No. 638,458. Patented Dec. 5, 1899.

C. W. HINMAN.

GAS METER.

(Application filed June 25, 1896.)

(Model.)

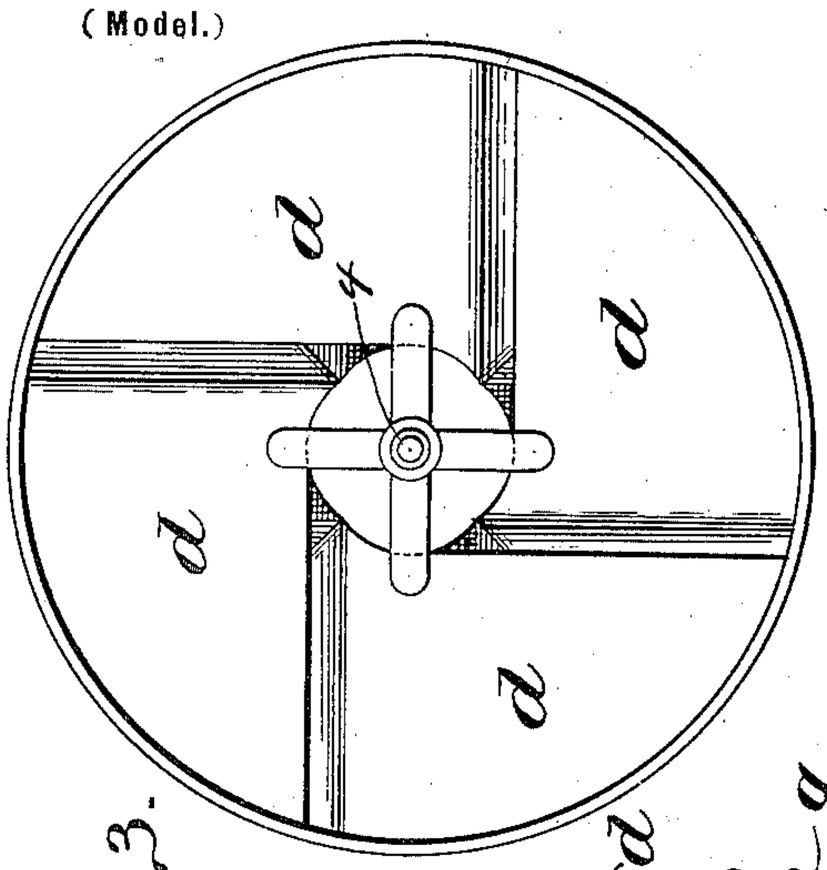

Fig. 3.

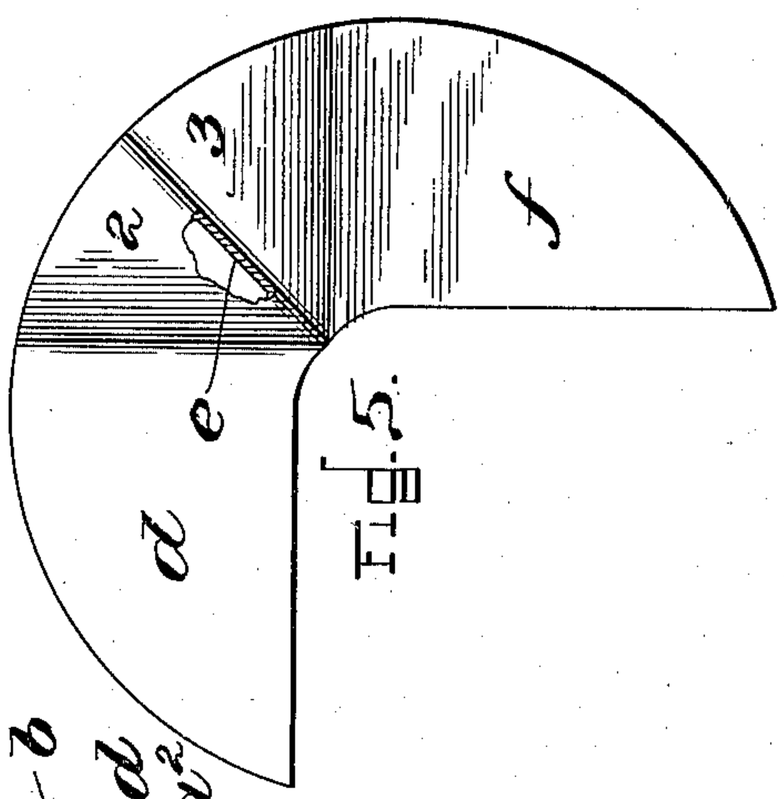

Fig. 5.

