J. D. WALSH.

METER.

905,254. APPLICATION FILED MAY 15, 1906.

Patented Dec. 1, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

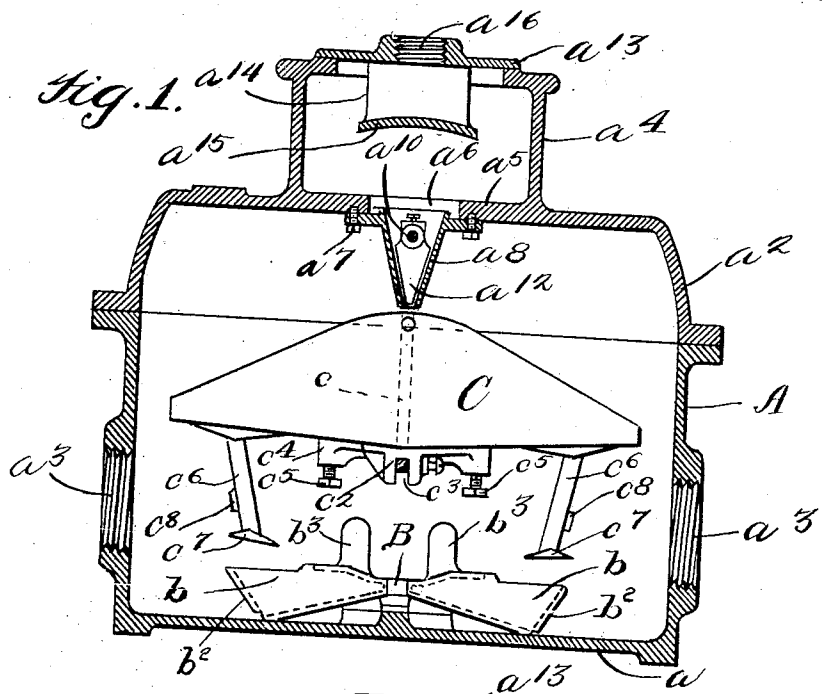

Fig. 2.

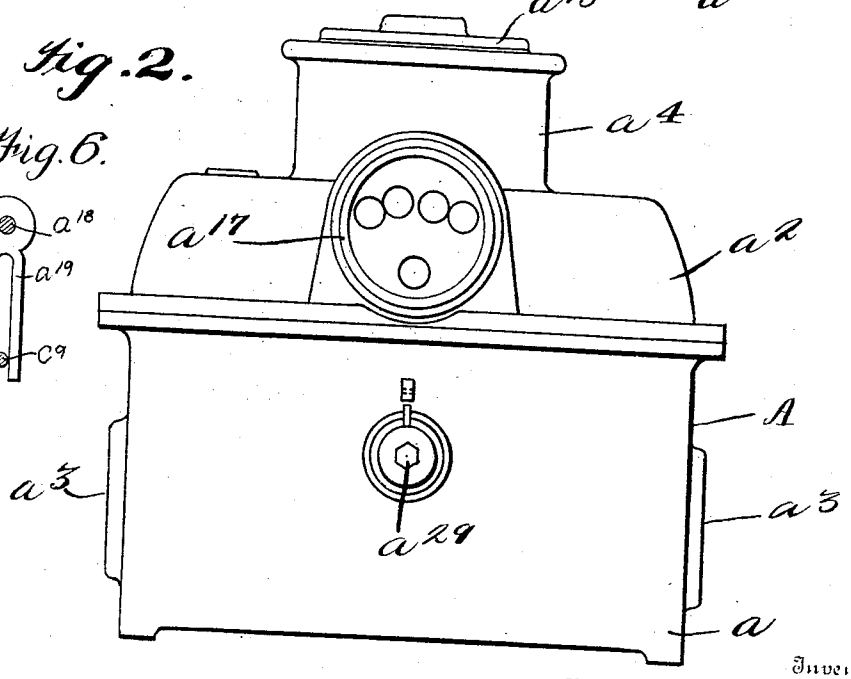

Fig. 6.

