No. 814,359. PATENTED MAR. 6, 1906.

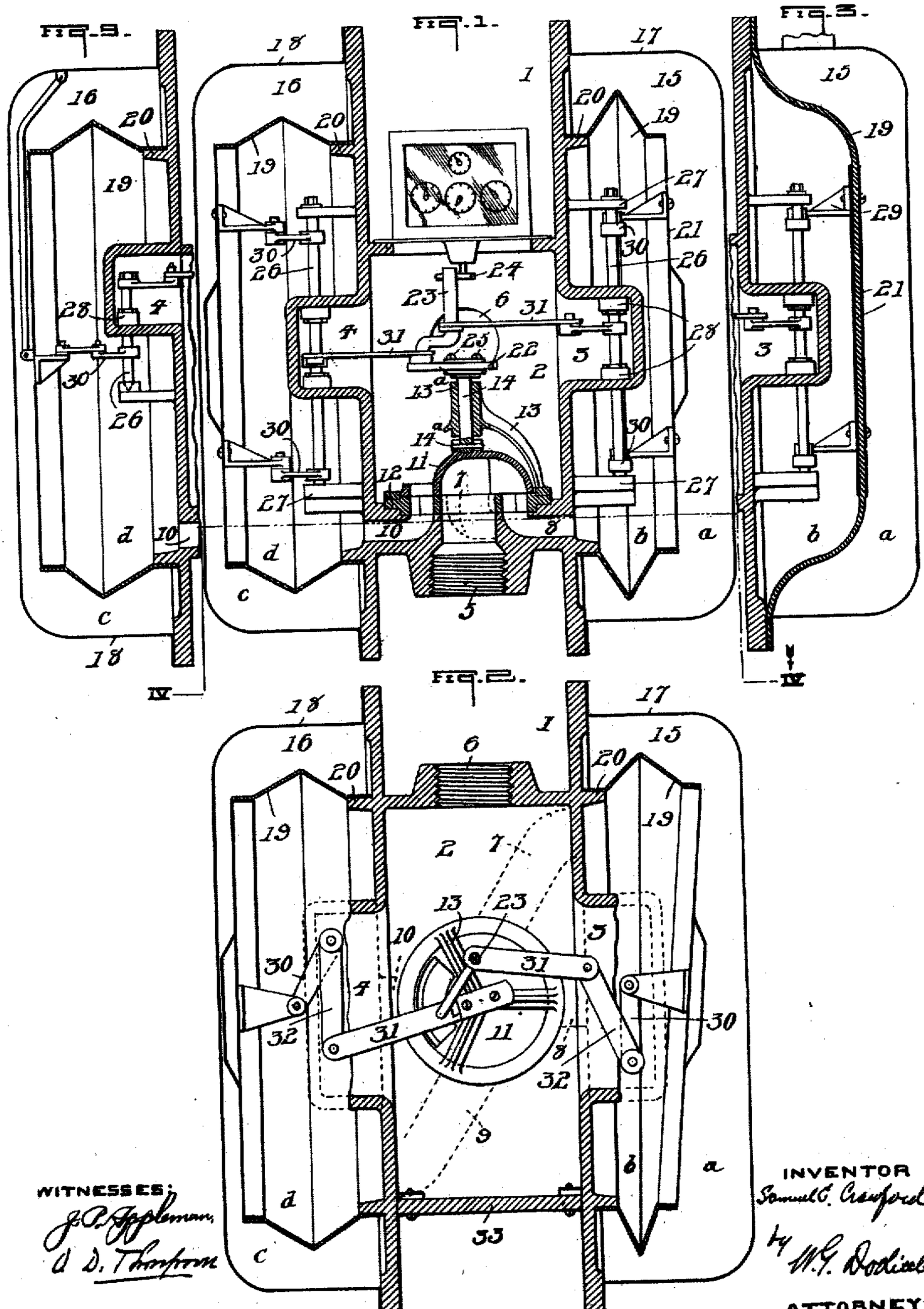
S. E. CRAWFORD.

GAS METER.

APPLICATION FILED AUG. 16, 1905.

