

J. E. Fisk,

Gas Meter,

No 21,663.

Patented Oct. 5, 1858.

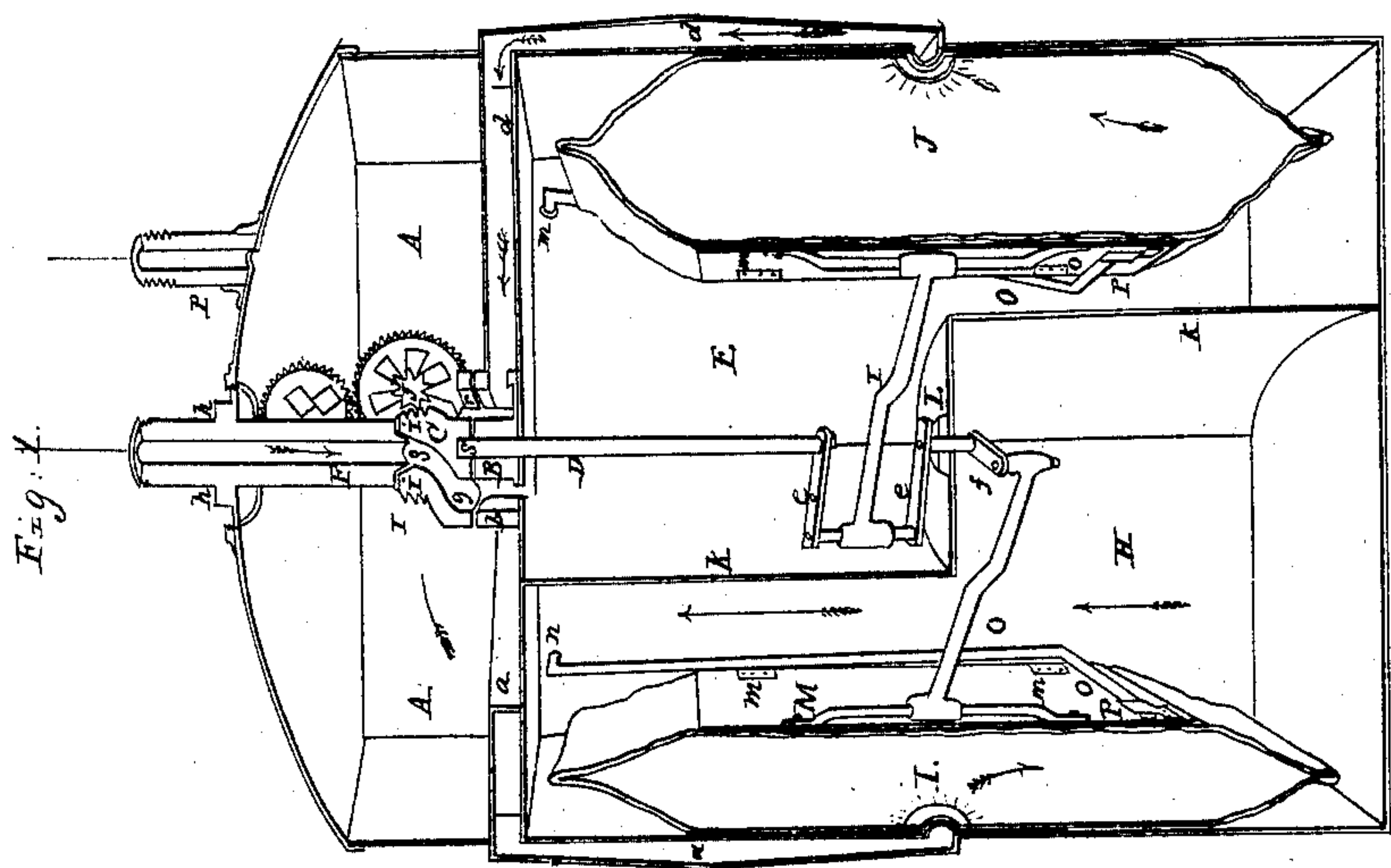


Fig. 6.

