Dec. 29, 1931. W. H. ANDREWS 1,838,729

LIQUID SAMPLING DEVICE

Filed March 24, 1930 2 Sheets-Sheet 1

Fig. 1.

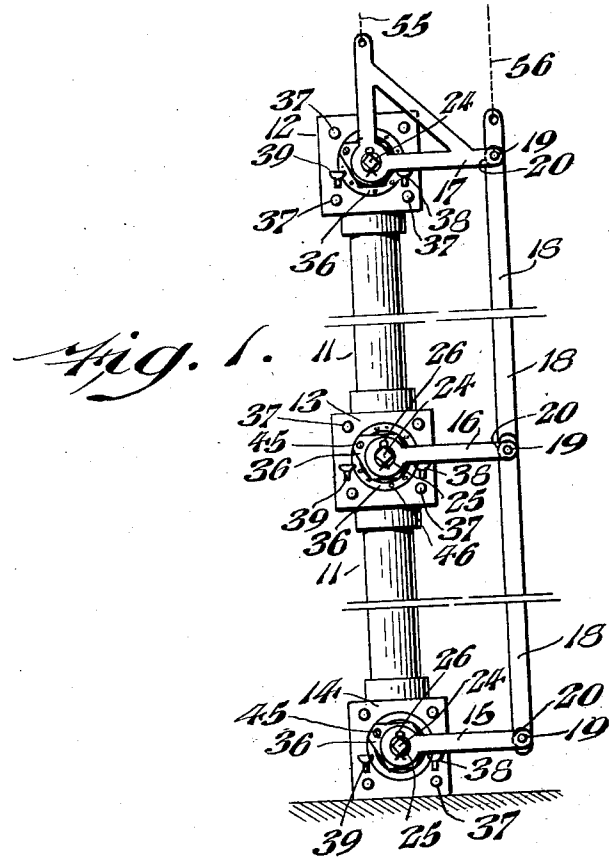
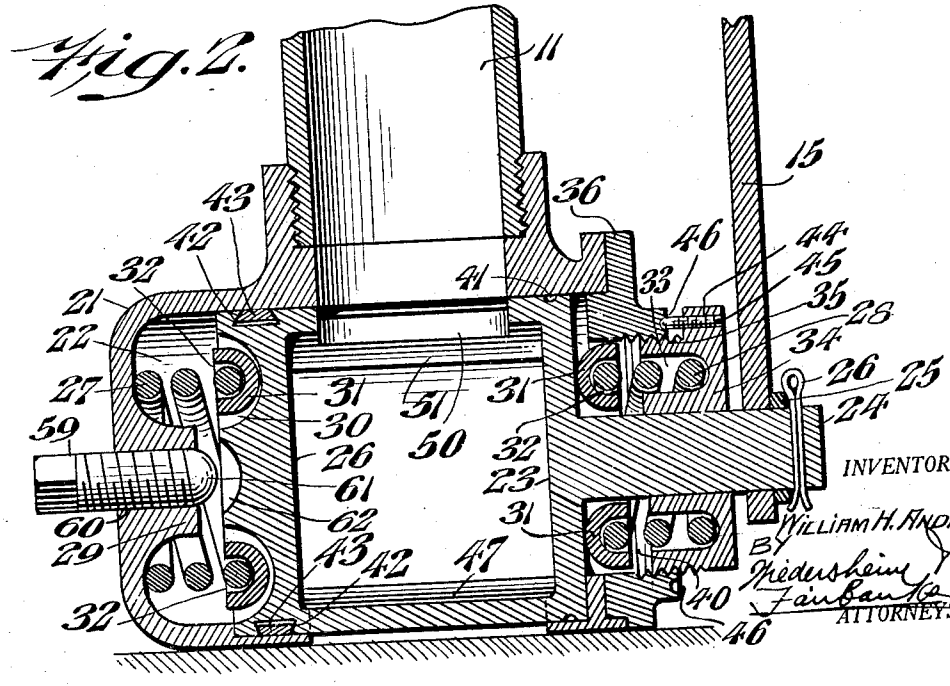


Fig. 2.