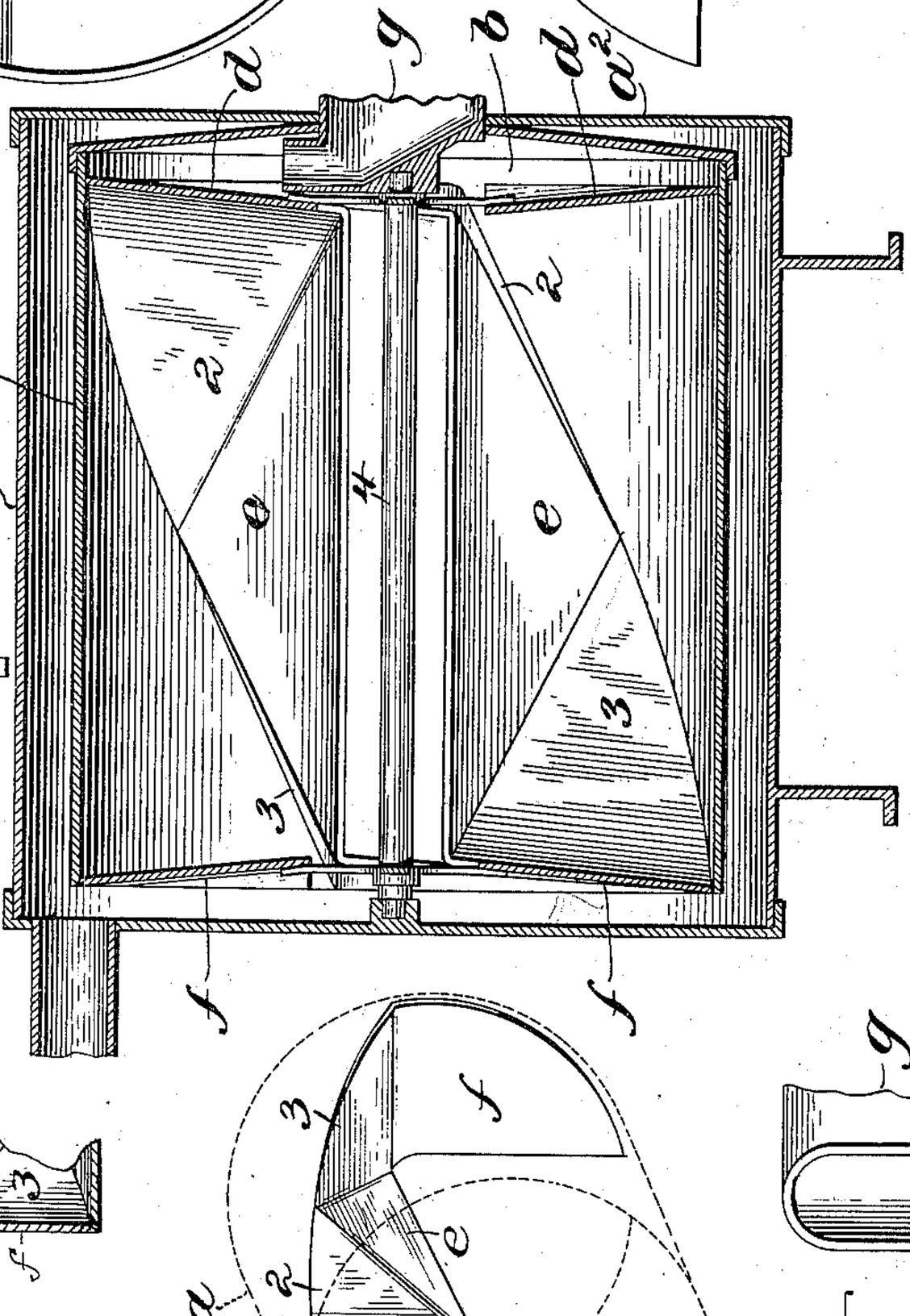

Fig. 1.

