

No. 841,410.

C. A. LOCKWOOD. PATENTED JAN. 15, 1907.
ROTARY WATER METER.
APPLICATION FILED FEB. 15, 1906.

Fig. 1.

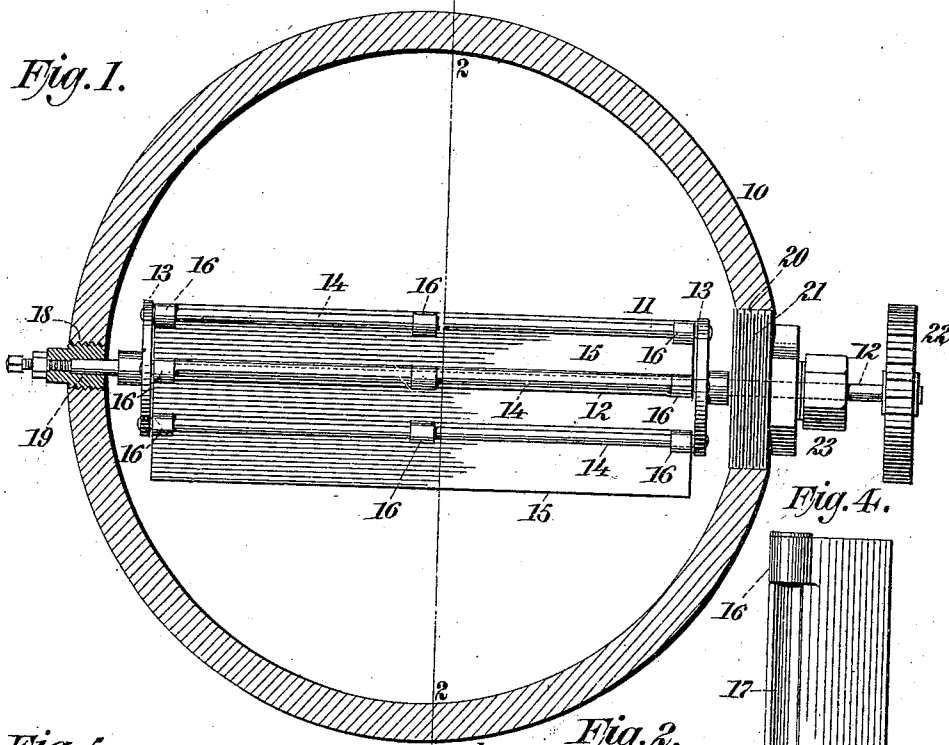


Fig. 4.

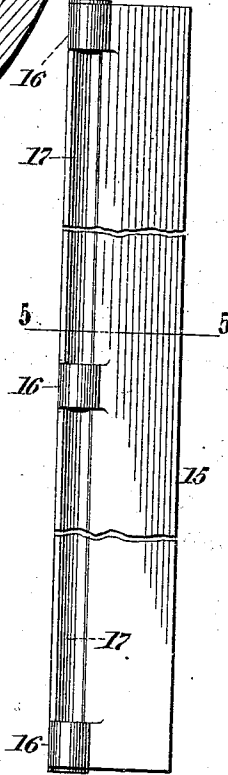


Fig. 2.

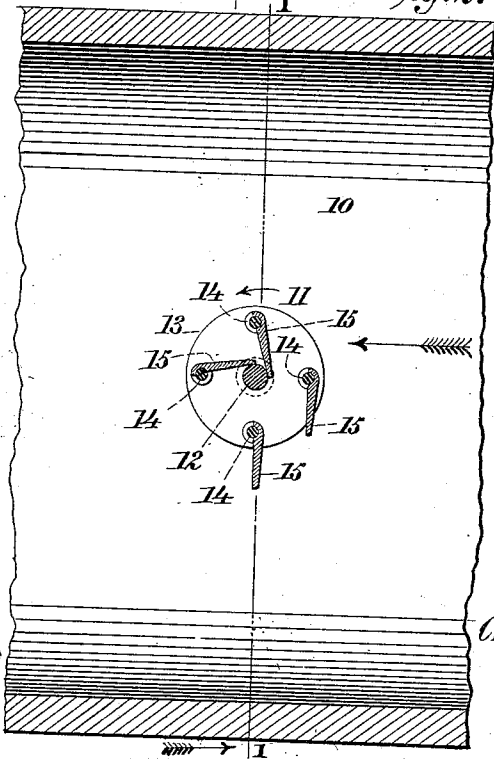


Fig. 5.