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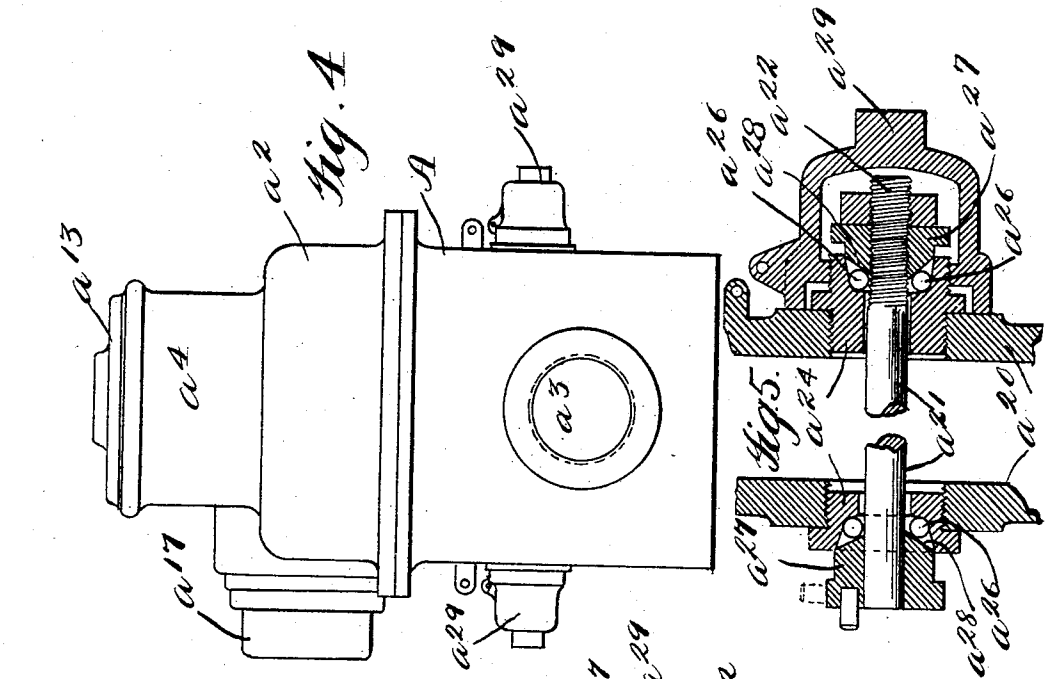
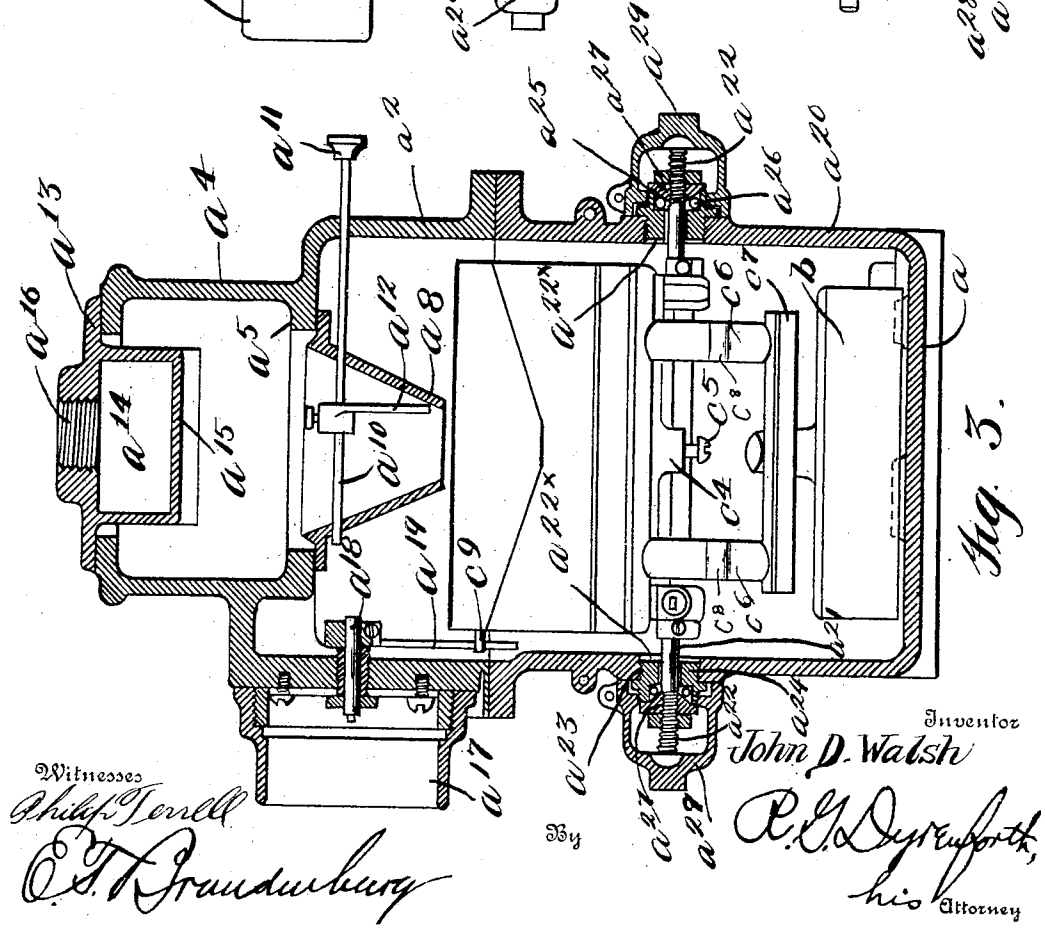
2 SHEETS—SHEET 2.





