

C. HODGKINS.

Water-Ram.

No. 133,368.

Patented Nov. 26, 1872.

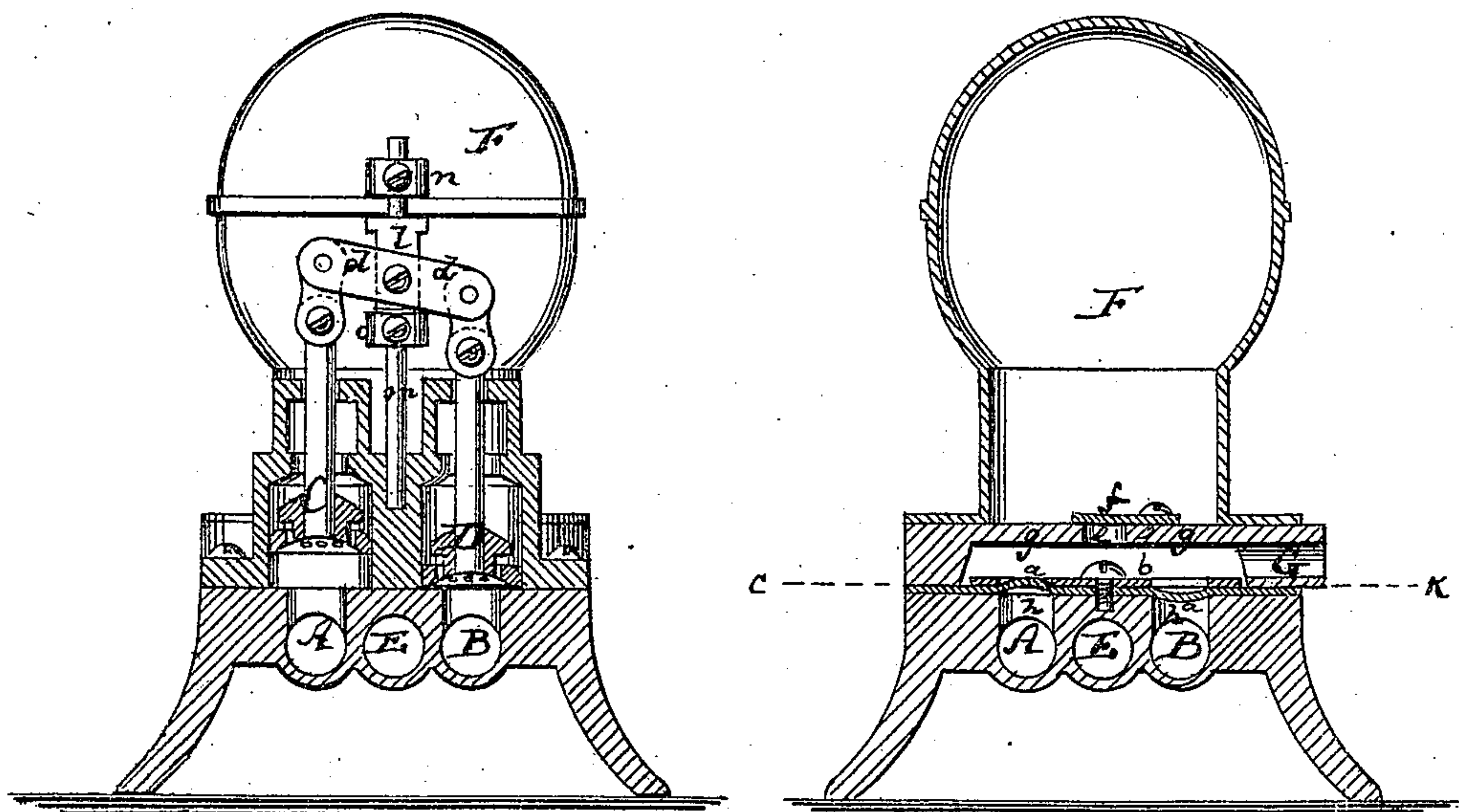


Fig. 3.

