tube and engaging said shaft, a pin extended from said float entering the slot of said tube in a manner to turn said shaft and magnet as the float, sustained by the liquid in said tank, rises and falls within said tube, and a pivoted magnetic needle within the chambered head and wholly disconnected from said magnet and rotated wholly by the magnetic influence of the magnet.

14. A fluid-gage comprising a tube provided with a plate in the upper portion thereof, a magnet located within the end of said tube, a compass-box connected with the upper end of said tube and sustaining a magnetic needle unconnected with said magnet, and a float connected to said magnet to revolve the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MORRIS MARTIN.

Witnesses:
GEO. W. GREGORY,
LOUIS C. SMITH.