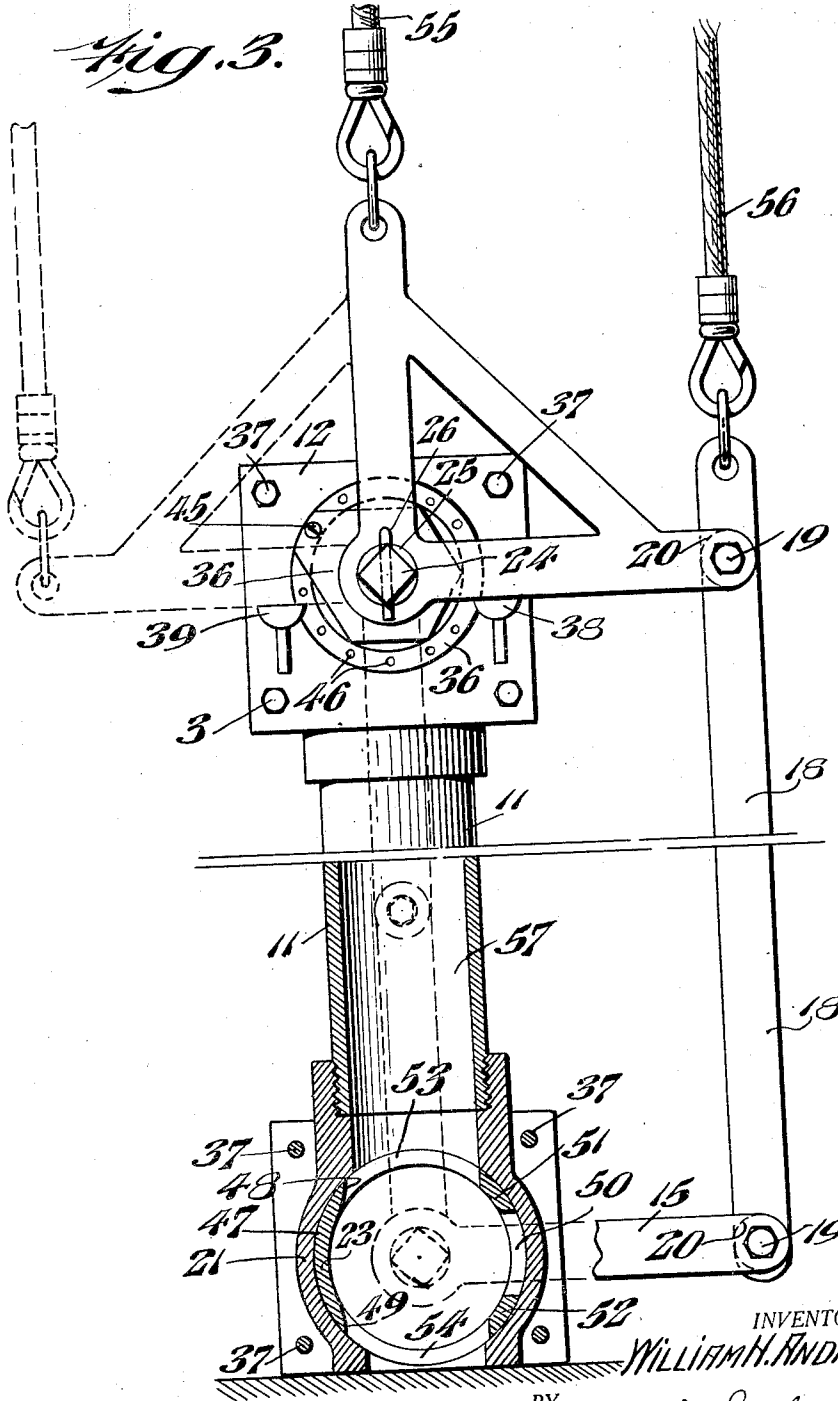
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Fig. 3.



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UNITED STATES PATENT OFFICE

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LIQUID SAMPLING DEVICE

Application filed March 24, 1930. Serial No. 438,549.

This invention, in general, relates to liquid sampling devices, having for its principal object the provision of improved means for sampling liquids, embodying certain desired conveniences and a more efficient apparatus for the purpose indicated.

Another object of the invention is the provision of a liquid sampling device including a plurality of valves which may be selectively or simultaneously actuated for the sampling of liquids at various depths.

A further object is to provide an improved valve for facilitating the sampling of liquids.

Other and further objects of the present invention not at this time appearing will be disclosed hereinafter.

At the present time, particularly in the oil refining industry, it is important to obtain samples of material at the lowest points possible in the large storage tanks with a view to the determination of the nature and salient characteristics not only of the general body content of the storage tank, but also with a view to ascertaining the relative amount of sediment and moisture in the lower strata of the liquid.

For the purpose of illustrating my invention I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the drawings:—

Fig. 1 is a front elevational view of the exterior or an embodiment of my invention in which I have incorporated, by way of illustration, three valves;

Fig. 2 is an enlarged longitudinal sectional view of one of the valves embodying my invention forming part of the device; and

Fig. 3 is a fragmentary transverse sectional view, partly in elevation, of the device.

In the drawings, wherein similar numerals of reference indicate corresponding parts in the several views of the preferred form of the invention, 11 designates sections of tubes or pipes operatively joining a plurality of similar valves 12, 13, 14, which valves may be joined together for synchronous movement by the lever arms 15 and 16 and the bell crank lever 17, these latter being joined by the rod or strap 18, which is clamped to the said lever arms and bell crank lever by the bolts and nuts 19; the usual washers 20 being inserted between the nuts and the adjacent face of the strap 18.

