R. Creuzbaur.

Piston Valve.

No. 88,371. Patented Mar. 30, 1869.

Fig. 1.

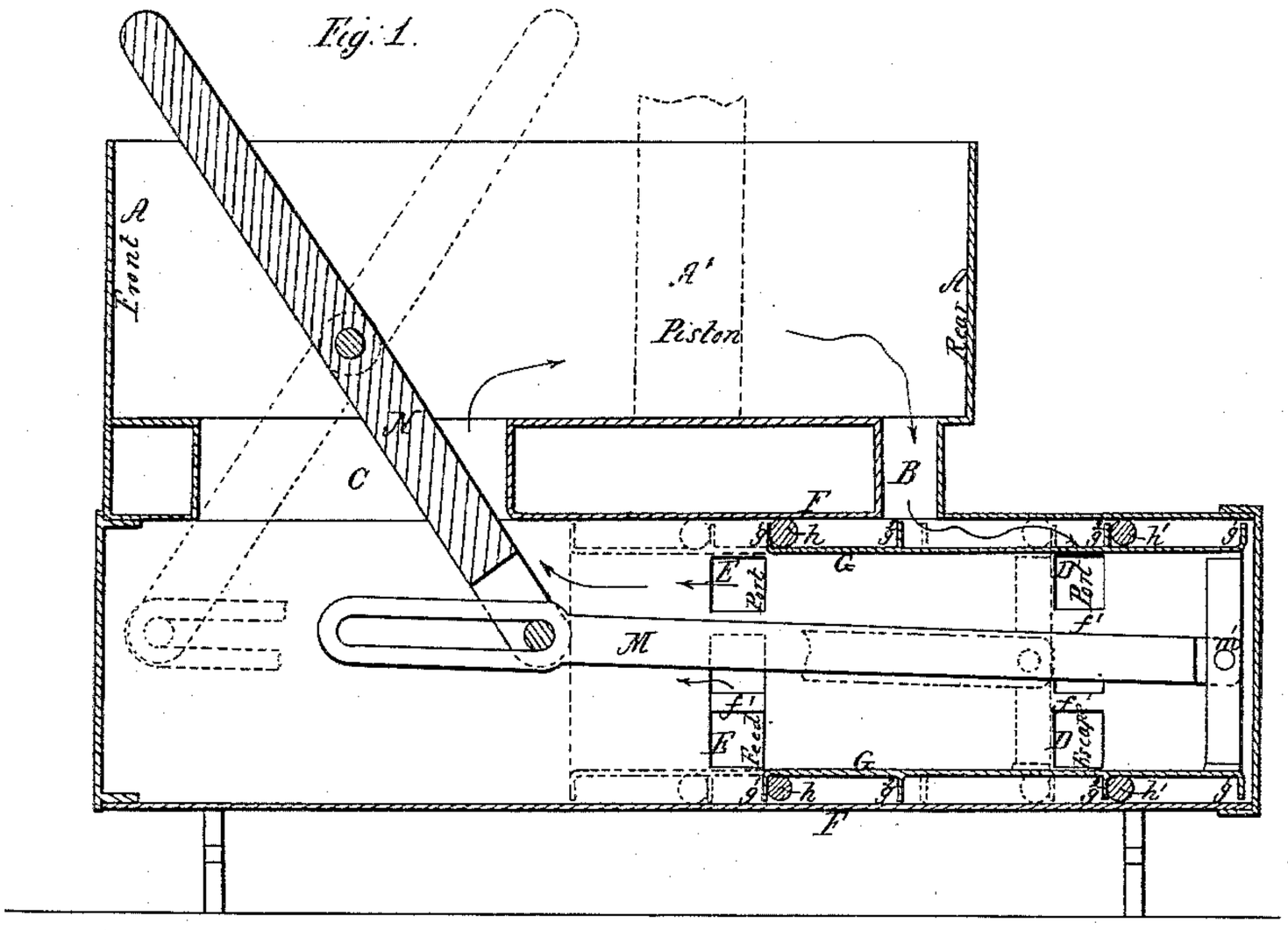
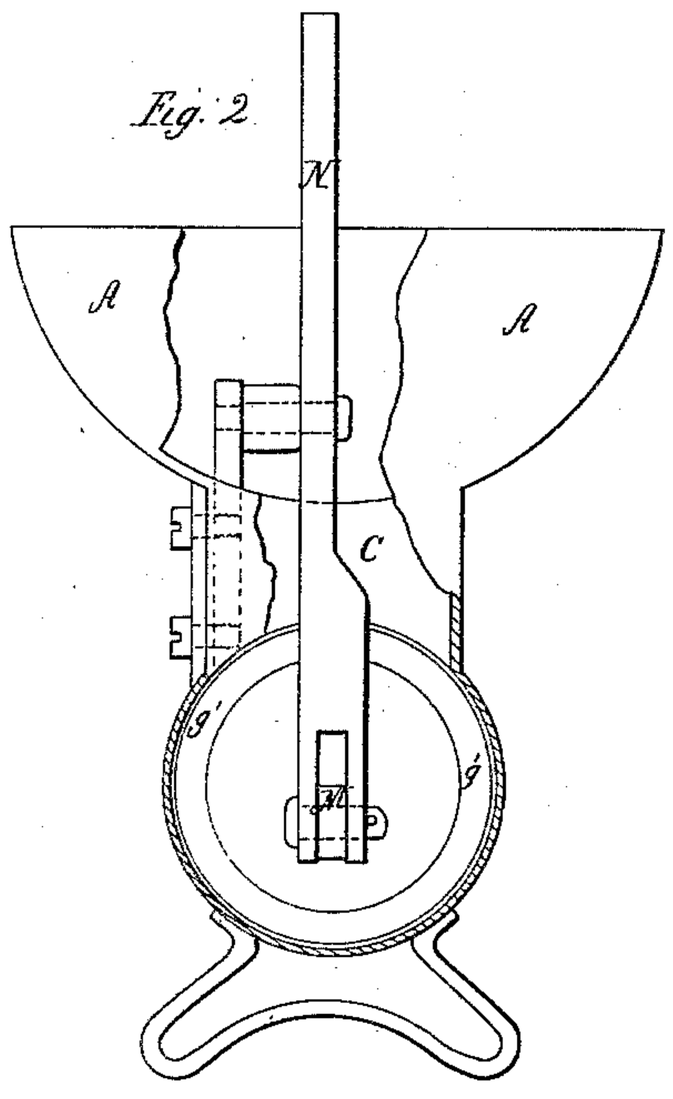