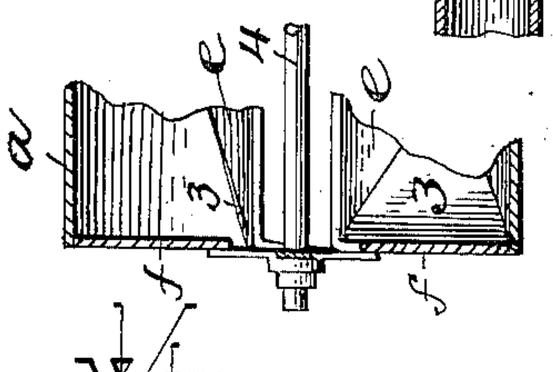

Fig. 6.

Fig. 2.

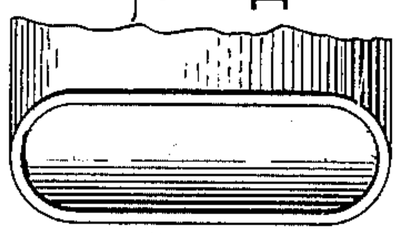

Fig. 4.

Witnesses.

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CHARLES W. HINMAN, OF BOSTON, MASSACHUSETTS.

GAS-METER.

SPECIFICATION forming part of Letters Patent No. 638,458, dated December 5, 1899.

Application filed June 25, 1896. Serial No. 596,877. (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 figures 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 said pockets under pressure and impinging upon the oblique side wall of the pocket, and as it thus revolves the gas enters the several pockets successively as the water passes out.

In another application, Serial No. 596,120, filed June 19, 1896, the longitudinal side walls of the gas-receiving pockets are bent or so formed that the opposite ends thereof are brought into a position approximately at right angles to each other, and by so doing the end walls of the several pockets may occupy the same plane at each end of the drum instead of overlapping one another, as has heretofore been common, and by reason of so arranging the end walls of the pockets they may be located nearer to the end of the drum than heretofore, and thus the cubic capacity of the pockets may be increased by increasing their length. In said application a large portion of the dry-well chamber was let into the gas-receiving pockets by forming auxiliary compartments or extensions in open communication with said pockets; but while such construction enables me to greatly increase the capacity of the meter, it is particularly applicable in remodeling old meters.

This invention has for its object to improve and simplify the construction of the meter shown in said application, at the same time not only retaining, but slightly augmenting, its materially-increased capacity.

In carrying out this invention the longitudinal side walls of the oblique gas-receiving pockets are bent or formed in such a manner that the opposite ends thereof will occupy a position at right angles to each other or thereabout, and the end walls of the pockets are made alike, or substantially so, and project at substantially right angles from the ends of said side walls and also at right angles to each other, and the end walls of all the pockets at each end of the drum may be disposed so as to occupy the same plane, and thus not only may the end walls at the rear end of the drum be brought nearer to the end thereof, but also the end walls at the front end of the drum may be brought nearer to the end thereof, thereby increasing the cubic capacity of the pockets by increasing their length at both ends. With the oblique gas-receiving pockets formed of longitudinal side walls bent or formed in this way and having like end walls arranged in parallel planes the inlet and outlet ports of each pocket will lie in substantially the same plane at opposite ends of the drum and transversely with relation to the axis of the drum, and said ports will occupy

a position more or less tangential to the center opening of the drum, and the longitudinal opening of each pocket, which serves as the exit for the water as the drum revolves, may be made to extend from end to end of the oblique pockets in parallelism with the axis of the drum, more nearly so than in said application.