2 SHEETS—SHEET 1.

Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

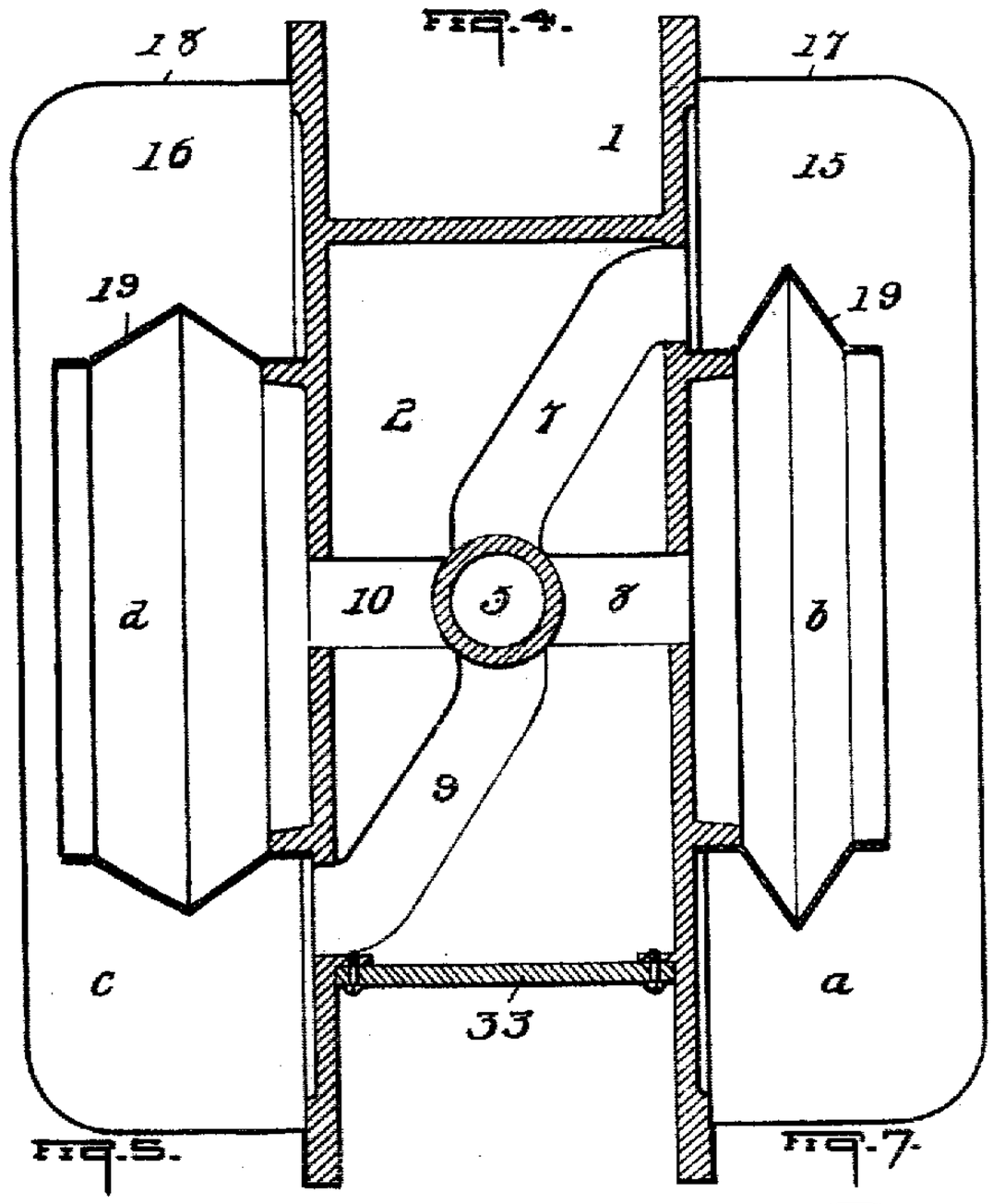


Fig. 5.

Fig. 7.