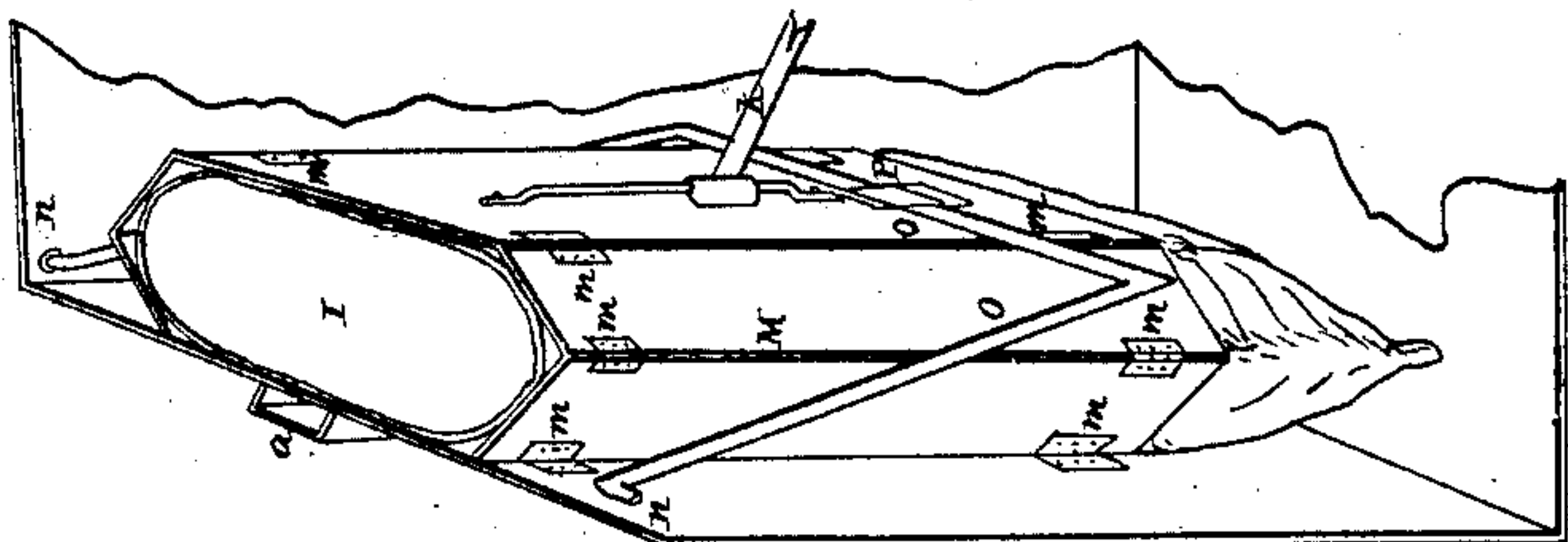


Fig. 2.

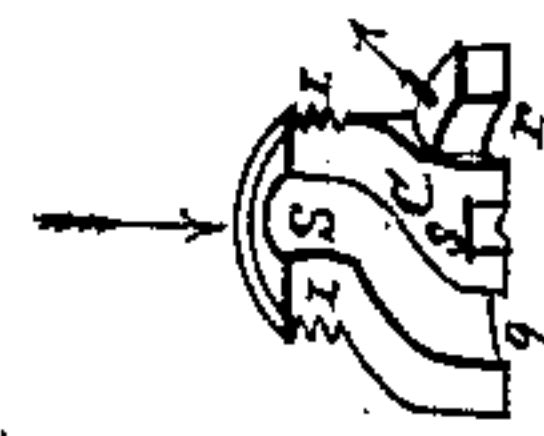
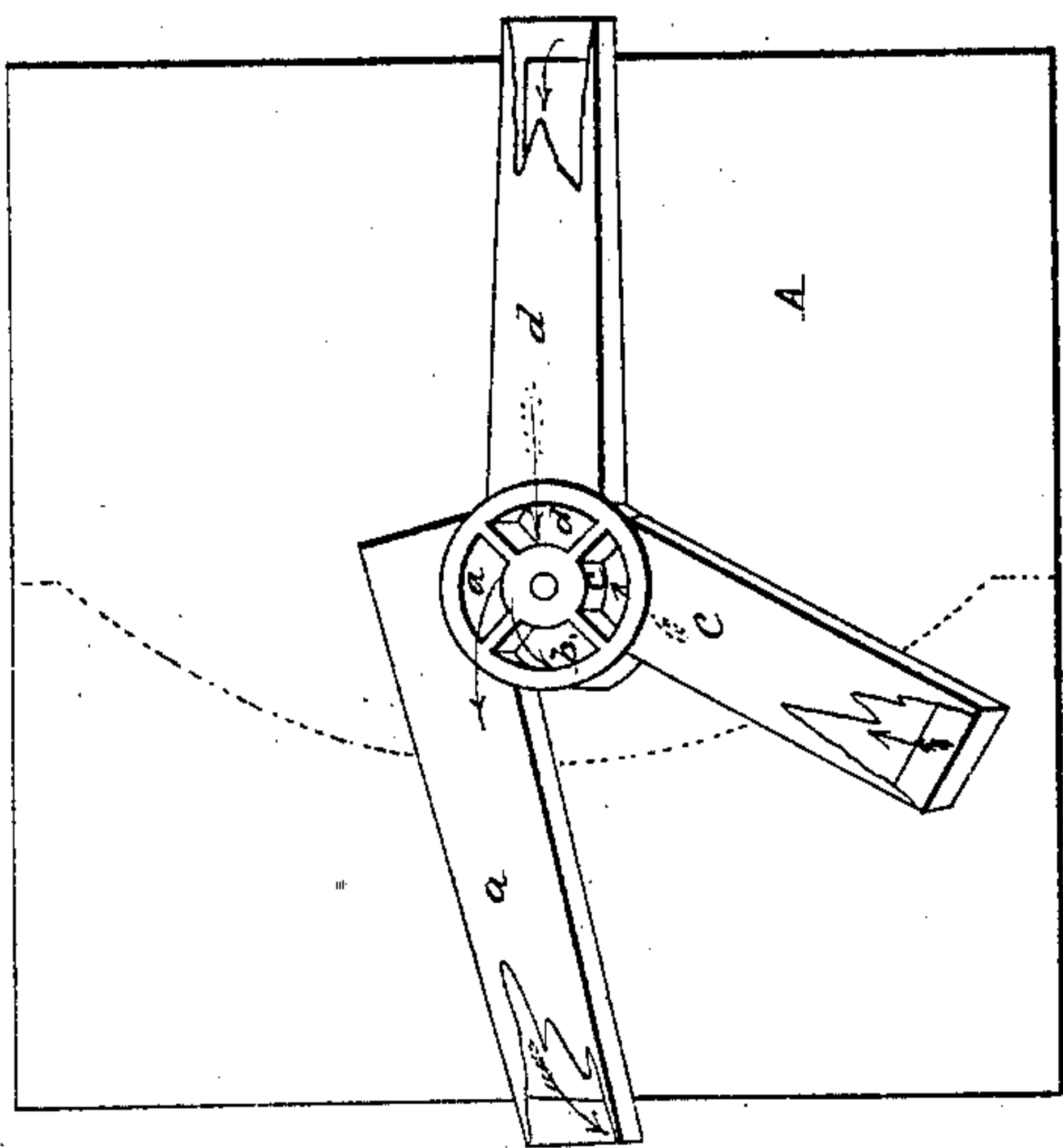