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UNITED STATES PATENT OFFICE.

JOHN DANIEL WALSH, OF LOCKPORT, NEW YORK, ASSIGNOR TO AMERICAN DISTRICT STEAM COMPANY, OF LOCKPORT, NEW YORK, A CORPORATION OF NEW YORK.

METER.

No. 905,254. Specification of Letters Patent. Patented Dec. 1, 1908.

Application filed May 15, 1906. Serial No. 317,030.

To all whom it may concern:

Be it known that I, JOHN DANIEL WALSH, a citizen of the United States, residing at Lockport, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Meters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The broad and general object of my invention is to provide an efficient, accurate, and wear-resisting device for measuring and metering liquids, which shall be noiseless in operation, simple in construction, and free from jar in use, and which may be readily adjusted to meter the same and varying quantities of liquid matter at the same time, and varying quantities at different times.

More specifically, the object of my invention is to improve the structure forming the subject-matter of my Patent No. 796,883, and particularly to simplify the internal arrangement and construction of the patented structure, in the following particulars, among others:

1. Instead of making the dash-pots part of the casting holding the bucket, as in the device of my patent, I now preferably arrange the dash-pots independently of the casting, and removably secure them to the floor of the casing of the meter in any suitable manner; all for purposes presently appearing.

2. In the device of my present application, the shaft or rocker-arm on which the tilting bucket is mounted passes through the front and rear sides of the casing, the ends being supported by and working on ball-bearings disposed on the outside of the meter-casing, thus conducing to free, noiseless, and perfect operation or movement of the bucket, in use. The feature of having the ball-bearings disposed on the outside of the meter-casing is important, as in this position or disposition water cannot possibly get to them.

3. In the use of my patented structure, some difficulty was experienced, owing to the peculiar and particular arrangement thereon of the registering mechanism, in water getting into such registering mechanism and injuring the same. It is, therefore, an important object of my present invention so to arrange the registering mechanism with relation to the other parts of my device that this difficulty will be entirely obviated, and I do this by mounting the registering mechanism outside of and near the top of the casing, and actuated by interposed mechanism in engagement with means desirably secured to or carried by the top part of the bucket.

