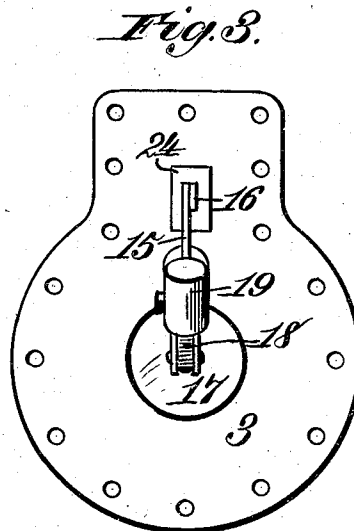
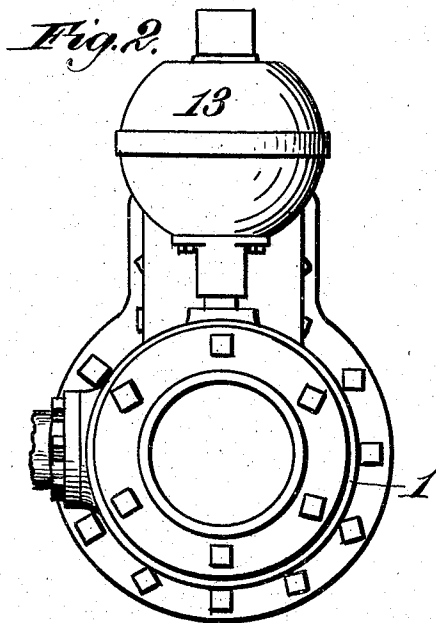
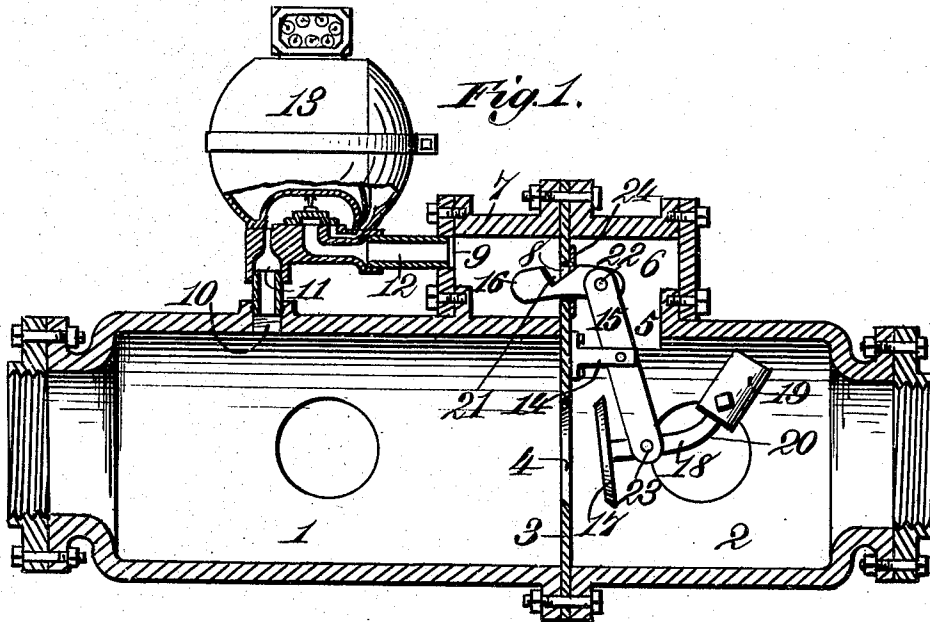


H. P. WESTCOTT.
 PROPORTIONAL METER.
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1,045,229.

Patented Nov. 26, 1912.



Witnesses:
 Robert Smith.
 J. B. Keefe

Inventor:
 Henry P. Westcott.
 By James L. Norris.
 Atty.

UNITED STATES PATENT OFFICE.

