No. 638,457. Patented Dec. 5, 1899.

C. W. HINMAN.

GAS METER.

(Application filed June 19, 1896.)

(Model.) 2 Sheets—Sheet 1.

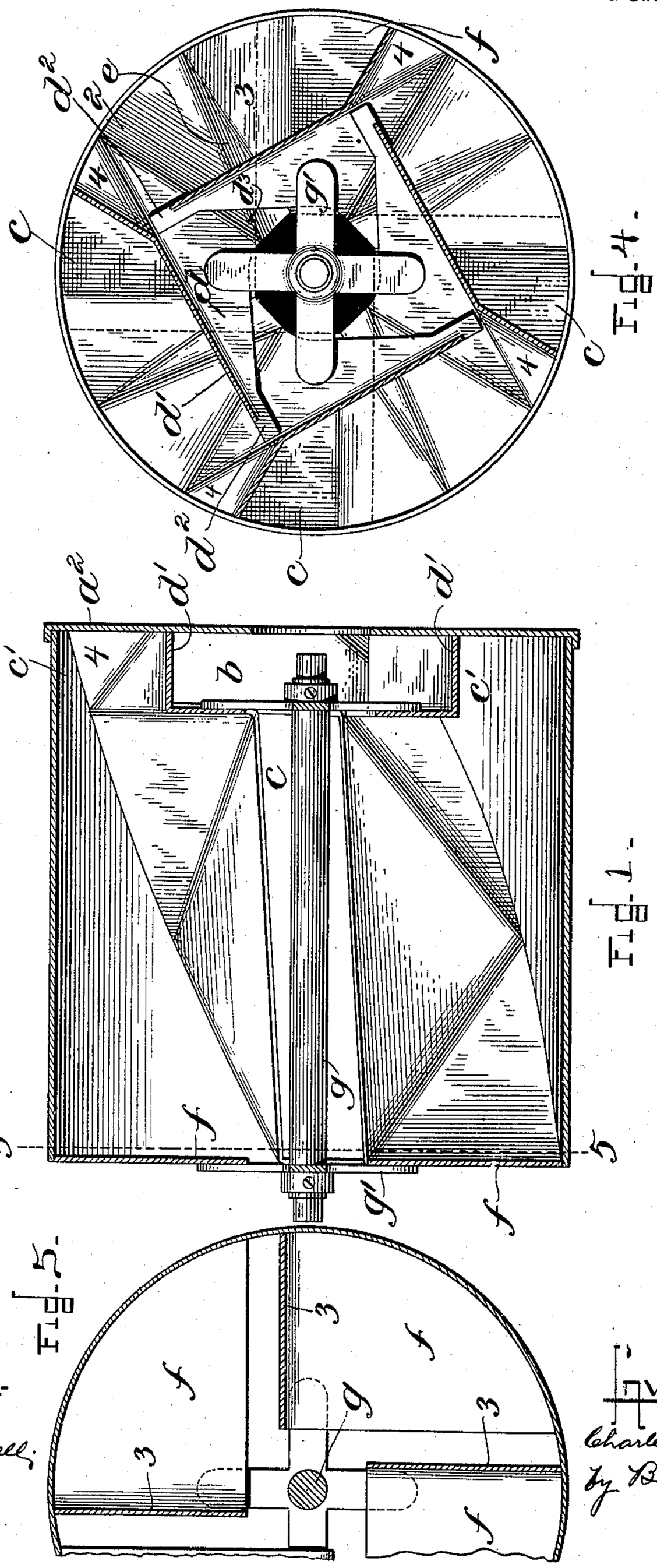

Fig. 4.

Fig. 1.

Fig. 5.

Witnesses.
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A. D. Parker.