4. I improve upon the inlet-nozzle or funnel of my patented structure, by reducing the size of the exit end thereof, and this, taken in connection with a reduced-size inlet-opening to the casing and an enlarged outlet-opening or openings, prevents flooding or undue banking up of the water in the casing, which occurred with the device of my patent. And, as a matter of still further and specific improvement, relative to the inlet-nozzle, I provide the same with a peculiar arrangement of cleaning device, operated from the outside of the casing, and very efficacious for the purpose designed.

5. In the device of my present application, I provide a hood or deflector-device disposed above the inlet-nozzle, to prevent flow of water directly into the nozzle, thus tending to prolong the life of the latter.

With these objects in view, and others appearing as the specification proceeds, my invention comprehends the novel construction, combination, and arrangement of parts of a device characterized by my invention, as will be hereinafter fully described in the specification, summed up in the claims, and illustrated in the drawings, in which latter:

Figure 1 is a central, vertical, longitudinal section through the casing of my meter, showing in elevation the interior parts of the device; Fig. 2 is a front elevation of the casing of the meter; Fig. 3 is a vertical transverse section taken centrally through Fig. 1. Fig. 4 is a side elevation of the casing of the meter; Fig. 5 is an enlarged detail view of certain parts of the device. Fig. 6 is a detailed view showing the two-armed yoke.

Referring to the drawings, A indicates the casing of the meter, desirably constructed in two sections, a body portion proper, a, and a removable top section or cover portion a^2; the former being provided with discharge-openings a^3, preferably threaded for connection with piping (not shown), and the latter being provided with a hollow top or upward-extending nose or chimney a^4, open at its

upper end, and with an internal flange a^5, constituting the bottom of the nose a^4, and having a central opening a^6 therethrough. Removably secured, as by screws a^7, to the flange a^5, around the central opening thereof, is an inlet-nozzle or funnel a^8 constructed desirably tapering from the top to the bottom thereof, or wedge-shaped in cross section. Extending through the two end sides a^9 of the funnel, and also through one side of the top section a^2 of the meter-casing, is a rod a^{10}, adapted for reciprocatory movement, and provided, preferably, at its outer end with a handle or knob a^{11}. Carried by the rod, and disposed within the funnel a^8, is a depending scraper a^{12}, desirably shaped, in front elevation, in conformity to the conformation of the funnel a^8 in cross section, that is, wedge or spear shaped, as clearly shown in Fig. 1. Reciprocation of the rod a^{10} will cause the scraper a^8 to move back and forth the length of the funnel, removing any accumulation or deposit of sediment, dirt, mud, and the like, and keeping the exit end of the funnel free for passage of water therethrough. This scraper-device is advantageous, as the exit end of the funnel is quite small and, with the use of muddy water, silt and sediment soon collects and clogs the said exit-end; necessitating, in a short time, removal of the funnel for cleansing, if no scraper were provided.

On top of the upper, open end of the nose or chimney a^4 is arranged a removable cover-plate a^{13}, carrying on its under surface a depending hood or deflector a^{14}, having open sides, and a bowed or curved bottom a^{15} to shed the water quickly; the function of this hood being to break, check, or retard the direct impact of water to, on, and through the funnel a^8, causing the water first to fall on the flange a^5 which thus receives the direct shock or impact of the water, the water thence running into and through the funnel a^8. Strain, jar, and shock are thus materially taken away from the funnel, prolonging its life. The cover-plate a^{13} is provided with an opening a^{16} in line with and emptying into the hood a^{14} and being of considerably smaller size than the outlet-openings a^3, and also preferably threaded for engagement with piping, or the like (not shown).

