

A. GUTHRIE & W. GUTHRIE.

Water and Gas Meter.

No. 126,951.

Patented May 21, 1872.

Fig. 1.

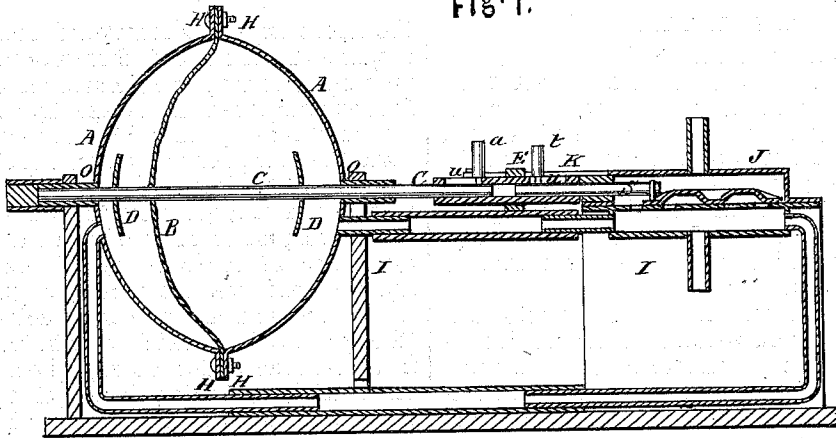
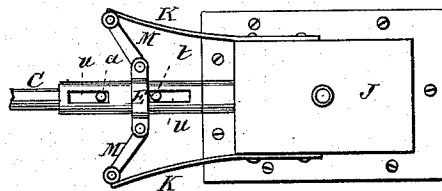


Fig. 2.



Witnesses.

Pat. Agent
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UNITED STATES PATENT OFFICE.

ALFRED GUTHRIE AND WARDELL GUTHRIE, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN WATER AND GAS METERS.

Specification forming part of Letters Patent No. 126,951, dated May 21, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that we, ALFRED GUTHRIE and WARDELL GUTHRIE, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Meter for Water or Gas; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The nature of our invention consists in a suitable measuring-vessel or meter divided into two divisions or chambers by a flexible septum of India rubber, leather, or other flexible material, being so formed as to conform to the shape of the interior surfaces of the vessel, and which will offer no resistance on being carried by the impelling force of the entering liquid or gas from one side to the other of the vessel, thus performing the function of a piston. It will be readily understood that water or gas entering on one side will press toward the other opposite side, thereby expelling that contained in the opposite chamber, which may be conducted through suitable pipes and valves arranged for the inflow and discharge, alternately. It will be plain that the pressing liquid or gas will be distributed over every portion of the surface of the septum, and that this will be met by a corresponding resistance equally distributed over the surface by the liquid or gas in the opposite chamber, the septum merely floating along between the two divisions of the liquid or gas until it reaches its limit, and is spread out upon and in close contact with the interior surface of the meter, when (or instantly before the contact) the valve will be changed, and the septum in turn will be carried back to the other side. It will be evident that there will be no forces tending to rupture the septum; consequently a material of almost the finest texture will answer the purpose, and as all the liquid or gas must be expelled on one side, while it must be exactly filled on the other, it must afford the most accurate means of measurement; the variations of pressure (if any) making no change in the quantity of discharge at each transit of the septum. Again, water having very little if any compressibility or power of expansion, it remains dead and inert at the very instant when

the forces impelling it forward cease to operate, as at the instant of change of valve, when it is liable to stop and remain on the center. It is our purpose to afford exactly at this juncture another impelling force or forces to complete the change of the valve. Although it is the case that primarily we derive the power to actuate the movement of the valve from the entering liquid or gas, we have transferred it, by means of the pressure of the incoming liquid spread over the surface of the septum, while it was strong, to a more active agency, (the spring,) from which we can bring it into instantaneous action at any given point desired simply by forcing the knuckle-joint past the center line or radius earlier or later in the travel of the septum.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

Figure 1 shows the meter as partially cut open to exhibit the interior arrangement, A A being two half spheres, bolted together by the center rim H H, between which the septum is firmly clamped. B shows the septum, carried partially over to one side, the direction of the currents indicated by the arrows. C shows a rod passing through from side to side, and out through a stuffing-box at one side and into a covered case at the other. This rod pierces the septum, as will be seen, and is for the purpose of actuating the valve. D D shows two stops on the rod C, placed apart so as to allow the septum to make a portion of its travel from side to side before in any way moving the rod or the valve, it having been stiffened in the center, say, by thick rubber. When it reaches the stop it will be carried along to the wall of the meter at O, and virtually give movement to the valve. Projecting from the side of the meter is the frame-work I, for holding the four-way valve J and the two springs K K. The rod C passes into the hollow cross-head or pipe E, to which are attached the two pitmen or knuckle-joints M M, which at the other ends are connected to the springs K K by the means of the pin a, working in the slot or opening u. The knuckle-joints may be carried forward, spreading the springs more and more, until, passing the center line, they will buckle forward from the force of the bended springs, driving the cross-head against the pin t in the

slot *u* of the separate valve-rod *s*, entering the other end of the cross-head, forcing the valve over, and changing the direction of the inlet and discharge thus alternately back and forth.

We do not intend to confine ourselves strictly to this kind of knuckle-joint, for the same effect may be produced by the use of an arched spring, its ends resting upon the spring *K K*. The means of registering the revolutions, having been long in use, are so common that we simply make the attachment without any special reference to it.

Claims.

We claim—

1. The combination and arrangement of the septum *B*, the movable rod *C* having its fixed stops *D D*, the septum moving freely over the rod back and forth to the stops, when the rod

will be carried forward or backward (as the case may be) through the stuffing-box, moving the hollow cross-head *E*, when, by the operation of the attached knuckle-joints *M M*, the springs *K K* are spread apart, thereby acquiring power, which on their reacting will be given back, and, through the agency of the same knuckle-joints, will be transferred to actuate the valve.

2. We claim the combination and arrangement of the cross-head *E*, the knuckle-joints *M M* with the springs *K K* operating on the valve-stem *S* to operate the valve, substantially as set forth and described.

ALFRED GUTHRIE.

Witnesses: WARDELL GUTHRIE.

E. P. HARRIS,

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