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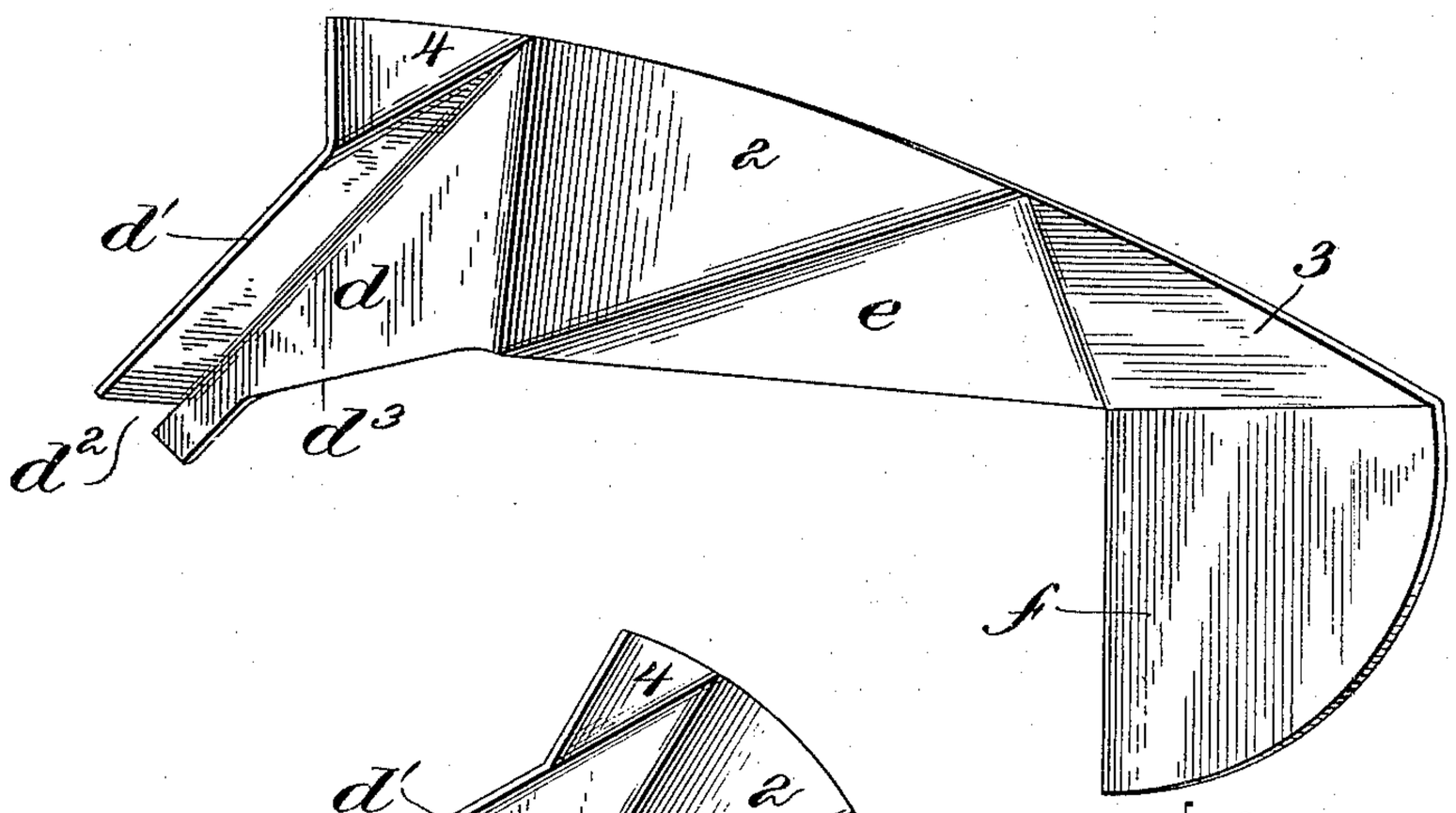

Fig. 3.