Secured to the outside of the meter-casing, and preferably to the top section a^2 thereof, so as to be high above the water-level of the liquid within the meter-casing, and thus prevent water getting into it, is a box or housing a^{17} containing any well-known or desired form of registering mechanism. Extending through the said top section a^2 is a pin a^{18}, which directly actuates the registering mechanism, as usual, and fast on the inner end of this pin is a depending two-armed yoke a^{19}, rocked or operated in the manner presently appearing.

Extending through the two end walls a^{20}, and considerably above the bottom, of the casing a, is a shaft a^{21}, the ends thereof being threaded, as shown at a^{22}. The end walls a^{20} are provided with openings a^{22x}, which are threaded, as shown at a^{23}. Engaging these threads are shaft-supporting bushings a^{24}, through which the shaft a^{21} projects, being loosely journaled therein. The bushings are formed cup-shaped at their outer ends, as shown at a^{25}, forming a raceway for anti-friction balls or rollers a^{26} disposed therein. Secured on each threaded end of the shaft a^{21} is a ball-retaining cap a^{27}, provided with a beveled inner surface a^{28} bearing against, and forming the other side of the raceway for, the balls a^{26}. The outer surface of the cup-shaped portion a^{25} is threaded and secured on these threads is a hollow cap a^{29}, preventing dust and dirt getting into the parts of the device inclosed by the cap. It will be seen, therefore, that the shaft a^{21}, on which is mounted the rocking or tilting bucket (as presently described) runs or works on ball-bearings, thus insuring the maximum of ease of operation and a minimum of friction.

Disposed within the casing and removably secured, in any suitable manner, to the bottom thereof is a casting B, desirably formed integral with dash-pot chambers b, b, which are preferably of the contour shown, that is, with flaring sides b^2, for a purpose presently appearing. Preferably formed integral with the top of the casting B are upward-extending bumpers b^3, for a purpose presently appearing.

A tilting bucket C, divided into compartments by a partition c, may be secured to a saddle-bracket c^2 having a central transverse slot or groove c^3 embracing the shaft a^{21}, the saddle bracket being secured to the shaft in any suitable manner, whereby the bucket C is supported on and moves with the shaft a^{21}. Projecting downward from the under surface of the saddle-bracket are bosses c^4, into which are tapped screws c^5 arranged to come into contact alternately with the bumpers b^3, when the bucket is rocked. The bucket C carries on its under surface plungers c^6, a pair thereof being preferably provided on each end of the bucket, as shown clearly in Fig. 3, and each pair may be united, at its lower ends, by a splasher-bar c^7, also clearly shown in Fig. 3, which splasher-bars are arranged alternately to strike the water in the dash-pot chambers b as the bucket is rocked, thus providing an effective cushioning means, preventing noise. The plungers are also provided desirably, at a point between their upper and lower extremities, with knobs c^8. The bucket C carries, a pin c^9 engaging alternately with the two arms of the yoke a^{19} when the bucket is rocked, thus rocking the pin a^{18} in

engagement with the registering mechanism, thereby causing the registering mechanism to record each oscillation of the bucket.

The curvature of the sides of the dash-pot chambers is important with a bucket having rigid plungers. If the plungers were pivoted, which is a weak construction, the sides of the dash-pot chambers could be made straight, as usual; but, with a preferably rigid plunger, as in my construction, and for a dash-pot chamber of my desired size, it is my design to make the sides of the dash-pot chambers curved, so that the splasher-bars c^7 may swing clear into the chambers of the dash-pots (as graphically illustrated in Fig. 1), without wedging or jamming therein, as would be the case were the sides of the dash-pot chambers straight and of the same size as in my construction.

