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FLUID METER CONSTRUCTION

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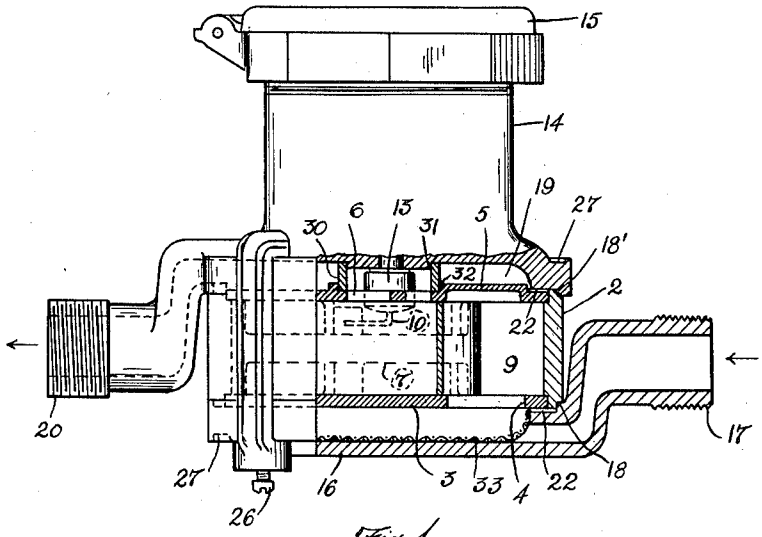


Fig. 1

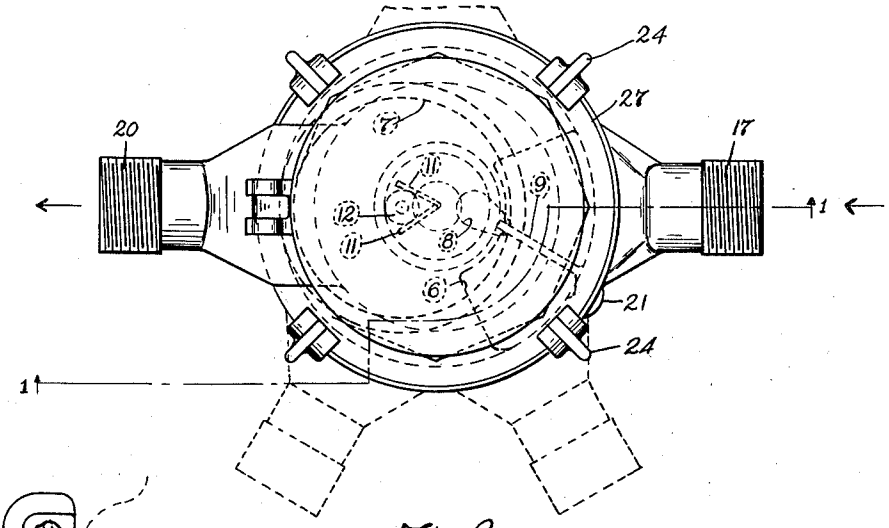


Fig. 2

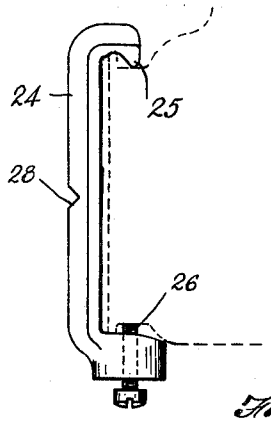


Fig. 3

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FLUID METER CONSTRUCTION

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7 Claims. (Cl. 73—273)

In fluid meters much difficulty is encountered from rusting and corrosion of screws and bolts in the castings, as holdings means, and in opening up such castings for purpose of making repairs it frequently happens that a casting part is so damaged from the impossibility of proper removal of screws or bolts imbedded therein, that the entire part has to be discarded, with corresponding loss. In accordance with the present invention however, it now becomes possible to assemble and disassemble meter parts, without the handicap of rusted-in screw threads, and access to the interior for repairs is a simple and inexpensive matter. As a further feature also, the meter parts may be assembled such that the inlet and outlet connections may be in various desired angular relation with respect to each other. As readily seen, this greatly simplifies the connecting-in of meters in awkward places, and renders unnecessary the considerable fitting with L's and connections, as frequently incurrent with the old forms of previous construction.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing:

Fig. 1 is a side elevational view, partly in section, showing an embodiment of the invention; Fig. 2 is a plan view; and Fig. 3 is an enlarged side elevation of the locking means.

