2 Sheets--Sheet 1.

J. RADSTON.

Gas-Meter.

No. 160,031. Patented Feb. 23, 1875.

Fig. 1.

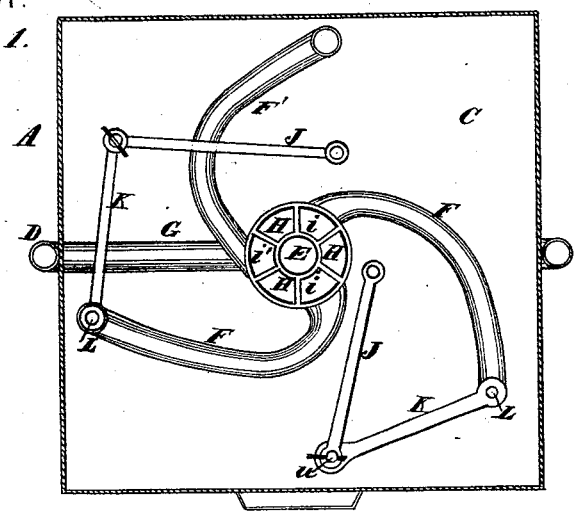


Fig. 2.

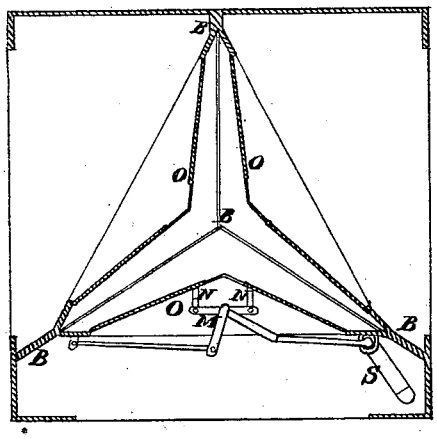


Fig. 3.

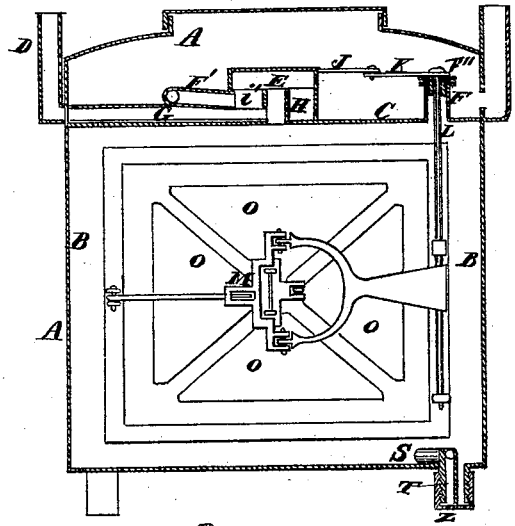
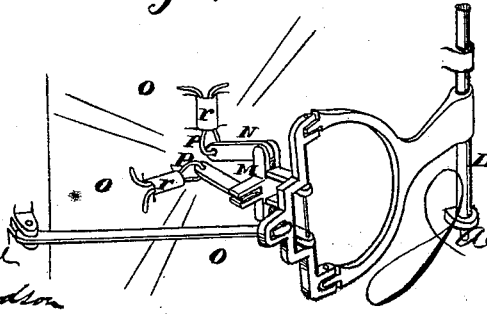


Fig. 4.



Witnesses

John L. Boone

C. M. Richardson

Inventor

Jacob Radston

by Dewey & Co

Attys

J. RADSTON.

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Fig. 5.

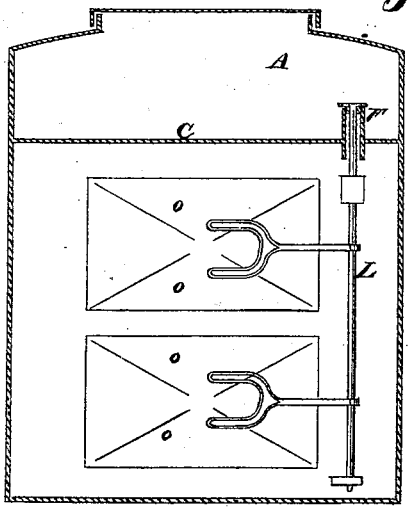


Fig. 6.