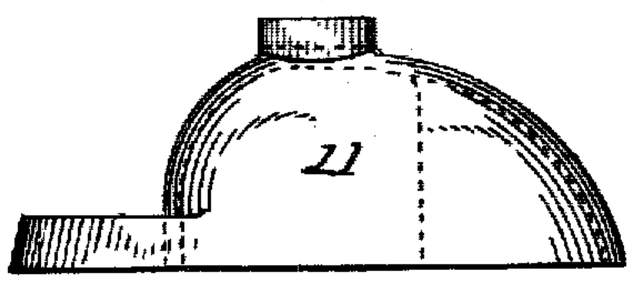
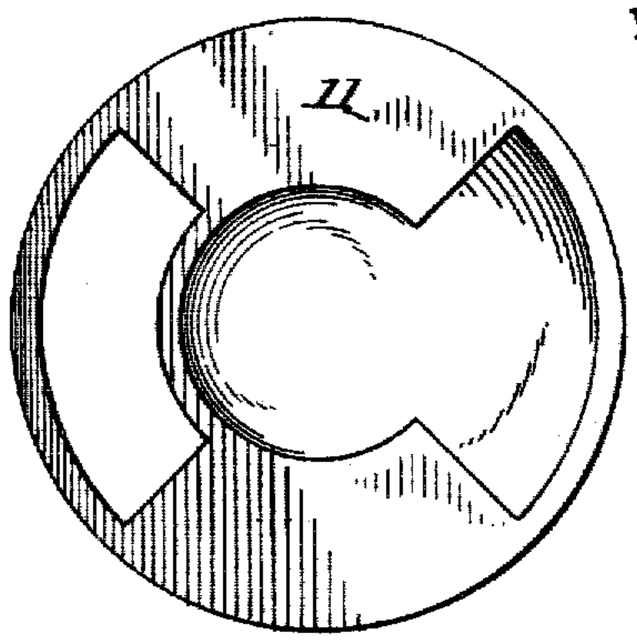


Fig. 6.



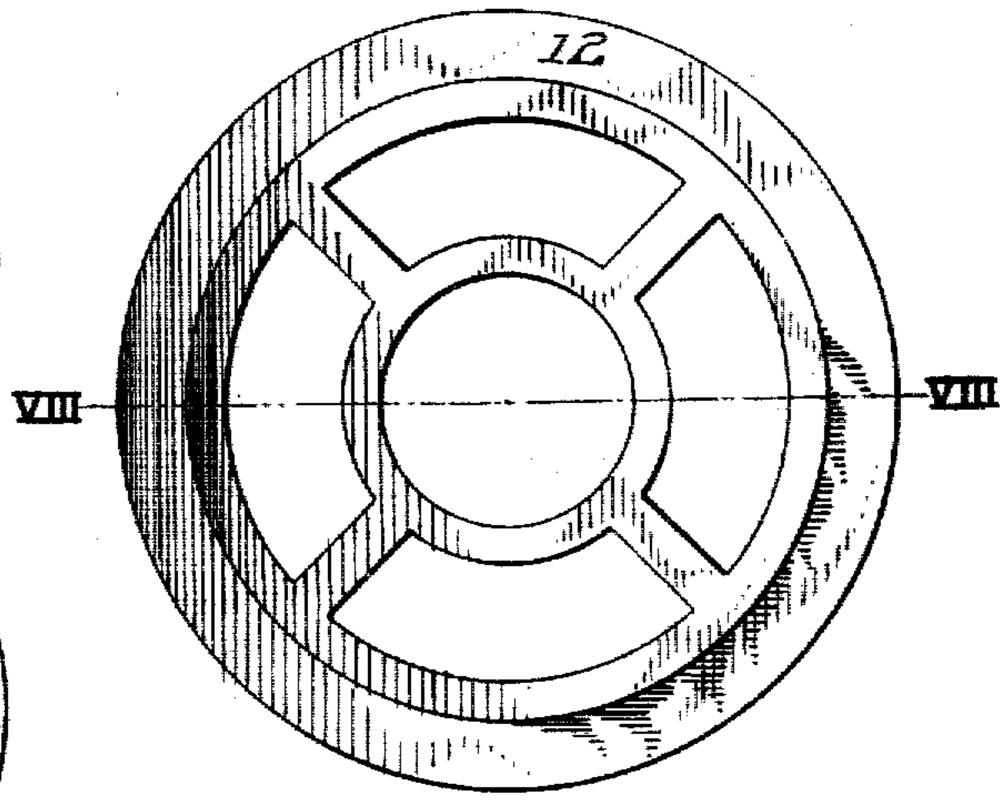


Fig. 8.