As shown in the drawing, the construction includes a fluid-impeller chamber and a gear chamber, with inlet and outlet for the fluid chamber, in regulably assemblable form. The fluid chamber has a surrounding wall section 2, which may be of cylindrical form, and a back closure wall 3 with an inlet port 4 and a front closure wall 5 with an outlet port 6. While the invention is applicable with impellers of various construction, it is here illustrated with an impeller 7 of oscillating type, the peripheral notch 8 thereof straddling the fixed rib 9 of the housing, such that the impeller oscillates or rolls around the wall of the chamber under the impulse of the fluid and thereby passes along successive amounts thereof from inlet to outlet, and in its oscillation turning the shaft 10 by reason of the engagement of the arms 11 thereof about the roller 12 on the oscillating impeller. The shaft 10, extending through suitable stuffing box means 13, extends to gearing in the gear box 14, indicating pointers on a dial thence being positioned under an openable protecting lid 15, and since the details of these mechanisms may be of any of the known forms, further mention is unnecessary here. Covering the inlet port, in accordance with the invention, is an inlet chamber 16, assemblable over the port and associated portion of the impeller chamber, and having a projecting inlet connection 17, screw-threaded for joining to the line. The inlet chamber 16 is capable of rotary adjustment with respect to the impeller chamber 2, an annular shoulder 18 coacting with a converse annular shoulder on the wall 2. Similarly, an outlet chamber 19 is arranged assemblable for the outlet port 6, and leading to the outlet connection 20 screw threaded for taking on to the line. Surmounting the outlet chamber 19 is the gear box 14 and indicator means, and desirably an integral construction of the outlet chamber and gear box may be had. Similarly to the inlet chamber 16, the outlet chamber 19 is also rotarily adjustable with respect to the wall 2, and one convenient form of construction may likewise have an annular shoulder 18' engageable with a coacting shoulder on the wall 2. Thus, the inlet 17 and the outlet 20 are capable of regulable setting at various angles, a few of which are indicated in Fig. 2, and having in fact a range from directly adjacent on one side through a sweep of almost 360°, to directly adjacent on the other side. In some cases a locating mark or boss 21 on the wall 2 is of advantage in showing the location of the outlet port for instance. The assembly is locked in its position by external locking means, and fluid tight joints are provided by suitable means, ground joints or more usually packing rings 22. The locking means comprises locking-clamps 24 having lugs 25 and tightenable set screws 26 engageable on opposite shoulders of the inlet and outlet chamber members. Desirably, clamp-receiving grooves 27 may be provided in the shoulders, thereby further eliminating possibility of working loose. By providing in the clamp element 24 a weakening zone or cut 28, in the event of a freeze-up the clamps will yield at such point and allow bending in or a bending out of the end sufficient to allow it to slip off its shoulder and release the assembly and thereby prevent damage to the more delicate metering mechanism.

Surrounding the passageway of the shaft 10

in the chamber 19 is a collar 30 which may be liquid-tight fore and aft by gasketing or advantageously by telescoping fit within shoulders 31 and 32 on the respective walls. A strainer 33 in the inlet chamber may be in the form of a co-acting cupped disc seating over the inlet and nesting against the chamber wall thereabout. If the outlet and inlet chambers be of equal volumetric capacity, any imbalance on the piston or fluid-impelled metering element is avoided.