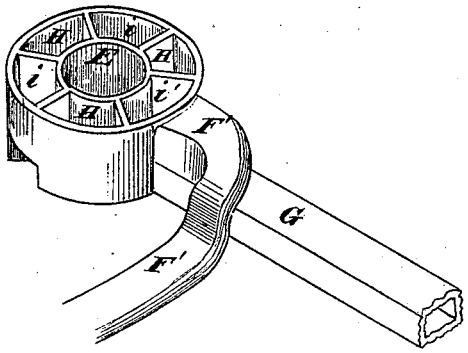


Fig. 7.

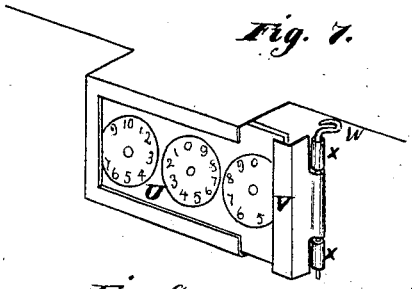


Fig. 8.

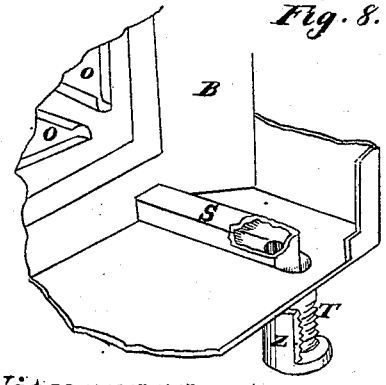
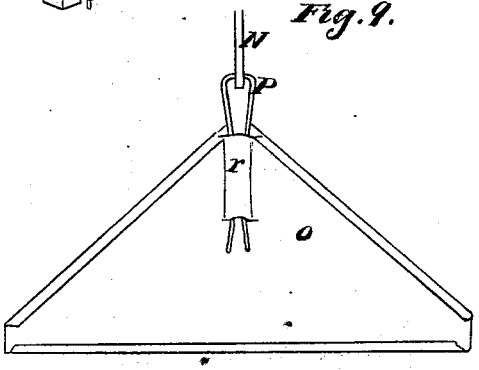


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

JACOB RADSTON, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN GAS-METERS.

Specification forming part of Letters Patent No. **160,031**, dated February 23, 1875; application filed July 10, 1874.

To all whom it may concern:

Be it known that I, JACOB RADSTON, of San Francisco city and county, State of California, have invented an Improved Gas-Meter; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to certain improvements in that class of gas-meters known as dry meters; and it consists, first, in passing the operating-rods up through the pipes instead of through separate stuffing-boxes, and in a novel device for connecting the diaphragms with the links of the operating-rods, so that the connections are easily renewed and the motion of the diaphragms made adjustable.

By means of suitable passages the interior and exterior chambers of any meter are so connected with a single discharge that any accumulation of liquid in either or both chambers can be at any time drawn off.

By means of a simple device I am enabled to renew the glass in front of the indicators at any time, and the whole apparatus of a three-diaphragm meter is fitted into a square outer case, which is much more convenient than a round or other shaped case.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1, Sheet 1, is a plan of the upper chamber. Fig. 2 is a transverse section through the diaphragms. Fig. 3 is a front view of one diaphragm with its gearage. Fig. 4 is a perspective view of the gearage. Fig. 5, Sheet 2, is a view showing double diaphragms. Fig. 6 shows the construction of the inlet-pipes and valve. Fig. 7 shows the manner of securing the glass face of the indicator. Figs. 8 and 9 are detailed views of parts of the device.

A is a square case, within which the three skeleton frames B for the diaphragms are fitted and secured, as shown. Above these is a horizontal floor or partition, C, which divides the three exterior and three interior chambers formed by the diaphragms from the valve-chamber above.

The first part of my invention consists in an improved method of constructing the inlet-pipes and connecting them with the valve. D is the pipe which brings the gas to the machine. In order to connect this pipe with the central valve E without interfering with the pipes F F F′, which connect the valve with the chambers exterior to the diaphragms, has been a source of considerable trouble, and has been accomplished in various ways, either by means of a double floor at C, or by making one of the partitions between the interior chambers double, and connecting the pipe D with this partition, the space being in either case then connected with the valve. Another method is to carry the pipe downward from the valve into one of the chambers; thence with two bends carrying it out to connect with the pipe D.