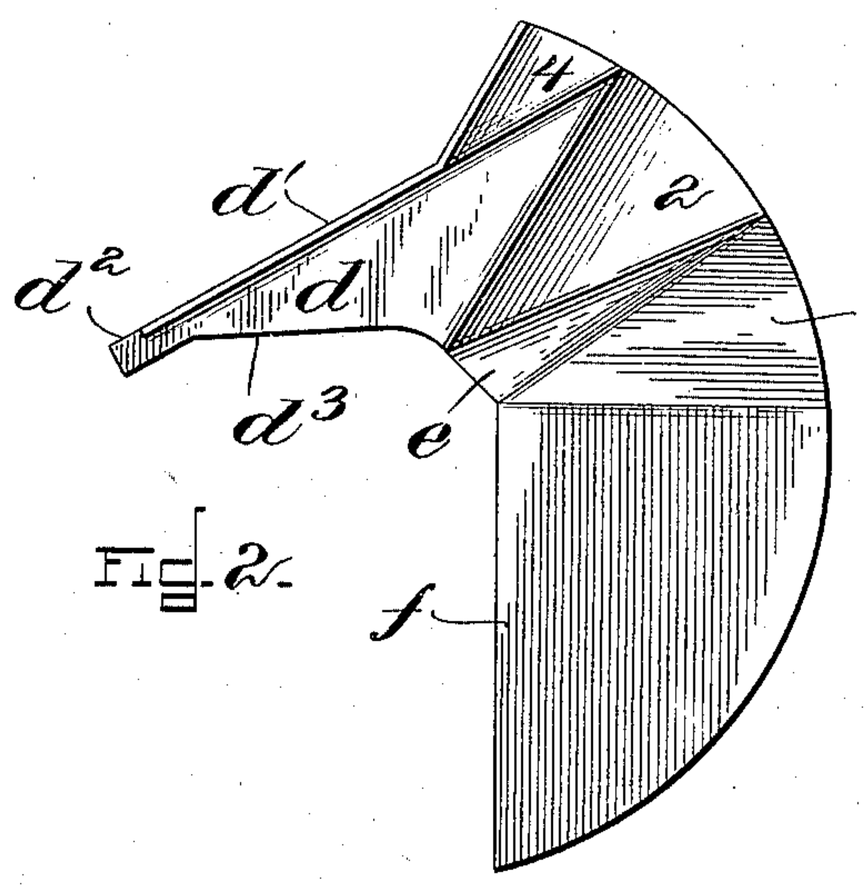

Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES W. HINMAN, OF BOSTON, MASSACHUSETTS.

GAS-METER.

SPECIFICATION forming part of Letters Patent No. 638,457, dated December 5, 1899.

Application filed June 19, 1896. Serial No. 596,120. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HINMAN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Gas-Meters, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention relates to gas-station meters of that class commonly known as "wet" meters, and has for its object to improve the construction of the same, to the end that the capacity of the meter is very materially augmented. Heretofore in meters of this class—as, for example, see United States Letters Patent to Lloyd, No. 175,865, dated April 11, 1876—a drum having several gas-receiving pockets with suitable openings is contained in a stationary case which is partially filled with water, the water entering said drum and occupying therein substantially the same level as in the case, and said drum is adapted to revolve on a horizontal axis, thereby turning in the water up to the water-line and causing its gas-receiving pockets to successively rise above the water-line, and at one end of said drum a chamber is provided or formed over all which contains a "dry well," which terminates just above the water-line, and the gas enters said chamber above the water-line through said dry well, and communicating passages are established between said dry-well chamber and said gas-receiving pockets, whereby the gas is free to pass continuously from said chamber into said pockets as they rise successively above the water-line, and said pockets have suitable exits whereby the gas is free to pass therefrom into said stationary case as said pockets successively fall below the water-line. The inlet and outlet of each pocket are so arranged relatively to each other that the former falls below the water-line before the latter rises above it. In said meter the gas-receiving pockets are arranged obliquely to the axis, and said drum is slowly revolved by reason of the gas entering the several pockets successively under pressure and impinging upon the oblique side walls of said pockets.

I find in practice that the usual dry-well chamber may be greatly reduced in size without in any way decreasing the capacity or efficiency of the meter; and my invention consists in reducing the cubic capacity of the dry-well chamber and correspondingly increasing the cubic capacity of the gas-receiving pockets—as, for instance, by letting a large portion of this dry-well chamber into the gas-receiving pockets to thereby present auxiliary compartments which open into and form coöperative parts or extensions thereof. The increased cubic capacity of the gas-receiving pockets materially augments the measuring capacity of the meter.