Fig. 2.



Witnesses;
Edw. F. Brown
R. S. Campbell.

Inventor;
Robt. Creuzbaur

United States Patent Office.

ROBERT CREUZBAUR, OF BROOKLYN, NEW YORK.

Letters Patent No. 88,371, *dated March* 30, 1869.

IMPROVEMENT IN PISTON-VALVES FOR STEAM AND OTHER ENGINERY.

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

Be it known that I, ROBERT CREUZBAUR, of the city of Brooklyn, Kings county, State of New York, have invented an Improved Valve; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my improvement consists in the construction of a valve of a hollow cylindrical casing, with one or more flexible rolls stretched around it, between retaining-flanges, which rolls form the packing and closing-joints of the valve, whereby to produce a balanced valve, free of leakage, free of concussion in its operation, cheap of construction, durable, and the efficacy of which is not affected by impurities held suspended in the fluid in which it operates.

Its application is principally to meters, wherein one such valve, with two rolls, controls four ports.

It is also applicable in some classes of engines, such as water-pressure engines, low-pressure, air, and other engines, and pumps.

In some cases, where the difference of pressure on the two sides of the piston is considerable, a valve, with one ring, or roll, is used to each port. Where that difference is not considerable, one valve, with two "rolls," controls four ports.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a longitudinal elevation in section, through the centre of the valve; and

Figure 2 is a front view, part of the covers supposed to be removed.

The illustration selected is its application to a fluid-meter, in which the parts which operate the valve are at one end, within the working-cylinder and valve-casing, surrounded by the fluid being measured.

A A represent part of a cylinder, wherein a piston, A′, reciprocates.

B and C are the two ports, connecting the valve with the two ends of the cylinder.

D and E are the feed and escape-ports, assuming E to be the feed-port.

F is the cylindrical valve-casing.

G is the body of the valve, being a cylinder, open at both ends, with two end flanges, g^1, and two middle flanges, g^2.

h h′ are two elastic ring-like rolls, a little larger in thickness than the space left between the valve-casing F and the body of the valve G.

M is the valve-stem, hinged to it at *m′*, and connected at the other end, in this case, to a rocking beam, N, which gives it motion.

It is evident that this stem may be rigid, as well as hinged, and may pass out through a stuffing-box, and receive motion in any of the usual ways.

The operation of the valve is as follows:

In the position shown, the fluid enters at E, and passes through port C to the front of the piston, which it forces to the rear; and the fluid in the rear of the piston passes through port B, around the valve-body G, and out through escape-port D.

When the piston has reached its extreme rear position, the valve is shifted, by any of the usual ways, into the dotted position.

Now, the fluid entering through E, passes around the outside of the valve-body G, and through port B, to the rear of the piston, which it forces forward; and the fluid in front of the piston is forced out through port C, and through the centre of the valve, and passes out through escape-port D. This completes one revolution.

It will be noticed that the valve-casing travels twice the distance of the rolls, and must have a throw accordingly.

This throw need not be accurate, as it is only requisite that the roll *h′*, in the forward motion, stop at any point between the ports D and B, and the roll *h*, in the back motion, at any point between the ports B and E.

As the rolls have a set, tending to roll them into the position of rest, the beginning and the end of the stroke should be that position of rest, and, therefore, the stroke of the valve just twice the circumference of the roll; the latter to roll over once, so that the roll will tend to hold the valve at either end of the stroke.

For non-compressible fluid, such as water, the flow of which must not be checked during the throw, the rolls are made thin, and the ports wide, so that the latter can only be partially closed during the travel of the roll over them.

The rolls work best when the port-opening is divided on opposite sides, and with ribs *f′*, of the casing, left standing, as shown, to serve as a support for the roll to roll over.

When only one roll is used, which controls only one port, the roll must close the port by stopping right over it, for which purpose it must have a seat to check it in that position.

In elastic fluids, the port is extended entirely around the casing F, and is made very narrow, while the roll is made very thick, so that the port can be entirely closed by the roll; because, in the change of ports, the escape and feed-ports must be entirely and simultaneously covered, to prevent the feed-gas from passing out directly through the escape-port, without passing through the meter, or engine.

This arrangement is applicable to non-compressible fluids also.

This improvement is applicable to all kinds of piston-valves.

What I claim, is—

1. One or more elastic rolls, arranged in relation to the ports of a piston-valve, substantially in the manner described.

2. The arrangement, consisting of the cylindrical open valve-casing G, rolls *h h′*, flanges *g*, ports B C D E, and stem M, substantially as described.

ROBT. CREUZBAUR.

Witnesses:

EDM. F. BROWN,
R. T. CAMPBELL.