No. 756,366. PATENTED APR. 5, 1904.

# R. J. HOFFMAN.

## METER.

APPLICATION FILED JULY 22, 1903.

NO MODEL.

Fig. 1.

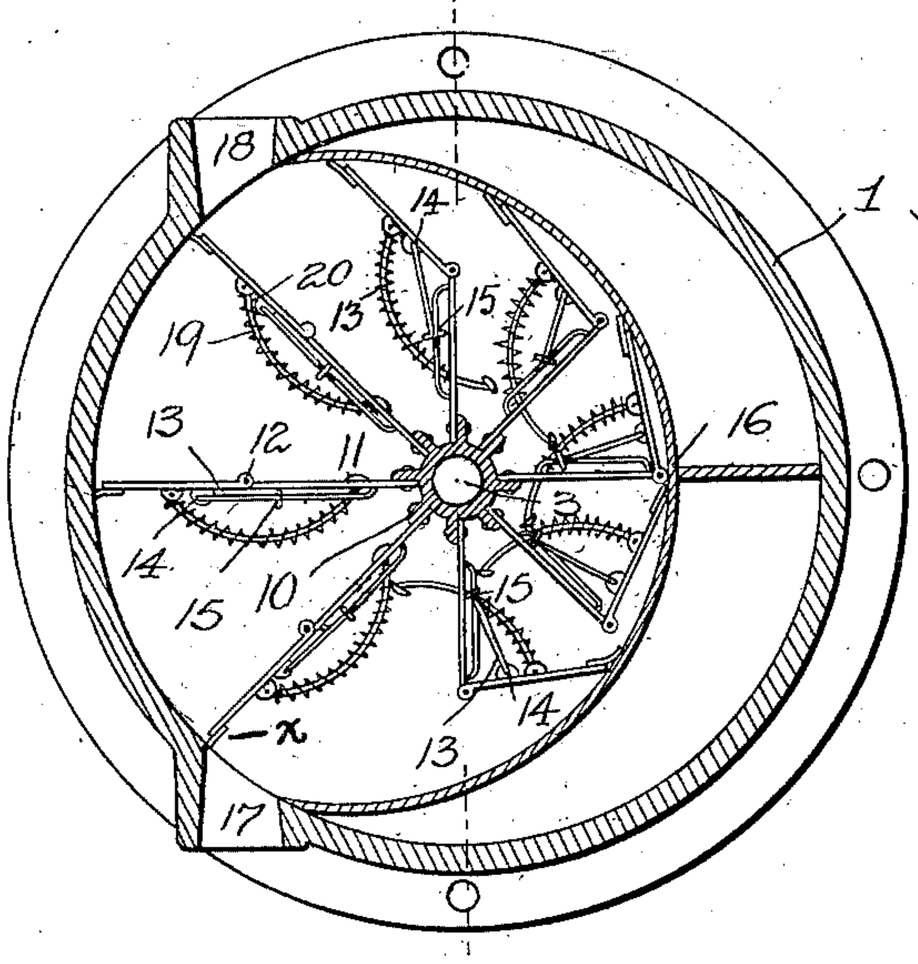



Fig. 3.