WITNESSES:

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SAMUEL E. CRAWFORD, OF AVALON, PENNSYLVANIA.

GAS-METER.

No. 814,359. Specification of Letters Patent. Patented March 6, 1906.

Application filed August 18, 1905. Serial No. 274,690.

To all whom it may concern:

Be it known that I, SAMUEL E. CRAWFORD, a citizen of the United States, residing at Avalon, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Gas-Meters, of which the following is a specification.

The object of my invention is to provide a new and improved gas-meter; and to this end my invention consists in a gas-meter, in the novel features of construction, and in the combination of parts, all as hereinafter described and claimed.

In the accompanying drawings, which illustrate applications of my invention, Figure 1 is a central vertical sectional view of a meter constructed in accordance with my invention; Fig. 2, a part top plan and a part sectional view; Fig. 3, a detail sectional view showing a modified form of diaphragm and manner of mounting the same; Fig. 4, a detail horizontal sectional view taken on line IV IV of Fig. 1; Fig. 5, an elevational view of valve; Fig. 6, a bottom plan view of valve; Fig. 7, a plan of valve-seat; Fig. 8, a central vertical sectional view of valve-seat, taken on line VIII VIII of Fig. 7; and Fig. 9 is a sectional detail view of a modified construction.

Referring to the drawings, as illustrated and as preferred, the body portion 1 of the meter is formed with a central chamber 2 and with side chambers or spaces 3 and 4. It is further provided with an inlet-nozzle 5, an outlet 6, and with passages 7, 8, 9, and 10. Located in chamber 2 is a valve mechanism comprising a rotary valve 11, which is mounted on a four-ported valve-seat 12, a valve-cage 13, having a sleeve 13^a, and a valve-stem 14. As shown, valve-stem 14 is attached at its lower end to rotary valve 11 by a small driving-pin 14^a, but, if desired, the valve-stem may be formed integral with the valve. The valve mechanism, as clearly shown by Fig. 1, is supported by its seat 12, which latter fits over the inlet-nozzle 5. Fluid-passages 7, 8, 9, and 10 communicate with the rotary valve 11 and with measuring-chambers 15 and 16.

Measuring-chambers 15 and 16 are formed between the outer surfaces of the walls of the body portion and side covers 17 and 18, and located within each chamber is a diaphragm 19. Flexible diaphragms 19 in the form of Fig. 1 are each secured to a ring 20, formed on the body portion, and to a diaphragm plate 21. In the modified construction shown by Fig. 3 I employ a slightly different form of diaphragm-leather, and in this instance the diaphragms are held in position between the body portion and the side covers.

Measuring-chamber 15 is divided by the diaphragm within said chamber into an outer compartment *a* and an inner compartment *b*, and chamber 16 is divided by its diaphragm into corresponding compartments *c* and *d*. These several compartments *a*, *b*, *c*, and *d* are respectively connected up with the valve mechanism by the passages 7, 8, 9, and 10. This construction provides for a displacement of a predetermined volume of fluid from both sides of each diaphragm-plate with every revolution of the rotary valve.

Valve-stem 14 at its upper end has formed therewith or connected thereto an adjustable crank 22, having an arm 23. Arm 23 is arranged when rotated to engage a crank 24 of the registering mechanism. The crank 22 is adjustable by means of screws 25.