The invention also consists in otherwise increasing the cubic capacity of said gas-receiving pockets—viz., by bending the longitudinal side walls or division-walls of said pockets in such a manner that the transversely-disposed ends of each division-wall are brought into an approximately right-angular position with relation to each other, and by so bending said side walls or otherwise forming them to produce the result specified the end pieces or end walls of all said pockets at each end of the drum may be brought into practically the same plane instead of being arranged so as to overlap one another, and thus occupy considerable space, as heretofore, and consequently I am able to lengthen said pockets, carrying them flush with the ends of the drum and close to the end-walls of the stationary case; and the invention also consists in so shaping and arranging the side walls of the gas-receiving pockets that the opening for the escape of the water is greatly increased, and in consequence the water is permitted or caused to escape more quickly than heretofore, and in such case the gas may enter and fill the pockets in less time.

The invention also consists in so shaping and arranging the gas-receiving pockets that they will each present a larger cubic capacity above the water-line as they appear or rise above said water-line than heretofore.

Figure 1 shows a longitudinal vertical section of the measuring-drum of a gas-station meter embodying my improvements; Fig. 2, an end view of one of the division-walls; Fig. 3, a perspective view of the division-wall shown in Fig. 2; Fig. 4, a right-hand end view of the drum of the meter, showing particularly the dry-well chamber and passages com-

munication with the gas-receiving pockets; and Fig. 5, a transverse section taken on the line 5 5 of Fig. 1 looking toward the left.

The drum *a*, which contains the features of this invention, is adapted to be contained within a stationary case, (not shown,) which is partially filled with water, and said drum is mounted upon a shaft, as usual, to be supported by and to be revolved freely in said case, and it has at one end a head a^2. At one end of the drum *a* a dry-well chamber *b* is formed, which is adapted to receive any usual dry well, and division-walls are arranged in said drum to form gas-receiving pockets *c c c c*, which extend lengthwise the drum and obliquely or spirally to its axis. The dry-well chamber *b* at the end of the drum *a* has heretofore extended over or been made to cover the entire end of the drum, the head a^2 forming the outer side wall of said chamber, and it has also been made quite deep, and I have materially reduced the size of this dry-well chamber, taking a large portion of it from around its circumference and letting it into the several gas-receiving pockets, and the portions so taken from said dry-well chamber constitute auxiliary compartments or extensions *c'* on or for said pockets, which by being in open communication therewith form a coöperative part thereof. These auxiliary compartments or extensions are herein shown as formed by providing a triangularly-shaped end wall *d* for each pocket of smaller area than heretofore and which covers but a portion only of the end of the pocket, thereby leaving an opening by which the auxiliary compartment or extension *c'* to be formed is in open communication with the pocket, and then placing a wall *d'* at right angles to said end wall *d*, which projects from the outer edge of said wall *d* to the hood a^2 on the drum, and said wall *d'* when so disposed forms one side wall of the said auxiliary compartment or extension *c'*, the hood a^2 forming the end wall thereof, while the cylindrical shell of the drum *a* forms the other side wall. The gas-receiving pockets are thus provided at one end with auxiliary compartments or extensions *c'*, which surround the dry-well chamber *b*, and said pockets extend the entire length of the drum, and hence their cubic capacity is greatly increased. The dry-well chamber is correspondingly decreased, for it will be seen that the several end walls *d* taken together form the inner wall of said chamber, and the several walls *d'* form the side walls of said chamber, and the central portion of the hood a^2 forms the outer wall of said chamber. The triangular plates *d* are disposed in substantially the same plane, and they have narrow extensions at one end which are laid upon and secured to the adjacent triangular plates *d*, thereby enhancing the rigidity of the structure. The side walls *d'* of said auxiliary compartments or extensions *c'*, which are connected at their opposite longitudinal side edges to the end walls *d* of the pockets and to the hood a^2, occupy a position on a chord with the drum, and as there are several of such side walls *d'* (in this instance four) arranged at equal and regular distances apart around the axis of the drum they will form a square, so that the dry-well chamber in this instance is square; but said side walls *d'* are terminated a short distance from each other, so as to leave an opening d^2, which serves as an inlet-port, whereby the gas contained in the dry-well chamber is allowed to pass freely into the auxiliary compartments and thence into the gas-receiving pockets. The opposite ends of these side walls *d'* are bent over angularly, as shown at 4, thereby enlarging said openings or inlet-ports d^2.