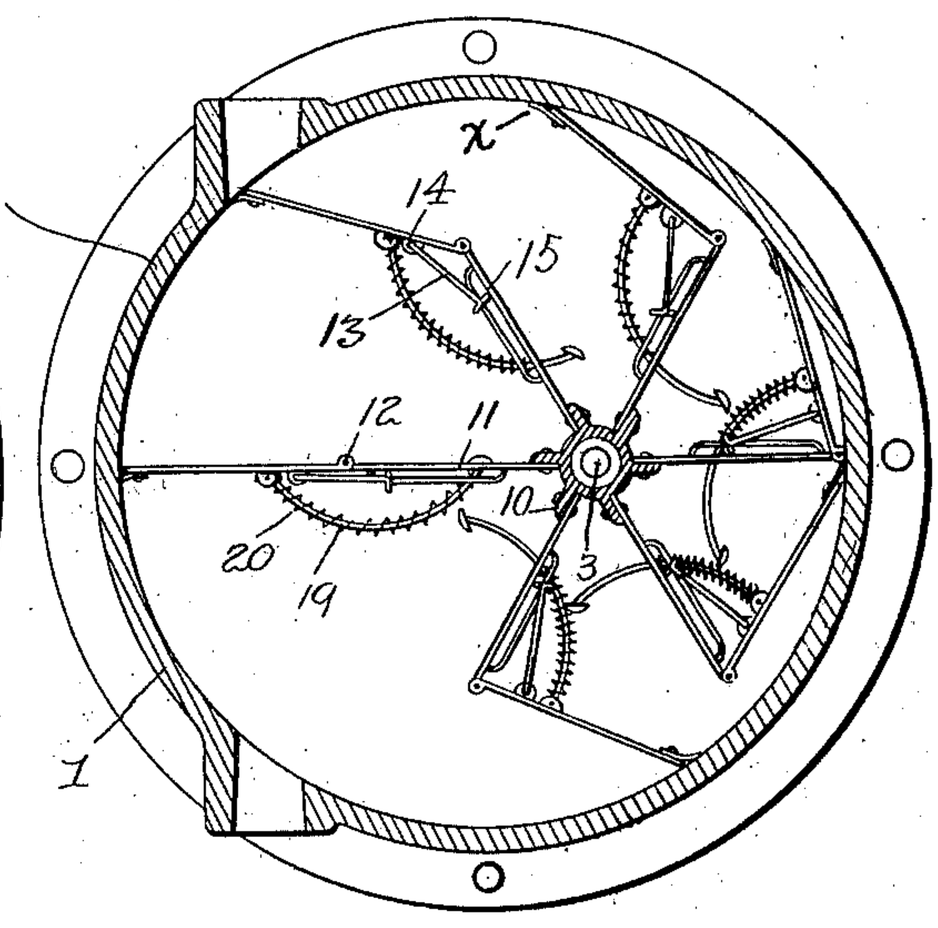
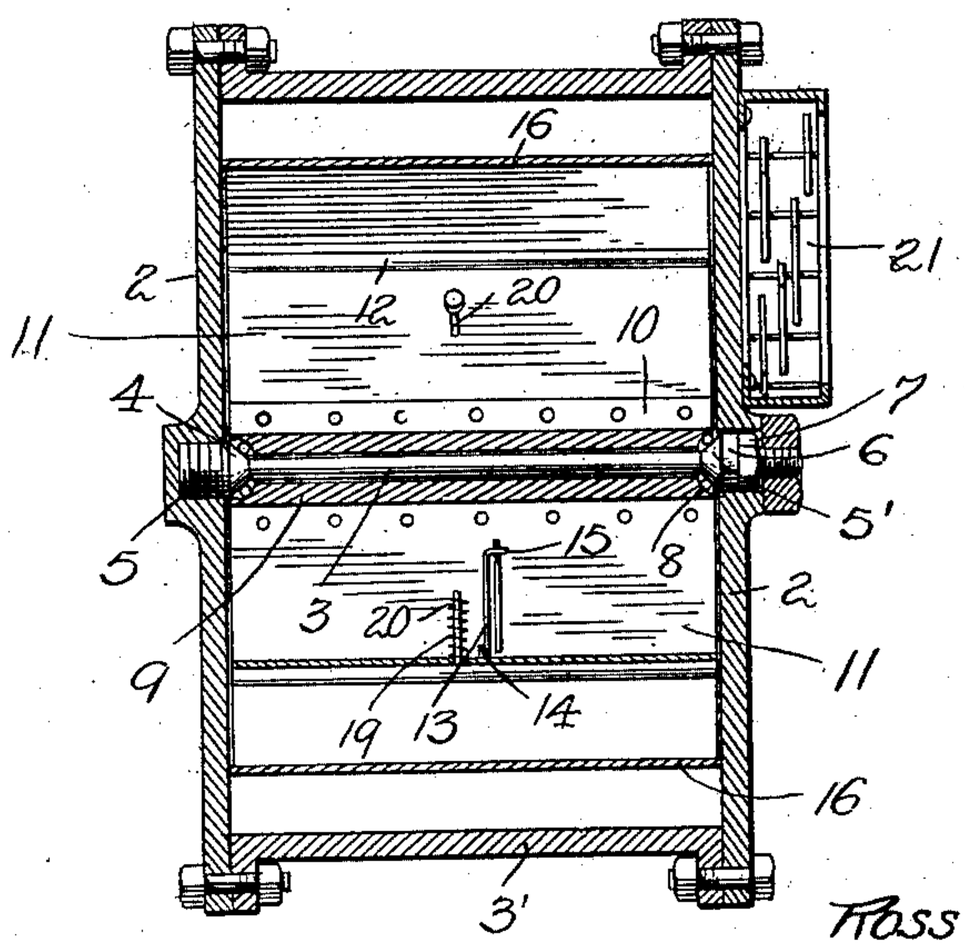



Fig. 2.




Attest:
C. M. Madeston
Edward Sartow

Inventor.
Ross J. Hoffman.
Ellis Spear & Company
Att'ys.

No. 756,366. Patented April 5, 1904.

# UNITED STATES PATENT OFFICE.

ROSS J. HOFFMAN, OF BRADFORD, PENNSYLVANIA.

## METER.

SPECIFICATION forming part of Letters Patent No. 756,366, dated April 5, 1904.

Application filed July 22, 1903. Serial No. 166,622. (No model.)

*To all whom it may concern:*

Be it known that I, ROSS J. HOFFMAN, a citizen of the United States, residing at Bradford, McKean county, Pennsylvania, have invented certain new and useful Improvements in Meters, of which the following is a specification.