With the assemblage of the impeller chamber and inlet chamber and outlet chamber, and the locking-clamps 24 slightly loosened, the relative positions of the inlet and outlet 20 may be set to the angle desired, in view of the line-pipe requirements. With clamp-receiving grooves 27, relative rotation of the parts for such adjustment is simple without possibility of partial disassembly. With the angle between inlet and outlet at the desired placement, the locking screws 26 are tightened, and the assemblage is then in permanent set-up. If however in the course of time it should become necessary to make repairs in the interior of the device, it can be easily taken apart to the extent required, by removing the locking-clamps 24.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a fluid meter, a fluid-impeller chamber having a surrounding wall section, a back closure wall with an inlet port and a front closure wall with an outlet port, an inlet chamber assemblable over said inlet port and having an inlet connection, an outlet chamber assemblable over said outlet port and having an outlet connection, external shoulders on said inlet chamber and said outlet chamber, a gear box and indicating means carried by said outlet chamber, said inlet chamber and outlet chamber being rotary in their assembly for regulation of the angle between the inlet and outlet connections, fluid-tight joint means between the inlet chamber and the fluid-impeller chamber and between the fluid impeller chamber and the outlet chamber, clamp-receiving grooves on the shoulders of the inlet chamber and outlet chamber, and locking-clamps engageable in the grooves of said shoulders for locking the assembly together in adjusted relative position.

2. In a fluid meter, a fluid-impeller chamber having a surrounding wall section, a back closure wall with an inlet port and a front closure wall with an outlet port, an inlet chamber assemblable over said inlet port and having an inlet connection, an outlet chamber assemblable over said outlet port and having an outlet connection, a gear box and indicating means carried by said outlet chamber, said inlet chamber and outlet chamber being rotary in their assembly for regulation of the angle between the inlet and outlet connections, fluid-tight joint means between the inlet chamber and the fluid-impeller chamber and between the fluid-impeller chamber and the outlet chamber, and means permitting such rotary movement while the last-named means retains said chambers in assembly, said means including shoulders on the inlet chamber and outlet chamber and locking clamps engageable on said shoulders.

3. In a fluid meter, casing sections respectively for a metering member and an outlet connection and an inlet connection, gearing and indicating means on the outlet casing section, the outlet and inlet sections and connections being relatively rotatable in arcuate movement, and means permitting such movement while the last-named means retains the sections in assembly, said means including locking clamps and clamping shoulders on the outlet and inlet sections.

4. In a fluid meter, casing sections, an inlet connection on one said casing section and an outlet connection on another, a metering member in one of said casing sections, gearing and indicating means on one of said casing sections, the outlet connection being arcuately movable relative to the inlet connection, a shaft-enclosing collar in one of the casing sections, shoulders on the opposed walls of the casing section which contains the metering member and the adjacent section to engage said collar in a telescoping fit, and means permitting movement between the inlet and outlet connections while the last-named means retains the casing sections in assembly.

5. In a fluid meter, a metering chamber, casing sections with inlet and outlet connections for the metering chamber, the inlet to the metering chamber being adjacent to the periphery of the same, and the inlet and outlet connections being relatively movable arcuately to approach or recede from each other, and means permitting such movement while said means retains the parts in assembly.

6. In a fluid meter, casing sections, a metering member in one of said sections, inlet and outlet connections therefor in different casing sections and out of alignment with each other, the inlet to the metering member being adjacent to the periphery of one of the sections and the inlet and outlet connections being relatively movable arcuately to approach or recede from each other, and external holding members having tightenable screws and bridging across the outside and clamping the casing sections together and permitting relative arcuate movement between said inlet and said outlet connections, at least some of said holding members having cuts in their outer surface to allow bending under excess strain.

7. In a fluid meter, casing sections, a metering member in one of said casing sections, inlet and outlet connections therefor in different casing sections and out of alignment with each other, the inlet to the metering member being adjacent to the periphery of one of said sections and the inlet and outlet connections being relatively movable arcuately to approach or recede from each other, and external holding members having tightenable screws and bridging across the outside and clamping the casing sections together and permitting relative arcuate movement between said inlet and outlet connections.

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