The longitudinal side walls *e* of the gas-receiving pockets *c* extend from the end walls or pieces *d* at the dry-well-chamber end of the drum to the opposite end thereof, and said longitudinal side walls *e* are each bent angularly, as at 2 3, or may be otherwise formed so that the surfaces 2 3 at the opposite ends thereof lie in planes approximately at right angles to each other, or nearly so, and at oblique angles to the portions *e*. At the rearmost or outlet end of the drum, opposite the dry-well chamber *b*, an end wall or end piece *f* is connected to the portion 3 of each longitudinal side wall *e*, and said end pieces *f* are caused by reason of such bending or shaping of the side walls *e* to project or extend in a direction transversely with relation to or at right angles to the end pieces *d*, as shown in Figs. 2 and 3, and said end pieces *f* constitute the rearmost end walls of the gas-receiving pockets *c*, the spaces intermediate the said end pieces *f* constituting the outlet-ports for the pockets. Said end pieces or walls *f* of all the pockets *c* lie in the same plane and in a plane which is parallel with the end walls *d* at the opposite end of the drum.

By bending the radially-disposed longitudinal side walls *e* of the gas-receiving pockets as herein shown or in any equivalent way whereby the ends thereof are brought into a position at right angles or transversely with relation to each other the outer edge of the said walls *e* may be arranged spirally around the axis of the drum and the innermost edges of said walls substantially parallel to each other and also substantially parallel to the axis of the drum, so that the longitudinal opening of each pocket *e* formed by said separated side walls and used for the escape of the water occupies a position substantially in parallelism with said axis, and as the drum revolves the said opening or water-exit will rise in such a manner that the water may more quickly escape than heretofore wherein said longitudinal opening has been arranged very oblique or spirally to the axis. Moreover, I am enabled to present the different surfaces 2 and 3 and the intervening triangular portion *e* of each wall at an

oblique angle to the direction of the flow of gas through the pockets, and thereby cause the gas which is under pressure to so impinge upon the said angularly-disposed surfaces of the walls as to cause the drum to be revolved, thus bringing the several pockets successively above the water-line of the meter, and the gas which passes thereinto is discharged at the outlet end of the drum upon the subsequent immersion of each pocket as it is carried below the water-line. Also by so bending the longitudinal side walls *e* the rearmost end walls *f* of the pockets *c* may occupy the same plane instead of overlapping one another, as heretofore, and at the same time so separated as to leave intermediate spaces or ports, and as a consequence they may be located nearer the end of the drum than heretofore, being substantially flush with the end of the drum, and as a result the size or cubic capacity of the pockets is also largely increased, so that, taken in connection with the auxiliary compartments or extensions *c'*, the measuring capacity of the drum is greatly increased. The end walls *d* of the gas-receiving pockets are also cut away, as at d^3, to provide an auxiliary inlet-port for the gas, which will be used as the pocket rises out of the water by the revolution of the drum.

I have herein referred to the end walls lying in the same plane; but although said end walls may be arranged on the surface of a cone they will still lie in the same plane so far as this invention is concerned.

For the purpose of properly supporting the drum within its inclosing case a shaft *g* is provided, which extends centrally through the drum *a* and has secured thereon the spiders or frames *g'*, the arms of which are secured in any suitable manner to the end walls *d* and *f*, and the said shaft *g* is loosely journaled in the inclosing and supporting case of the meter and is free to revolve therein.

I claim—

1. In a gas-meter, a revolving drum having a dry-well chamber *b*, and several gas-receiving pockets in open communication therewith having auxiliary compartments at one end surrounding said dry-well chamber, substantially as described.