I find that the cubic capacity of the usual dry-well chamber has been excessive and that it may be very largely reduced without in any way decreasing the capacity or efficiency of the meter, and hence, with the front end walls of the gas-receiving pockets lying in the same plane and the inlet-ports extending more or less tangentially to the axis of the drum, that I may very materially reduce the size of this dry-well chamber by making it very much thinner than heretofore and then flattening the dry-well or gas-inlet pipe accordingly, and by so reducing the depth of this chamber the length of the pockets may be still further increased as the end walls are brought nearer to the end of the drum.

Figure 1 shows in longitudinal vertical section a gas-station meter embodying this invention; Fig. 2, a perspective view of one of the longitudinal division-walls, with the end pieces which when contained in the shell of the drum form the gas-receiving pockets; Fig. 3, an end view of the drum; Fig. 4, a detail of the dry-well or gas-inlet pipe; Fig. 5, an end view of one of the longitudinal division-walls; Fig. 6, a longitudinal vertical section of a portion of the drum, showing the end walls of the gas-receiving pockets in plane surfaces.

The drum *a* is adapted to be contained within a case 1, partially filled with water, and to be mounted upon a shaft 4, as usual, to revolve freely in said case. Contained in said drum *a* are several division-walls *e*, having end pieces *d f*, disposed to form gas-receiving pockets, extending lengthwise of the drum and arranged obliquely to its axis. Herein four such division-walls with end pieces are shown, they being made alike, or substantially so. Each division-wall *e* extends lengthwise of the drum and the outer side or edge of said wall, at the opposite ends thereof, is bent in opposite ways, as shown, so that the opposite end portions 2 and 3 of said wall lie at right angles to each other, or substantially so, and obliquely with relation to the intermediate portion of the wall *e*. The end pieces *d* and *f* at the end of each wall *e* are made alike, or substantially so, and project therefrom at right angles to the wall *e*, and as the opposite end portions 2 and 3 of said wall *e* are disposed at right angles to each other said end pieces *d* and *f* will also project at right angles to each other, and they occupy parallel planes. These several division-walls *e*, with end pieces *d* and *f*, are arranged within the drum at equal and regular distances apart, and thereby form the gas-receiving pockets or compartments. Owing to the bends given to the said walls *e*, or any equivalent formation which may be given to them, whereby the opposite end portions thereof will occupy positions at right angles to each other, said pockets will be disposed obliquely to the axis of the drum and all the end pieces *d* at one end of the drum will occupy the same plane, and all the inlet-ports at said end of the drum will be at right angles to each other and substantially tengential to the center opening of the drum, and all the end pieces *f* at the opposite end of the drum will likewise occupy the same plane, and all the outlet-ports at said end of the drum will be also at right angles to each other and substantially tangential to the center opening of the drum, and the outlet-port of each pocket will lie in the same plane with the inlet-port of said pocket, or substantially so.

The dry-well chamber *b* is made very thin—*i. e.*, the space between the end walls *d* of the gas-receiving pockets and the hood a^2 of the drum is very narrow, said space being reduced to the minimum to enable the end pieces *d* to be brought as near as possible to the hood a^2 of the drum, and thereby increase the capacity of the pockets by materially lengthening them.

The dry-well or gas-inlet pipe *g* is flattened so as to be received within the thin or narrow space provided for it.

The longitudinal opening of each pocket through which the water escapes as the drum revolves extends from end to end of the pocket, and as the pockets are lengthened by moving the end walls *d* and *f* nearer to the ends of the drum said water exit openings will be very much larger than heretofore, and hence the water can more quickly escape, and owing to the bend or equivalent formation given to the longitudinal walls *e* by bending or otherwise manipulating the outer sides or edges thereof the inner edges of said walls will remain straight and will lie parallel to each other and also parallel to the axis of the drum, or substantially so, and more nearly so than in the application referred to, and as a consequence the openings for the passage of the water are parallel to the axis of the drum, and the water will begin to pass out of said openings as the drum revolves for the entire length. The formation of the walls *e* also serves to present the outer edge of each of said walls obliquely to or spirally around the axis of the drum, while the inner edge thereof will lie parallel, and as a result the different angularly-disposed surfaces of the wall *e* are presented obliquely with relation to the flow of the gas through the pocket, and the gas will impinge upon said surfaces and operate to revolve the drum.