My invention is an improvement in gas or like meters, and it is intended to measure the full volume of gas or fluid passing through the meter, all of said gas or fluid coming directly in contact with and acting upon the measuring-wheel.

The features of the invention are described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a central vertical sectional view through the apparatus. Fig. 2 is a sectional view at right angles to Fig. 1. Fig. 3 is a view of a modification.

In the drawings, 1 represents the casing of the apparatus, composed of side plates or heads 2 and a cylindrical portion 3′. A shaft or rod 3 extends across this casing centrally thereof, said rod being screw-threaded at 5 into one of the heads 2 and having ball-races 4 5′ thereon, the latter of which is formed by screwing a boss 6 on one end of the rod, where it is held by a jam-nut 7. Antifriction-balls 8 furnish bearings for a hub 9, forming part of the measuring-wheel, the said hub having radial arms 10, to which are bolted measuring-blades 11, which also extend radially from the hub, the said blades being formed in sections hinged together at 12, so that the outer section may have free pivotal movement on the inner section in one direction. The outer pivotal section or blade cannot, however, have movement about the hinge in the opposite direction, and for preventing this movement any suitable means may be provided. As one form of said means I show a link 13 hinged or pivoted to the outer blade-section at 14 and having a sliding connection at 15 with a part of the fixed blade. When the link is all the way out on its sliding connection, the outer blade then coincides with the rigid blade-section, forming a complete straight blade extending from the hub to the inner side of the casing. I provide a crown-sheet at 16 within the casing, which makes a path on its inner side for the hinged blades to work against, which path is eccentric to the center of the casing, as shown in Fig. 1, so that as the measuring-wheel turns the hinged blades working against this eccentric path will turn on their pivots into partly-folded condition, as shown in Fig. 1, whereas while the blades are traversing the opposite part of the casing—*i. e.*, that having its inner wall concentric with the center of the casing—the blades will be straight from end to end, because then the hinged sections will be coincident with the rigid sections.

The inlet for the gas or fluid to be measured is shown at 17 and the outlet at 18, and it will be noticed that these ports are in axial line with each other, but are arranged at one side of the center of the casing. The fluid passing from the inlet to the outlet will thus be directed against the straight blades and will turn the measuring-wheel in the direction of the arrow, the said fluid finding a greater area to work against upon the straight blade than upon the folded blade. The hinged sections of the blades are moved into their extended positions to form with the rigid sections a straight blade by means of springs 19, extending from the hinged section to the rigid section and guided or controlled by a curved bar 20, connected at its outer end to the pivoted section of the blade and passing loosely through the rigid section, so as to allow the same to move freely and compress the spring. The bar 20 is curved on an arc the center of which is the pivot of the blade.

In the operation of the meter the gas entering the port 17 will strike against the extended blade and turn the wheel and a certain volume of gas will be carried from the inlet to the outlet between two of the radially-extending blades. After passing the outlet each blade will begin to fold by its outer end moving against the surface of the crown-sheet, so that when the blade comes around to be acted on by the fluid-pressure it will present a diminished area as compared with the straight blade then being acted on by the said

pressure. Any suitable indicating mechanism may be connected with the measuring-wheel, and I have shown such a mechanism generally at 21 in Fig. 1.

In Fig. 3 I show a modification of the invention in which the measuring-wheel instead of being located at the center of the casing and having its folding blades controlled by a crown-sheet is located eccentrically of the casing, which is of cylindrical form. The operation here is substantially the same as that formerly described. The blades may be suitably packed, and as an example I have shown packing at *x*.

It will be noticed that my invention is distinguished from what are known as "proportional" meters, in that a full volume of gas acts on the measuring-wheel and not simply a small proportion of the said gas.

I claim as my invention—

1. In combination in a gas-meter, a casing, a measuring-wheel having blades composed of sections rigidly fixed to the wheel-hub and extending radially and other sections pivoted to the rigid sections, said casing having within it a portion eccentric to the center of the wheel for folding the said pivoted sections and means for causing the blades to assume an extended or straight condition, substantially as described.

2. In combination, a casing, a wheel therein having blades composed of sections rigidly fixed to the wheel-hub and extending radially and other sections pivoted to the rigid sections, means for stopping the folding sections of the blades against folding movement in one direction in relation to the fixed sections, the said blades being arranged to work upon a surface eccentric to the center of the wheel and a spring carried by each blade for making the same assume an extended or straight condition, substantially as described.

3. In combination, a casing, a wheel therein having folding blades, which are arranged to move over a portion of the casing eccentric to the center of the wheel, springs extending between the folding and rigid portions of the blades and a curved guide between said portions for controlling the springs, substantially as described.

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

ROSS J. HOFFMAN.

Witnesses:

EDWIN E. TAIT,

T. P. THOMPSON, Jr.