2. In a gas-meter, a revolving drum comprising a shell having a hood at one end, several gas-receiving pockets contained in said drum extending from end to end thereof, said hood forming a part of one end wall of each pocket and a dry-well chamber contained in said drum, the end wall of which is also formed by said hood, substantially as described.

3. In a gas-meter, a revolving drum, having several gas-receiving pockets and a dry-well chamber, a part of one end wall of each pocket and the end wall of said dry-well chamber occupying substantially the same plane, substantially as described.

4. In a gas-meter, a revolving drum having several gas-receiving pockets, each having an auxiliary compartment opening thereinto at one end, and a dry-well chamber the side walls *d'* of which also form the side walls of said auxiliary compartments, substantially as described.

5. In a gas-meter, a revolving drum having several gas-receiving pockets, each having an auxiliary compartment opening thereinto at one end, and a dry-well chamber the side walls *d'* of which form the side walls of said auxiliary compartments, and communicating passages d^2 between said dry-well chamber and said auxiliary compartments, substantially as described.

6. In a gas-meter, a revolving drum having several gas-receiving pockets extending from end to end thereof, and a dry-well chamber arranged centrally at one end of said drum, the inner wall and the side walls of which are formed by the end walls *d*, and side walls *d'* of said gas-receiving pockets, and communicating passages between said dry-well chamber and said pockets, substantially as described.

7. In a gas-meter, a revolving drum having several gas-receiving pockets, each having an end wall *d*, a longitudinal side wall *e*, bent at 2, 3, substantially as shown, and the end wall *f*, substantially as described.

8. In a gas-meter, a revolving drum having several gas-receiving pockets arranged obliquely to its axis, the oblique longitudinal division-walls of which are bent angularly, to bring the opposite ends of said walls into substantially transverse relation or at approximately right angles to each other, and the end pieces of which occupy parallel planes, substantially as described.

9. In a gas-meter, a revolving drum having several gas-receiving pockets arranged obliquely to its axis, the longitudinal walls of which are bent or formed to bring the opposite ends of said walls at an angle to each other, and the end pieces *d* of which, at the inlet of the drum, occupy substantially the same plane and are disposed to overlap one another and to be secured together, substantially as described.

10. In a gas-meter, a revolving drum having several gas-receiving pockets arranged obliquely to its axis, the longitudinal walls of which are bent or formed to bring the opposite ends of said walls at an angle to each other, and the end pieces *d* of which at the inlet end of the drum occupy substantially the same plane, substantially as described.

11. In a gas-meter, a revolving drum having several gas-receiving pockets extending lengthwise the drum with partitions which intersect any plane perpendicular to the axis in lines more or less oblique to its axis, each having an exit for the water of substantially equal width from end to end, substantially as described.

12. In a gas-meter, a revolving drum having several gas-receiving pockets extending lengthwise the drum with partitions which intersect any plane perpendicular to the axis

more or less obliquely to its axis, each having an exit for the water substantially parallel to said axis, and substantially the same width from end to end, substantially as described.

13. In a gas-meter, a revolving drum having several gas-receiving pockets extending lengthwise the drum with partitions which intersect any plane perpendicular to the axis more or less obliquely to its axis, the inner edges of the longitudinal side walls of said pockets lying substantially in parallelism with the axis of the drum, thereby presenting a large exit for the water, substantially the entire length of the pocket and of substantially the same width from end to end, substantially as described.

14. In a gas-meter, a revolving drum having several gas-receiving pockets arranged more or less obliquely to the axis of the drum and having their end walls at the exit of the drum wholly in the same plane, substantially as described.

15. In a gas-meter, a revolving drum having several division-walls extending lengthwise thereof more or less obliquely to its axis, each bent to bring its ends into transverse relation or at approximately right angles to each other, substantially as described.

16. In a gas-meter, a revolving drum having several oblique gas-receiving pockets with end pieces lying wholly in the same plane, substantially as described.

17. In a gas-meter, a revolving drum having several oblique gas-receiving pockets, each having an opening of substantially equal width from end to end, and also having inlet and outlet ports at right angles to said opening and oblique to the axis, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES W. HINMAN.

Witnesses:
B. J. NOYES,
HARRY O. ROBINSON.