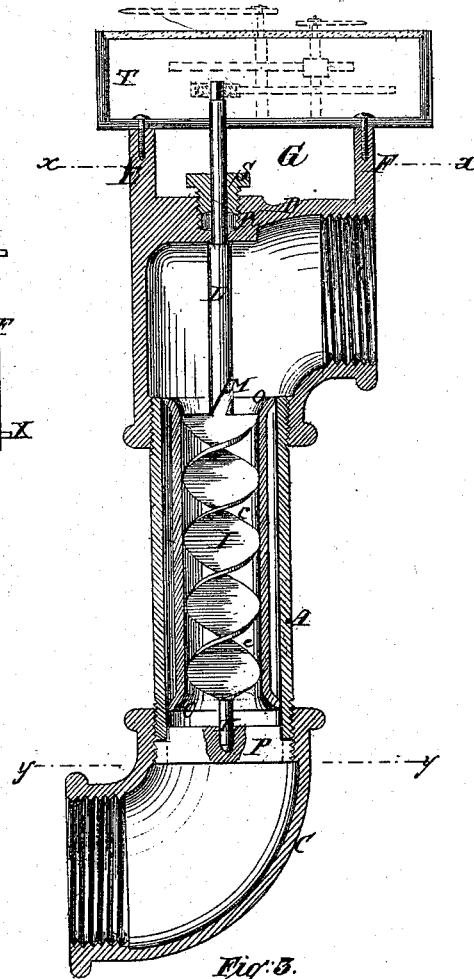


J. W. GROAT.  
WATER METER.

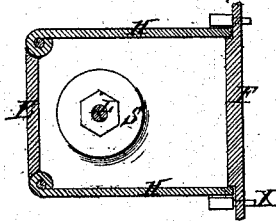
No. 107,900.

Patented Oct. 4, 1870.

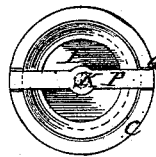
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses:*

*C. Raettig.*  
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*Inventor:*

*J. W. Groat*  
*mmf*

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# United States Patent Office.

JOHN WARNER GROAT, OF NEW YORK, N. Y.

Letters Patent No. 107,900, dated October 4, 1870.

## IMPROVEMENT IN WATER-METERS.

The Schedule referred to in these Letters Patent and making part of the same

### *To all whom it may concern:*

Be it known that I, JOHN WARNER GROAT, of the city, county, and State of New York, have invented a new and useful Improvement in Water-Meters; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

My invention relates to water-meters, and consists in certain improvements which will be first described and then clearly pointed out in the claim.

The invention consists in the construction of the case and the blade, and in the relative arrangement of the one with the other; also, in the construction of the tube inclosing the spiral blade.

Figure 1 is a sectional elevation of my improved meter;

Figure 2 is a horizontal section on the line *x x* of fig. 1; and

Figure 3 is a section on the line *y y*.

Similar letters of reference indicate corresponding parts.

A is a short section of iron, or other tubing, such as is used for conducting water in buildings. It is bored out true and smooth, and is to be introduced between sections of the water-pipe, preferably in a vertical position, by a union or an elbow, C, and the elbow D.

This latter elbow is cast with the flanges E F rising up from it parallel with the part A of the case, fronting each other so as to form two sides of a chamber, G, the other two sides of which I prefer to make of doors H, hinged to either of the said two flanges.

I is the screw, which I propose to make by twisting a thin flat plate of metal, and attaching the shafts K L for the end supports, said flat plate forming the required spiral with the least amount of metal, and without the central shaft or core commonly used, thereby offering the least amount of resistance to or displacement of the water, which I suppose will pass over the said screw in a solid column divided only by the thin plate.

The shafts, which are thicker than the plate of which the screw is formed, may have grooves, M, to admit the water to pass onto and leave the plate in the most unobstructed manner.

I arrange this screw in a short section of tube N, just large enough to admit it, and connect the two together, and this tube, which is smaller than the tube A, is provided with the flaring ends O, swelled outward to the size of the internal diameter of the pipe A, and the said ends are brought to a thin edge, so as to offer the least resistance to the water, which is guided by the walls of the said ends into the space through which the screw passes.

The end of the shaft K rests in a step or bearing in a cross-bar, P, which is of the same length as the external diameter of the screw-threaded end of A, and it is provided with screw-threads corresponding with the threads of the said tube A, so that the ends being let into radial slots Q, in A, the said cross-bar will be retained in place when the elbow or union C is screwed on.

The shaft L is passed through a hole, R, in the back of D, between the flanges E F, and in line with the axis of A, around which hole is a stuffing-box, S, for packing the said shaft.

This shaft extends above or beyond the flanges E F into a case, T, attached to the said flanges for containing the registering gear, which may be of any kind, and which is shown in the drawing in dotted lines.

The doors H, opening into the chamber G, afford convenient access to the stuffing-box for tightening it, as may be required from time to time, and they provide a means of locking up the stuffing-box to prevent access to it by persons not authorized, who might screw it down so hard as to prevent the spiral blade from running at the proper rate of speed.

For locking the said doors, I prefer to use soft metal pins, X, which may be flattened on the ends, after passing through the holes, by pincers or other means, making impressions of a peculiar character, which cannot be restored by others not having the instruments, so that unauthorized persons opening the doors to tamper with the stuffing-box would be detected.

It will be seen that this construction is very simple and cheap, and the meter made thereby is small and compact, and adapted for the most ready attachment to the water-pipes.

It may be placed either end up, or horizontally, as may be preferred, but it will work best in a vertical position.

The edges of the tube N, being shaped as shown, prevent the lodgment of dirt or other matter on the end against which the water flows, which would occur if the ends were thick and flat; they also prevent the passage of the same between the tubes A and N.

The said edges are intended to fit so snugly with the walls of A as to prevent the escape of water thereat.

Having thus described my invention,

I claim as new and desire to secure by Letters Patent—

1. The elbow D, forming part of the case of the water-meter, provided with the chamber G around the stuffing-box, the said chamber being formed by the flanges E F, the doors H, and a case, T, for containing the registering apparatus, substantially as specified.

2. The cross-bar P, fitted in the slots in the end of the tube A, provided with the screw-threads, and secured by the elbow or union screwing on the said part A, all substantially as specified.

3. The combination, with the spiral plate I and the tube A, of the tube N, provided with the flaring

ends O, reduced to thin edges and fitted to the said tube A, all substantially as specified.

JOHN WARNER GROAT.

Witnesses:

GEO. W. MABEE,

T. B. MOSHER.