For the direct horizontal transmission of operative motion from the diaphragms to the valve mechanism I have shown two forms of construction. In the form of Fig. 1 I employ two partially-revolving shafts 26, which are supported near their ends in suitable bearings on projections 27, extending outwardly from the body portion. These shafts extend through the walls of side chambers or spaces 3 and 4 and through stuffing-boxes 28, located within said spaces 3 and 4. In this construction four stuffing-boxes 28 are shown, two in each side chamber. Each shaft 26 is connected outside of the central chamber or the side chambers to the respective diaphragm-plates 21 by means of brackets 29 and rocker-arms 30, the latter being rigidly secured to the said shafts. Within the central chamber the shafts are connected up with crank-arm 23 by means of connecting-links 31 and rocker-arms 32. In the form of Fig. 9 the shafts 26 are not extended through two walls of the side chambers. Consequently it is only necessary to employ one stuffing-box in each side chamber. This form of Fig. 9 also differs somewhat from the form of Fig. 1, in that each diaphragm-plate is connected with each shaft by means of one bracket 29 and one rocker-arm 30. The stuffing-boxes in each form, however, are disposed within the side chambers or wings of the central chamber.

For the purpose of permitting access to the interior of the central and side chambers and to the valve mechanism, operative parts, and

stuffing-boxes located in said chambers I provide a door 33, attached to the body portion, as shown by Figs. 2 and 4.

Gas entering the inlet-passage 5 will pass to the respective compartments *a* and *b* of measuring-chamber 15 and *c* and *d* of the measuring-chamber 16 through their respective passages 7 and 8 and 9 and 10, and from said compartments through the said passages 7, 8, 9, and 10 to the central chamber, and thence to outlet 6. The passage of the gas to and from the compartments of the measuring-chambers is controlled by the rotary valve 11, operated upon the ported valve-seat 12. The position of the parts, as shown by Fig. 1, is such that gas will pass through passage 8 to compartment *b* and escape from compartment *d* through passage 10 to the central chamber 2. The movements of the diaphragms caused by the pressure of gas thereon rock the shafts 26, and a rotary motion is imparted to the valve 11 through said rocker-shafts 26 and the intermediate mechanism. As stated above, the valve mechanism and other parts are so arranged as to provide for a displacement of a volume of gas from both sides of each diaphragm-plate with every revolution of the rotary valve.

What I claim is—

1. In a gas-meter, a body portion formed with a central chamber, side measuring-chambers, a diaphragm in each measuring-chamber, a rotary valve mechanism located in the central chamber and between the diaphragms, a link connection located in the central chamber, and means comprising a rocking shaft connecting each diaphragm and the link connection arranged to effect a horizontal transmission of operative power from the diaphragms to the valve mechanism.

2. In a gas-meter, a body portion formed with a central chamber and two side chambers or wings, side measuring-chambers a diaphragm in each measuring-chamber, a rotary valve mechanism located between the diaphragms, and means connecting the diaphragms and valve mechanism comprising, a rocking shaft extending into each side chamber or wing, and a stuffing-box for each shaft located in each side chamber or wing.

3. In a gas-meter, a body portion formed with a central chamber and side chambers or wings in communication with the central chamber, a rocking shaft in each side chamber side measuring-chambers, a diaphragm in each measuring-chamber, and a rotary valve mechanism located in the central chamber between the diaphragms and connected up with the rocking shafts.

4. In a gas-meter, a body portion having a central chamber, measuring-chambers, a diaphragm dividing each measuring-chamber into an inner and an outer compartment, side chambers extending from the central chamber into the inner compartments of the measuring-chambers, a rotary valve mechanism in the central chamber, and means comprising a rocking shaft connecting each diaphragm with the rotary valve mechanism.

5. In a gas-meter, a central chamber, measuring-chambers each divided by a diaphragm into two compartments, side chambers between the measuring-chambers and the central chamber, a rotary valve mechanism located in the central chamber between the diaphragms, and means connecting each diaphragm and valve mechanism comprising a rocking shaft extending into each side chamber, and provided with a rock-arm within each side chamber, and a rock-arm within each inner compartment of the measuring-chambers.

6. In a gas-meter, a body portion formed with a central chamber, side measuring-chambers outside of the body portion, a diaphragm in each measuring-chamber, a rotary valve mechanism located in the central chamber and between the diaphragms, and means for effecting a horizontal transmission of power from each diaphragm to the rotary valve mechanism comprising a rocking shaft and means connecting the rocking shaft and the valve mechanism.

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

SAMUEL E. CRAWFORD.

Witnesses:
W. G. DOOLITTLE,
MARGARET HUGHES.