Fig. 3.

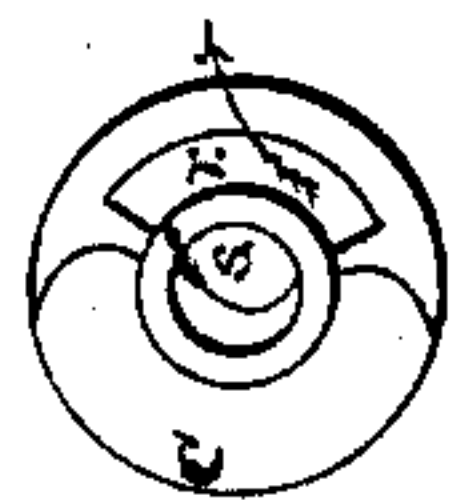


Fig. 4.

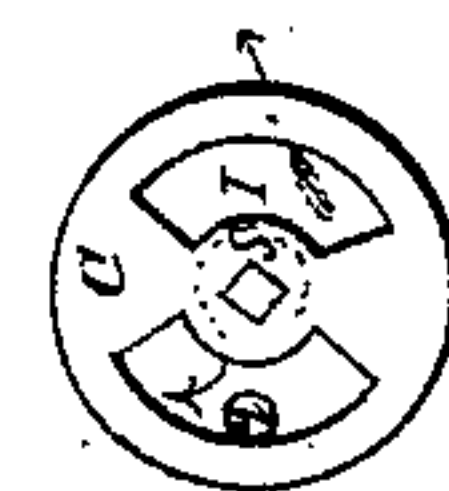


Fig. 5.

UNITED STATES PATENT OFFICE

J. E. FISK, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN GAS-METERS.

Specification forming part of Letters Patent No. 21,663, dated October 5, 1858.

To all whom it may concern:

Be it known that I, JOSEPH E. FISK, of Salem, in the county of Essex and State of Massachusetts, have invented an Improved Machine or Meter for Measuring Gas; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1 represents a vertical section of the said meter, showing most of its parts in their peculiar arrangement. Fig. 2 is a view of the floor of the upper chamber or reservoir, A, and shows the valve-seat with the position of the tubes connecting the chambers and sacks with the valve of the meter. Fig. 3 represents the lower face of the valve. Fig. 4 its upper face, and Fig. 5 a vertical section of the said valve. Fig. 6 is a view of an expanding case with its sack, guide-wire, &c.