Operation. In the operation of my device, liquid is admitted through the inlet-opening a^{16}, passes through the hood a^{14} onto flange a^5, thence down through the nozzle a^8, into one of the compartments of the bucket C. When sufficient liquid has passed into one of the compartments of the bucket, the bucket will be rocked downward by the weight of the water therein, the pin c^9 on the bucket being thereby caused to engage with an arm of the yoke a^{19}, thus causing the pin a^{18} fast on the yoke to be rotated, which pin is in engagement with the registering mechanism, whereby the oscillation of the bucket is registered. The water then runs out of the end of the compartment, thence into the bottom of the casing, in a short time filling the dash-pots, as the dash-pots are located below the level of the outlet-openings, and, when the water reaches the level of the outlet openings a^3, it will be carried off rapidly, as the outlet openings are much larger than the inlet-opening a^{16}, whereby flooding or undesirable banking up of the water in the casing is prevented. By having the dash-pots on a plane lower than the outlet-openings, as shown in the drawings, liquid is always retained in them. The splasher-bars c^7 of the plungers being of less area than the dash-pot chambers, the liquid can escape only around the edges of the splasher-bars when they enter the dash-pots at each downward movement of the bucket, forming a liquid-cushion. The velocity of the bucket is decreased by this arrangement, and the noise avoided which would occur if, in the operation of the device, the adjusting screws c^5 were permitted to strike the bumpers b^3 without decreasing the momentum of the bucket before such striking of the bumpers by the screws. As the empty compartment rises, pressure of the water on the upper side of the splasher-bar c^7 operates as a slight brake on the ascending pair of plungers, and the oscillating action of the bucket is thereby rendered somewhat less abrupt; thus tending to avoid jar and strain. The device may have liquid supplied thereto by gravity or the same may be pumped into the casing through the inlet-opening a^{16}. The quantity of water allowed to flow into one of the compartments of the bucket is regulated by the adjusting screws c^5. It is obvious that, should either of the adjusting screws be carried farther into the boss c^4, its corresponding bucket-compartment would travel a relatively increased distance downward, and the liquid in the opposite compartment would thereby be allowed to rise to a higher elevation, and a greater quantity of the liquid would be contained in that compartment. The capacity of the other compartment would remain unchanged, unless the other adjusting-screw were changed to project a greater or less distance out of the boss. It will thus be seen that the device will operate to meter different quantities at the same time, and may be adjusted to meter varying quantities at different times.

It is important in a device of the character of my invention that exact quantities of water shall be measured at each oscillation of the bucket, and to this end positive means insuring such precise measurement must be provided. Such devices as spring-plates in the path of movement of the oscillating bucket, and against which the bucket strikes, as is customary, the spring-plate serving as a stop or abutment limiting the degree of downward movement of the bucket, will not answer my purposes; as not only does the bucket striking against the spring-plate cause a very great and objectionable degree of noise, but the spring plate yields to a certain extent and thus, by reason of this yielding, the correct and desired quantity of water cannot be measured. In other words, such devices as spring-plates are yielding stops. My abutments or bumpers b^3, in connection with the adjusting screws c^5, form a rigid stop, so that exact quantities of water may be positively measured.

Without limiting myself to the details of construction, as modifications of detail may be made without departing from the spirit of the invention, or sacrificing any advantages, and thus come strictly within the scope and purview of my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a meter, a casing, a funnel disposed and supported within the casing, and a scraper-device disposed within, and reciprocably movable lengthwise of the funnel to remove therefrom sediment collecting therein.

2. In a meter, a casing, a funnel disposed and supported within the casing, and a scraper-device disposed within, and reciprocably movable lengthwise of the funnel to remove therefrom sediment collecting therein,

and provided with manually-operable means extending outside of the casing.

3. In a meter, a casing, a funnel disposed and supported within the casing, and a scraper-device disposed within, and reciprocably movable lengthwise of the funnel to remove therefrom sediment collecting therein, and provided with an operating rod extending through the shell or side of the casing.

4. In a meter, a casing, a funnel disposed and supported within the casing, and a spear- or wedge-shaped scraper-device disposed within, and reciprocably movable lengthwise of the funnel to remove therefrom sediment collecting therein.

In testimony whereof, I affix my signature, in the presence of two subscribing witnesses.

JOHN DANIEL WALSH.

Witnesses:
CHARLES R. BISHOP,
ROBERT HALL.