HENRY P. WESTCOTT, OF CHANUTE, KANSAS.

PROPORTIONAL METER.

1,045,229.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed May 29, 1908. Serial No. 435,820.

To all whom it may concern:

Be it known that I, HENRY P. WESTCOTT, a citizen of the United States, residing at Chanute, in the county of Neosho and State of Kansas, have invented new and useful Improvements in Proportional Meters, of which the following is a specification.

This invention relates to a proportional gas meter and the primary object of the same is to measure natural gas or air at any pressure in large quantities and to arrive at this result without the use of springs, diaphragms, oil or sealing fluid to open the main valve and embodying a minimized number of fastening devices and thus simplify the association of the valve mechanism in devices of this class.

Among the advantages incidental to the meter embodying the features of this invention there are special ones consisting in obtaining a constant pressure against the main valve by a weight and in the use of a vertical valve to avoid collection of dirt or sediment thereon, and also the proportional flow of the fluid through the meter is positively regulated and the tally mechanism, which may be of any approved construction, is not trammelled or affected in its operation by an irregular or counterflow, but, on the contrary, is operated by a direct flow and a quick outlet.

Other structural advantages will be particularly hereinafter enumerated.

In the drawing: Figure 1 is a longitudinal vertical section of a meter embodying the features of the invention. Fig. 2 is an end elevation of the same. Fig. 3 is a detail elevation showing the valve plate and main and proportional valves.

Similar characters of reference are employed to indicate corresponding parts in the several views.

The numerals 1 and 2 respectively designate inlet and outlet bowls, the inlet bowl being somewhat longer than the outlet bowl for a purpose which will be presently explained, and between the two bowls a vertical valve plate 3 is interposed and projects above the top surfaces of the bowls. The valve plate 3 has an opening 4 therein in central relation to the two bowls and the inner extremity of the upper portion of the bowl 2 adjacent to the valve plate is cut away or slotted as at 5. Over the joint between the inner extremities of the bowls 1 and 2 a proportional valve chamber 6 is

applied and is composed of separable parts or members as shown and vertically intersected by the upwardly extending portion of the valve plate 3 which is held by the top 7 of the said chamber. The upper portion of the valve plate 3 within the chamber 6 is formed with a proportional valve opening 8, and the end of said chamber over the bowl 1 has a tapped opening 9. The bowl 1 at a suitable distance from the adjacent open end of the chamber 6 also has a tapped or screw-threaded opening 10, the openings 10 and 9 respectively having the inlet 11 and outlet 12 of a Tobey tally or meter 13 secured thereto and disclosed in Letters Patent 487,907, granted December 13, 1892, to H. A. Tobey. As hereinbefore explained, the bowl 1 has greater length than the bowl 2, and this difference in length is to accommodate the application of the Tobey tally or meter on the bowl 1 and set up a direct inlet and outlet between the said bowl and Tobey meter or tally and the chamber 6, the outlet 12 being direct from the said patented meter to the chamber 6.

The valve mechanism carried by the valve plate 3 is very simple in its construction and operation. Projecting horizontally outward from one side of the valve plate 3 into the outlet bowl 2 is a fulcrum post or projection 14, to which is intermediately secured, to have free rocking movement, a valve bar 15, and attached to opposite upper and lower extremities of this bar are two valves, the upper valve 16 being movably disposed in the opening 8 and constituting a proportional valve, and the lower valve 17 constituting the main valve and having a stem 18 to which the lower end of the bar 15 is attached. The valve 17 coacts with the valve opening 4 and on the outer extremity of the stem 18 a pressure regulating weight 19 is secured, the outer end of the stem being curved or deflected upwardly as at 20. The proportional valve 16, while free to move through the opening 8, snugly fits the latter and is notched or recessed in its upper edge as at 21 to regulate the quantity of fluid passing through the opening 8 by movement of the said proportional valve in consonance with the movement of the main valve 17 in accordance with fluctuations of pressure.