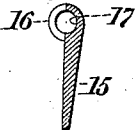
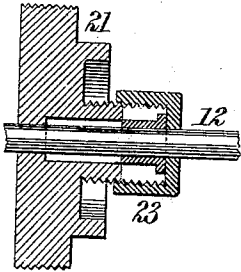


Fig. 3.



WITNESSES:

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CHARLES A. LOCKWOOD, OF NEW YORK, N. Y.

ROTARY WATER-METER.

No. 841,416.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed February 15, 1906. Serial No. 301,146.

To all whom it may concern:

Be it known that I, CHARLES A. LOCKWOOD, a citizen of the United States, and a resident of Jamaica, New York city, in the county and borough of Queens and State of New York, have invented certain new and useful Improvements in Rotary Water-Meters, of which the following is a specification.

The invention relates to improvements in rotary water-meters; and it consists in the novel features hereinafter described, and particularly pointed out in the claims.

The object of this invention is to provide efficient and inexpensive means for determining the number of gallons of water which may pass through a pipe within a given time, and in carrying out my invention I mount a specially-constructed wheel within a section of the pipe through which the water is to flow and utilize the rotary motion imparted to this wheel by the flowing water for setting in motion the mechanism of a registering device which will indicate the number of rotations said wheel may make within a specified time, and thus denote the number of gallons of water which passed through the pipe during the same period, it having been predetermined that the wheel will make a certain number of rotations during the passage by it of a fixed quantity of water within a given period through a pipe of specified diameter.

The wheel I prefer to mount within the pipe-section comprises a transverse shaft, disks rigid on the ends thereof, and a series of hinged blades mounted freely on equidistant rods secured to and extending between said disks, said blades being of such width that they may as they attain a vertical position at the upper side of the said shaft extend from their supporting-rod to said shaft and bear at their free edge against the latter, thereby affording a broad surface against which the flowing water may act to rotate the wheel, while the blade at the lower side of said shaft and that approaching the upper side thereof hang loosely from their rods and offer no appreciable resistance to the flow of the water.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical transverse section through a water-pipe section equipped with

a meter-wheel in accordance with my invention. Fig. 2 is a vertical longitudinal section of same on the dotted line 2 2 of Fig. 1. Fig. 3 is an enlarged detached vertical section through the bearing for one end of the shaft of the wheel. Fig. 4 is an enlarged detached face view of one of the blades of the wheel, and Fig. 5 is a transverse section of same on the dotted line 5 5 of Fig. 4.

In the drawings, 10 designates a portion of a section of pipe through which the water may flow, and 11 the wheel mounted therein and extending transversely across the same and adapted to be rotated by the passage of the water through the pipe.

The wheel 11 comprises a transverse shaft 12, disks or heads 13, rigid on the end portions of said shaft within the pipe, equidistant rods 14, secured at their ends in said disks or heads and extending between the same parallel with said shaft, and blades 15, freely hinged at one edge upon said rods and adapted to hang therefrom, said blades corresponding with one another and each being in width about equal to one-half of the diameter of the wheel. The blades are formed with sleeve or knuckle members 16 to pass freely upon the rods 14 and are concaved, as at 17, along the side of one edge to fit loosely around about one-half of the circumference of said rods.

The pipe 10 is provided at one side with a threaded aperture 18 to receive the screw-plug 19, which affords a bearing for one end of the shaft 12, and at its opposite side said pipe has a larger orifice 20 formed in it to receive the screw-plug 21, which affords a bearing for the other end of the shaft 12 and through and beyond which said shaft extends to receive a gear-wheel 22 or other device for transmitting motion to the registering mechanism. (Not shown, this application not being limited to any special register or indicator.) The bearing-plug 21 is provided with a suitable gland 23.

The orifice 20 is of such size that the assembled wheel 11 may be inserted and withdrawn through it, which is a feature of great convenience.

The wheel 11 being in position in a section of a pipe-line, with the water flowing against the same in the direction of the central arrow in Fig. 2, said wheel will rotate, and while rotating the blades 15 thereof will constantly in succession assume the positions in which they are represented at the upper side of the

shaft 12 in Fig. 2, said blades as they reach a vertical position at the top of the wheel bearing at their lower edge against the shaft and affording firm surfaces against which the water may effectively act, and then as the wheel rotates said blades successively leave such vertical position while during a little more than a one-quarter turn of the wheel remaining in contact with the shaft 12, as shown at the upper left-hand portion of the wheel in Fig. 2, and are then thrown outwardly by the flowing water to a position nearly parallel with the large arrow in Fig. 2, whence they are carried upwardly to a vertical position again at the top of the wheel, where they one after another receive the force of the flowing body of water and insure the rotation of the wheel. The wheel 11 thus at one side only offers a resisting-surface to the moving body of water, the blades at the other side of the wheel merely hanging idly and swinging on the rods 14 under the force of the water without offering appreciable resistance to the same.