Each of the valves embodying my invention comprises a valve body or casing 21, the longitudinal sectional configuration of which is best shown in Fig. 2. Within each of the valve chambers 22 of the valve casing 21 a hollow plug cock 23 is rotatably confined, the plug cock having a stem 24 which is engaged by one of the respective lever arms 15 or 16, etc., these lever arms being secured on their respective stems 24 by the washers 25 and cotter pins 26 passed through a hole on each of the said stems, as clearly shown in Fig. 2. The plug cock 23 is maintained in operative position in the valve chamber 22 by springs 27—28, the springs 27 being coiled in position about the projection 29 which forms a part of the inner surface of the valve casing 21 within the valve chamber 22. The plug cock 23 is formed on one side with semi-cylindrical recesses 30 in which are seated the semi-annular ring members 31 having grooves 32 in which the spring 27 is adapted to seat. By inspection of Fig. 2, it will be seen that the plug cock 23 on another side is engaged by a plurality of other semi-annular members 31 having similar grooves 32 in which the spring 28 is seated, it being observed that the latter is retained in an annular pocket 33 formed in an adjusting nut 34, which latter has a threaded portion 35 engaging a gland 36 which is secured to a face of the valve casing 21 by bolts 37, the gland 36 having stops 38—39, against which the lever arms 15, 16, and 17 abut when carried to set the valves at open and closed positions respectively. When the adjusting nut 34 is turned, it will be noted that a chamber 40 provides suffi-

cient room for the compression and expansion of coil spring 28.

With a view to maintaining a liquid-tight seal in the valve chamber, an annular groove 41 is formed in the plug cock, which latter is adapted to receive any oil or liquid that might possibly seep out in this direction from the contents within, in this manner serving as an auxiliary liquid seal or packing, while a dove-tailed groove 42 is formed in another part of the plug cock 23 in which a suitable metal or ring packing 43 is inserted. For the purpose of lockingly securing the adjusting nut 34 in position, a threaded hole 44 is provided in which headless screws 45 are engaged, the latter being received in pockets 46 formed in the gland 36 when the adjusting nut 34 is turned to register the screws 44 with the pockets 46.

As best shown in Fig. 3, the hollow plug cock 23 is formed with an arcuate portion 47 having bevelled edges 48—49 which are adapted to scoop the greatest possible amount of material enclosed within the hollow portion of the plug cock 23. Opposite the arcuate portion 47 the plug cock 23 is formed with a cut-out portion 50 on either side of which lies the bars or straps 51—52, separated from the bevelled edges 48—49 by openings or ports 53—54, from which it will be observed, by an inspection of Figure 3, that a three-way opening is provided in my valve.

The function and manner of operation of my invention has been in large measure indicated from the foregoing details, but will be made more fully apparent in the following brief description.

Assuming the valves to be open in the position indicated in Figure 3, the entire assembly of valves is lowered by the cable 55 into the vessel containing the liquid to be sampled, which liquid will ascend through the valves 12, 13 and 14 and the pipe sections 11 to its own level in the vessel. The other cable 56 will now be operated to swing the lever arms 15, 16 and the bell crank lever 17 through the strap 18 at right angles to the position indicated in Fig. 3. The valves will now be closed, the arcuate portion 47 closing the passage-way 57 through the pipe sections 11. In the closed position of the valves, the assembly will now be lifted from the vessel and the contents of each valve chamber one at a time emptied and inspected by disconnecting lever arm 15 from strap 18.

I have in addition to the adjusting means, shown at the right of the valve assembly (i. e. the adjusting nut 34 together with the springs 28 and the semi-annular members 31) provided separate means for ejecting the plug cock 23 from the valve chamber 22, this means consisting in a bolt 59 which is threadedly engaged in a hole 60 passing through the re-entrant projection 29, it being observed that the rounded end 61 of the adjusting bolt 59 is received in a cup-like depression 62 formed in an end of the plug cock 23.

It will now be obvious that when the bolt 59 is turned in a clock-wise direction the plug cock may be thrust bodily outward which procedure is occasionally necessary when it is necessary to remove the plug for inspection, repairs, and to free it from a rusted or frozen seat.

It will thus be seen that the method and construction employed in the present valve may be applied to valve construction in general in addition to the objects and utilities of the invention as a whole; hence, while I have described with particularity a preferred form of the invention, I do not confine myself to the precise details but reserve the right to make such variations, changes, and embodiments as fairly fall within the scope of the appended claim.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claim rather than to the foregoing description to indicate the scope of the invention.

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

A liquid sampling device of the kind described comprising, a plurality of valves each including an open casing and a plug cock adapted to close said casing, said valves being connected by pipe sections affording a common passage-way through the valves, movable arms connected to said plug cocks, said arms being connected by an element common thereto, and means on said element for separately connecting and disconnecting said arms, whereby said valves may optionally be actuated in unison or individually.

WILLIAM H. ANDREWS.