It will be seen that the outlet bowl 2 is an exact counterpart of the inlet bowl with two exceptions, namely, the inlet bowl is

longer than the outlet bowl to accommodate the application of the Tobey tally or meter; and the outlet bowl is cut away or slotted as hereinbefore explained. The valve plate is preferably of the contour shown by Fig. 3 and the same size as the inner ends of the two bowls. Though the parts of the meter are not confined to any exact proportions or dimensions, experiment has demonstrated that certain sizes are preferable and the main valve 17, when used with a ten or twenty-thousand cubic feet per hour meter and open with the gas should be six inches in diameter. The proportional valve 16 is preferably elongated and formed with rounded ends, being given a longitudinal arcuate contour, as clearly shown by Fig. 1, and in practice will be formed from brass and be one inch wide, one-quarter of an inch thick, and three inches long. While these proportions are preferred, it will be understood that they may be modified. Both the main and proportional valves operate centrally in relation to the outlet bowl 2 and the portion of the valve plate 3 intersecting the two bowls and the center of the part of the said valve plate which intersects the chamber 6. The proportional valve 16 has one end connected to the bar 15 by a small bolt 22, and the lower extremity of the bar 15 is likewise secured to the stem 18 by a single bolt 23. The stem 18 extends at right angles from the center of the main valve 17 and the upward deflection of the said stem is at about a forty-five degree angle. The weight 19 will be varied from three to eight pounds in accordance with the size or dimensions of the meter, and for a meter of the dimensions shown in the drawing it has been found that a weight of three pounds is sufficient to insure an accurate operation of the meter. The wall of the valve opening 4 as well as the edge of the main valve 17 is beveled, the bevel of the wall and valve edge being outwardly in the direction of the outlet bowl. The proportional valve seat consists of a thin brass plate 24 suitably secured to the main plate. It will be understood that instead of using bolt fastenings between the valves and bar 15 and the fulcrum post or projection 14, suitable rivets may be employed to avoid working loose of the several parts, but this is a matter of selection and may be determined by practice. The notch or slot 21 in the proportional valve is preferably filed out by hand during the meter test to obtain a correct opening to pass one per cent. of any volume of gas or air passing through the meter up to the capacity of the latter. The proportional valve controls the gas that has passed through the Tobey tally or meter by direct flow and causes an accurate registration of the cubic feet in accordance with the pressure within the bowls. It will be observed that the bar 15

is a balancing medium with respect to the two valves 16 and 17 and the weight 19 controls the open and closed condition of the valve opening 4 through the medium of the main valve 17 and simultaneously the valve 16 likewise opens and closes, and this simultaneous action of the valves is effected without relying upon the use of springs, diaphragms, or sealing fluids and hence the particular valve mechanism will be more reliable and accurate in its operation. Both valves are so shaped and positioned as to be free of accumulations of dirt or sediment with advantages in accuracy of operation and particularly as compared to the usual form of horizontal valves.

Both valves, valve seats, connecting means for the valves or the bar 15, the weight 19, and the attaching devices are rigidly secured to and carried by the main plate 3, and this plate may be easily removed and likewise the tally meter 13 may be readily detached and thus permit the owner of the meter in the field to ship the main plate, without disturbing the valves and the tally meter 13, to the factory at a small expense and minimized loss of time for repair or readjustment without requiring the return to the factory of the bowls 1 and 2 and the chamber 6. Furthermore, in view of this advantageous assemblage it is possible to test and correct valvular inaccuracies and irregularities in the operation of the tally meter 13 in the factory when sent to the latter for repairs in any stock set of castings, or bowls 1 and 2 and chamber 6, and returned to the meter owner in correct condition. A further structural advantage is that the balance bar 15 between the main and proportional valves 17 and 16 being secured substantially solid to the main valve stem 18 and to the center support or post 14 and proportional valve 16, practically makes a solid connection with but one removable bolt which engages the support or post 14 between the main and proportional valves, and hence there will be but little chance for disarrangement and inaccurate measurement.