In the said drawings, A denotes the upper gas chamber or reservoir; B, the valve-seat, and *a b c d* the tubes or passages connecting the valve-seat with the working parts of the meter. On the valve-seat B rests the valve C, secured by the square socket *s* to the crank-shaft D, which passes down through the valve-seat and into the chamber E, and through the partition K, and into the chamber H, it being connected with the cranks *e* and *f*, and the operative parts as will be hereinafter described.

Into the orifice G, in the upper face of the valve, is inserted the supply-pipe F, which may be taken out of the meter by means of the movable nut *h*, to which it is fastened, such being for the purpose of removing and cleaning the valve. On the upper part of the said valve is a screw or worm, *i*, which operates the pinion *j* of the register-train of gears G, which should be properly adjusted to record the number of cubic feet of gas passing through the meter.

E and H are the lower chambers of the meter, in which operate the flexible sacks I and J of the flexible cases M N.

K K represents the partition between the chambers, it being formed with two bends or niches, as shown in Fig. 1. On the horizontal part of the partition at L is a box, through which the crank-shaft should work air-tight.

e and *f* are the cranks, which are set at right angles with each other.

k and *l* are connecting-rods connecting the cranks with the flexible cases M and N. These cases (see Fig. 6) are each made of tin or metal plates hinged together at their edges, as denoted by the letter *m* in the drawings. They may be provided with the guide-wires O O, to regulate the form of the sacks and cause them to expand equally, while the cranks prevent their expansion beyond a given point, the same serving to secure uniformity in the amount of gas measured at each revolution. The guide-wires O O depend from the sides of the chambers as at *n*, and are carried across the faces of diaphragms at *o o*, where they are held in place by the starts *p p*. The pipe P connects the reservoir A with the burners.

With this combination of the several parts of the meter when the valve C is adjusted, as shown in Fig. 1, the gas on being let into the pipe F will flow in the direction of the arrows laid down in the drawings. Under such circumstances the orifice marked *q* in the valve opens into the passages *a* and *b* of the valve-seat. The gas flows through the tube *a* into the sack I and through the passage *b* into the chamber E. The pressure in the sack I and the chamber E expels the gas from the chamber H through the tube *c*, and from the sack J through the tube *d*, and the orifice *r* in the valve into the reservoir A. As the sack I distends and the sack J is compressed, a corresponding movement regulated by the guide-wires is made in the cases M N and the connections *k l*, which revolve the cranks, the same causing the valve C to be revolved upon the valve-seat. (See Figs. 2 and 4.) This revolution of the valve cuts off the gas first from the sack I, which is now full, letting it on the chamber H, then from the chamber E, letting it on the sack J, which is now empty, while the orifice *r* in the valve allows the pressure of the gas in the sack J and chamber H to expel the gas from the sack I and the chamber E, thus reversing the conditions indicated in Fig. No. 1. As the sack J distends and the sack I is compressed, the valve is still further revolved until the conditions of Fig. 1 are reproduced. The valve revolves steadily in one direction, always connecting a sack or chamber at each quarter-revolution, as it cuts off the one before; hence, the connection with the supply-

pipe remains unbroken and the current of gas is smooth and uniform.

With my arrangement of the operative parts I am enabled to bring the shaft D and the valve C in the middle of the meter, and thereby make one shaft answer for the two sacks, instead of having a separate shaft for each sack, as in other meters. Furthermore, I employ flexible sacks instead of bellows, and I inclose each sack within a metallic flexible encompassing-case. This enables me to easily renew the sacks in case either may become leaky or injured. I am not obliged to reject the solid parts, as is the case when bellows sacks are used. Furthermore, the arrangement and application of the tube F and the valve C and the case of the meter enable me to easily gain access to the valve whenever it may be necessary to clean it.

I do not claim the employment of two flexible bellows in two separate chambers. Nor do I claim the mode of constructing the flexible bellows as exhibited in the United States Patent No. 9,591, wherein each bellows is made of two metallic shallow dishes or partitions joined at their edges by a flexible connection. This differs essentially from my invention wherein a sack, I or J, separate from

and arranged within a flexible inclosing-case, M or N, is employed as in my invention, the sack alone constitutes the gas-receiving chamber, and can be readily removed from its flexible case whenever necessary without requiring the inclosing case to be removed from the meter.

What I do claim is—

1. The above-described improved arrangement of the partition K and the shaft D, the cranks, valve C, and valve-seat B, with respect to the chambers E, H, and A, and the pipes or passages *a b c d*, the same enabling one shaft D only necessary to the operation of the valve by the two sacks I and J.

2. Combining with each flexible sack I J a flexible inclosing-case, M or N, arranged so as to operate therewith, as specified.

3. The arrangement and application of the pipe F with respect to the valve C, and the case of the meter, the same being in manner and for the purpose as specified.

In testimony I have hereunto set my signature.

JOSEPH E. FISK.

Witnesses:

THOS. H. JOHNSON,
AUG. STORY.