In my improved device I make my valve E of double the depth, and carry a pipe, G, directly from the pipe D to the valve, into the bottom of which it opens at the center. Around the central space are the usual openings H H H, which connect with the interior chambers of the diaphragms, while the alternate openings *i i i′* connect by means of the pipes F F F′ with the exterior chambers. The valve being of sufficient depth in my device, the opening *i′* is immediately above the pipe G, and the pipe F, is carried up over the pipe G to connect with this opening.

This construction is much cheaper and easier than any of the others.

The top or cover of the valve is rotated in the usual manner by the action of the connecting-rods J, lever-arms K, and vertical shaft L, each of which receives its motion from the diaphragm by means of a lever-arm and yoke.

In my machine I carry the shaft L up through the extensions F″ on the ends of the pipes F, as shown, and provide them with stuffing-boxes at the top to prevent leakage. This construction saves me the necessity of separate openings and stuffing-boxes.

The yokes M are connected, by links N, to the shields O of the diaphragms. These links

are attached, at their inner ends, to the loops P, which are formed of bent wires, and they are slipped through the sleeves or holders *r*. These holders are secured to the inner corners of the shields. The loops P are adjustable out or in, and by this means the movement of the diaphragms and their capacity are regulated.

The loops being secured by bending the ends back over the holders *r*, it is manifest that they can be easily adjusted and removed if worn out, while, if soldered on in the ordinary manner, they would have to be melted off with a hot iron at the risk of burning the leather of the diaphragm.

Fig. 2 shows the link connected by a removable pin; and other similar methods are sometimes available to render it adjustable.

Another source of trouble in meters is the accumulation of liquid, which not only rots the leather, but is very difficult of removal, as it is usually emptied through the gas-passages before described.

In my machine I employ a pipe or passage, S, which may be either upon the bottom or below it, and leads from the interior chamber to one corner of the machine, where it leads downward into the top T, occupying one half of this foot. The other half connects directly with the exterior chamber, as shown, and a screw-cap, Z, closes both passages. By removing this cap the liquid can, at any time, be withdrawn.

The glass front which protects the indicators U frequently becomes broken, and is very difficult to replace. In order to overcome this difficulty I fit two strips of metal at the top and bottom of the indicator-case, and between these the glass slides. One end of the glass is permanently closed, and the other has a strip of metal, V, bent as shown, and this strip slides in against the end of the glass to prevent its falling out. The strip V is kept in place by means of a rod or pin, which passes through two pintles, X, secured to the end of the case, and one formed upon the edge of the strip V, which lies between the other two. By removing this pin the strip V can easily be taken out and the end of the glass exposed.

The strip V may be secured by a bit of solder or other similar means, and by this device I can, at any time, replace the glass without removing the whole indicator-case.

The link J is connected with the lever K by being slipped over a vertical pin, *u*, upon the lever, and is secured by a wire through the pin, thus making it easy to remove the link at any time, or to replace it when worn out, without cutting into the outer case.

When large meters are to be made it is difficult to operate diaphragms of sufficient size, and nearly impossible to obtain material large enough to make them. I therefore employ two diaphragms on each side, one above the other, as shown in Fig. 5. The shaft L is then provided with two operating-levers and two sets of gearage, thus giving great capacity with no increase in the size of the diaphragms.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The pipes F F, provided with the extensions F″, the ends closed with stuffing-boxes, in combination with the internally-arranged shafts L and diaphragms O, for operating the valves, as set forth.

2. The loops P, adjustably secured in the holders *r*, in combination with the diaphragms O, links N, yokes M, and operating-levers, substantially as and for the purpose herein described.

3. The divided foot T, having one half connecting with the chamber exterior to the diaphragm, and the other half connected with the interior chamber by the pipe S, the foot being provided with a screw-cap, Z, the whole operating substantially as and for the purpose herein described.

In witness whereof I hereunto set my hand and seal.

JACOB RADSTON. [L. S.]

Witnesses:
JNO. L. BOONE,
C. M. RICHARDSON.