The meter embodying the features of the invention may be used for measuring any kind of gas or fluid, and instead of the Tobey tally, which is illustrated as one means for rendering the meter effective, any other analogous or suitable tally mechanism may be employed so long as the outlet from the tally mechanism is directly connected to the proportional valve chamber, as hereinbefore explained.

Having thus described the invention, what is claimed as new, is:

1. In a meter of the class specified, inlet and outlet bowls, the inlet bowl being longer than the outlet bowl, a proportional chamber superimposed on the bowls and having communication with the outlet bowl, a tally

mechanism separably disposed on the inlet bowl and having feeding and outlet communication respectively with the inlet bowl and the said chamber, and a valve organization separably interposed between the inlet and outlet bowls and extending into and cooperating with the proportional chamber to control communication between the inlet and outlet bowls and regulate the proportional flow of a fluid through the meter.

2. In a meter of the class specified, the combination of inlet and outlet bowls, a proportional chamber superimposed on the bowls and communicating with the outlet bowl, a tally mechanism separably disposed on the inlet bowl and respectively having feeding and outlet communication with the inlet bowl and chamber, a main valve plate separably interposed between the inlet and outlet bowls and extending through the chamber and provided with upper and lower openings, and upper and lower valves movably connected to the said plate and cooperating with the upper and lower openings, the valves being simultaneously removable and applicable with the plate.

3. In a meter of the class specified, the combination of inlet and outlet bowls, a proportional chamber superimposed on the bowls and communicating with the outlet bowl, a tally mechanism having feeding and outlet communication respectively with the inlet bowl and the chamber, a main valve plate separably interposed between the inlet and outlet bowls and extending through the chamber, the said plate having upper and lower valve openings to establish communication between different parts of the chamber and between the inlet and outlet bowls, and an upper proportional valve and a lower main valve connected for simultaneous movement and movably attached to the said plate, the valves and plate being removable and applicable as a unit with relation to the bowls and chamber.

4. In a meter of the class specified, the combination of inlet and outlet bowls, a proportional chamber superimposed on the bowls and communicating with the outlet bowl, a tally mechanism having feeding and outlet communication respectively with the inlet bowl and the chamber and removably applied on the inlet bowl, a main valve plate separably interposed in vertical position between the inlet and outlet bowls and extend-

ing through the chamber, the said plate having upper and lower valve openings to establish communication between different parts of the chamber and between the inlet and outlet bowls, and an upper proportional valve and a lower main valve connected for simultaneous movement and movably attached to the said plate, the valves and plate being removable and applicable as a unit with relation to the bowls and chamber.

5. In a meter of the class specified, the combination of inlet and outlet bowls, a proportional chamber superimposed on the bowls and communicating with the outlet bowl, a tally mechanism having feeding communication with the inlet bowl and also having its outlet directly connected to one extremity of the proportional chamber, a main valve plate separably interposed between the inlet and outlet bowls and extending through the chamber, a balancing bar movably attached to the plate, a proportional valve secured to one end of the bar and provided with a notch, the proportional valve being movable through the plate, and a weighted main valve on the opposite end of the bar and controlling communication between the inlet and outlet bowls.

6. A meter of the class specified having an inlet and an outlet, a proportional chamber having communication with the outlet, a tally mechanism having communication with the inlet and proportional chamber, a valve plate vertically disposed between the inlet and outlet and projecting through the chamber, the said plate having upper and lower openings, a balancing bar movably connected to the plate, a proportional valve secured to the upper end of the bar and movable in the upper opening of the plate, the said proportional valve having a notch in its upper portion, and a main valve secured to the lower end of the bar and located in the outlet, the said main valve having a stem with an upwardly deflected terminal carrying a weight.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY P. WESTCOTT.

Witnesses:

C. J. PRIOR,
F. H. PAYNE.