Fig. 2 does not show the water flowing through the pipe-section 10, and hence therein the blades 15 at the lower and right-hand sides of the wheel are represented as hanging downwardly. The wheel as a whole may be designated as a "skeleton" wheel, as distinguished from a drum carrying blades on its periphery.

The wheel 11 is, except in respect of its shaft, entirely free of the walls of the pipe 10, the disks 13 and blades 15 being so proportioned as not to touch said walls during the rotation of the wheel and to permit the blades to turn freely downwardly as they reach the lower side of the wheel. Although the wheel is when in use, in effect, suspended in the middle of a flowing body of water completely filling the pipe 10, said wheel will, due to its movable blades and the fact that they become effective only when reaching a position at one definite side of the shaft, be kept in constant rotation in the same direction.

The rotations of the wheel 11 may be registered or counted by any suitable mechanism provided for that purpose and actuated from the shaft 12, and thereby it may be indicated how many gallons of water have passed through the pipe 10 within a given period, it having been predetermined that the wheel will make a certain number of rotations during the passage by it of a fixed quantity of water within a specified time through a pipe of given diameter.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A rotary water-meter for measuring the quantity of water flowing through a pipe during any period of time, comprising a skeleton wheel mounted within said pipe and having its shaft projected through the side thereof,

and means on the exposed end of said shaft for transmitting motion to a registering device, said wheel having a series of hinged blades which become effective as resisting members as their free ends successively turn inwardly and downwardly at the upper side of said shaft and hang freely, so as to swing in the direction of the flowing water, at the lower side of said shaft; substantially as set forth.

2. A rotary water-meter for measuring the quantity of water flowing through a pipe during any period of time, comprising a wheel mounted within said pipe and having its shaft projected through the side thereof, and means on the exposed end of said shaft for transmitting motion to a registering device, said wheel having a series of blades which become effective as resisting members as they successively reach one definite side of said shaft and hang freely at the other side of said shaft, and said pipe having at one side an orifice and a plug therein affording a bearing for one end of said shaft and at the other side an orifice and a plug therein affording a bearing for the other end of said shaft, the latter orifice being of sufficient size to admit the assembled wheel through it; substantially as set forth.

3. A rotary water-meter for measuring the quantity of water flowing through a pipe during any period of time, comprising a skeleton wheel mounted within the pipe-line and in the path of the flowing water and having on one end of its shaft means for transmitting motion to a registering device, said wheel comprising heads on said shaft and a series of blades hinged at their outer edges to said heads and each being in width about equal to one-half the diameter of the wheel, and said blades and pipe being proportioned to permit said blades to become effective resisting members as their free ends successively turn inwardly and downwardly at the upper side of said shaft and hang freely so as to swing in the direction of the flowing water, at the lower side of said shaft; substantially as set forth.

4. A rotary water-meter for measuring the quantity of water flowing through a pipe during any period of time, comprising a skeleton wheel mounted within the pipe-line and in the path of the flowing water and having on one end of its shaft means for transmitting motion to a registering device; said wheel comprising heads on said shaft, a series of rods secured at their ends to said heads, and a series of blades having at their outer edge the knuckle members and concave recess to pass on said rods and thereby become freely hinged thereto and each being in width about equal to one-half the diameter of the wheel, and said blades and pipe being proportioned to permit said blades to become effective resisting members as their free ends succes-

sively turn inwardly and downwardly at the upper side of said shaft and hang freely so as to swing in the direction of the flowing water, at the lower side of said shaft; substantially
5 as set forth.

5. A rotary water-meter for measuring the quantity of water flowing through a pipe during any period of time, comprising a wheel mounted within said pipe and having its
10 shaft projected through the side thereof, and means on the exposed end of said shaft for transmitting motion to a registering device, said wheel having a series of blades which become effective as resisting members as they
15 successively reach one definite side of said

shaft and hang freely at the other side of said shaft, and said pipe having at one side a bearing for one end of said shaft and at the other side an orifice and a plug therein affording a bearing for the other end of said shaft, said
20 orifice being of sufficient size to admit the assembled wheel through it; substantially as set forth.

Signed at New York city, in the county of New York and State of New York, this 14th
25 day of February, A. D. 1906.

CHARLES A. LOCKWOOD.

Witnesses:

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ARTHUR MARION.