I have herein referred to the end walls lying in the same plane; but in some cases said end walls will be arranged to present a cone-shaped surface.

In the meter herein shown the gas capacity per revolution is increased very materially as compared with the ordinary types on the

market, and by disposing the water-exit in parallelism with the axis of the drum the speed of the drum is also very materially increased, so that with a low gas-pressure the drum will be revolved very much faster than heretofore.

I claim—

1. In a gas-meter, a revolving drum having several longitudinal division-walls bent or formed with their opposite end portions at right angles to each other and oblique to the intermediate portion thereof, and having end walls projecting from said right-angularly-disposed end portions, substantially as described.

2. In a gas-meter, a revolving drum having several gas-receiving pockets arranged obliquely to its axis and having inlet and outlet ports arranged in substantially the same plane but at opposite ends of the drum, and having longitudinal openings for the escape of water arranged parallel to the axis of said drum, substantially as described.

3. In a gas-meter, a revolving drum having several longitudinal division-walls, each bent or formed with its opposite end portions at substantially right angles to each other, and oblique to the intermediate portion thereof, each wall having at the ends of its opposite end portions end pieces which project therefrom at an angle to the intermediate portion, substantially as described.

4. In a gas-meter, a revolving drum having several longitudinal division-walls, each bent angularly to bring its opposite end portions 2 and 3, at substantially right angles to each other, and having end pieces *d* and *f* at the ends of said opposite end portions, said end pieces located at the opposite ends of the drum at an angle to the longitudinal walls and forming end walls for the gas-receiving pockets, substantially as described.

5. In a gas-meter, a revolving drum having at one end a thin dry-well chamber formed between the end walls *d* of the gas-receiving pockets and the hood, and having several gas-receiving pockets extending lengthwise the drum more or less obliquely or spirally to its axis, the end walls *d* of all of said pockets adjoining the dry-well chamber occupying substantially a conical surface, substantially as described.

6. In a gas-meter, a revolving drum having several gas-receiving pockets comprising longitudinal walls bent to bring their opposite end portions at substantially right angles to each other and having end walls projecting from said end portions at an angle to the longitudinal walls, a hood, a thin dry-well chamber formed between the end walls of the gas-receiving pockets and the hood, and a flattened dry well contained in said thin dry-well chamber, substantially as described.

7. In a gas-meter, a revolving drum having several oblique gas-receiving pockets, each having a longitudinal opening for the escape of the water arranged substantially in parallelism with the axis of the drum, and also having inlet and outlet ports extending transversely the drum and at right angles to said longitudinal opening, substantially as described.

8. In a gas-meter, a revolving drum having a dry-well chamber at one end and several gas-receiving pockets comprising longitudinal walls bent angularly to bring their opposite end portions at substantially right angles to each other and end walls projecting from said end portions at an angle to the longitudinal walls, each pocket having a longitudinal opening from end to end for the escape of the water located in parallelism with the axis of the drum, substantially as described.

9. In a gas-meter, a revolving drum having a dry-well chamber at one end, and several gas-receiving pockets at the opposite end of the drum arranged obliquely to its axis having end walls which occupy a surface generated by a straight line intersecting the axis of the drum at a fixed point and at a constant angle, and rotated about said axis, and having inlet and outlet ports, and a longitudinal opening for the escape of the water located parallel to the axis of the drum extending from end to end of each pocket, substantially as described.

10. In a gas-meter, a revolving drum having a dry-well chamber at one end, and several gas-receiving pockets arranged obliquely to its axis having end walls at one end of the drum disposed substantially in a surface generated by a line intersecting the axis of the drum at a fixed point and at a constant angle and rotated about said axis, and having end walls at the opposite end of the drum also disposed substantially in a surface generated by a line intersecting the axis of the drum at a fixed point and at a constant angle and rotated about said axis, and each pocket having a longitudinal opening from end to end in parallelism with the axis of the drum, 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.