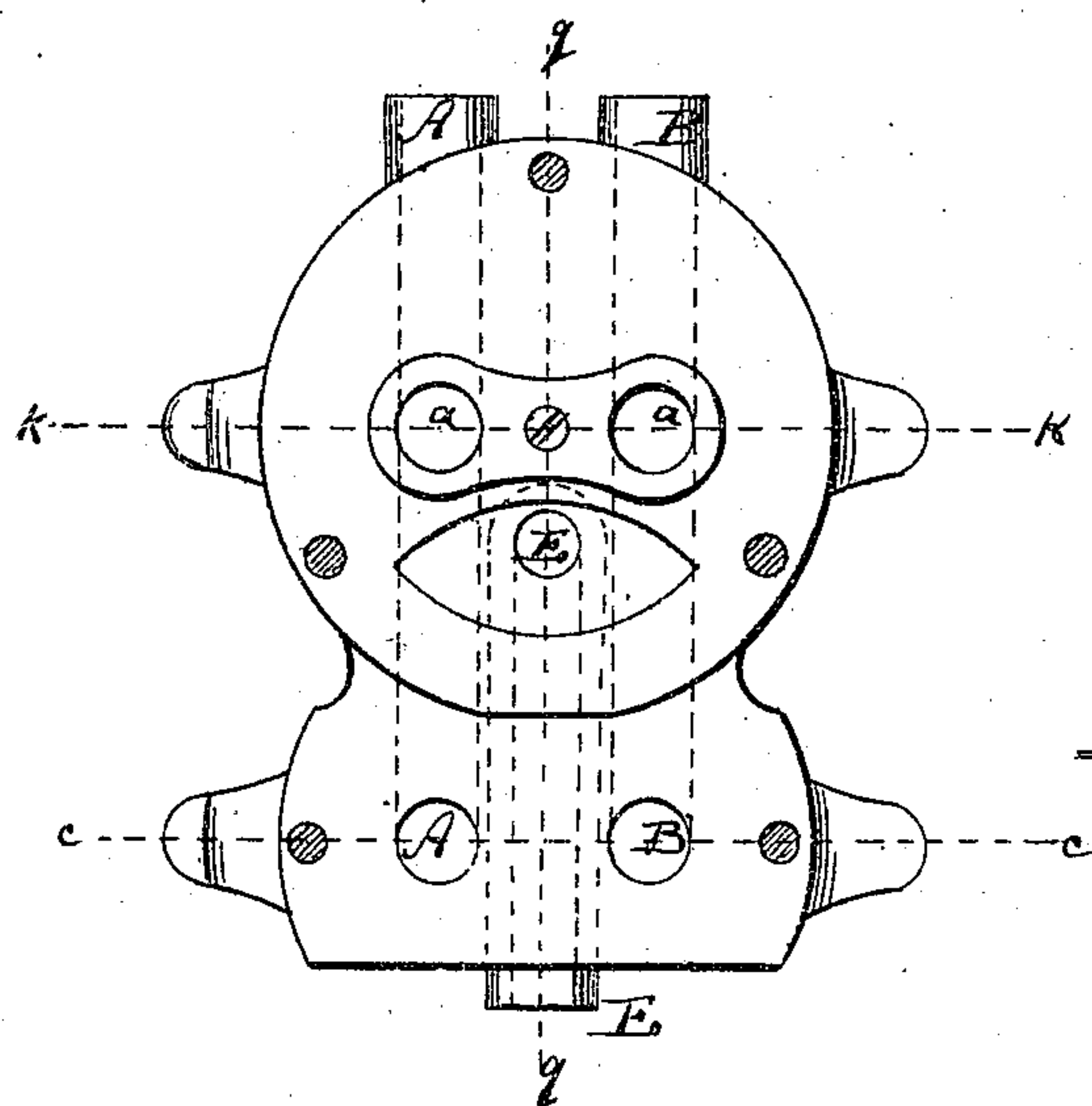
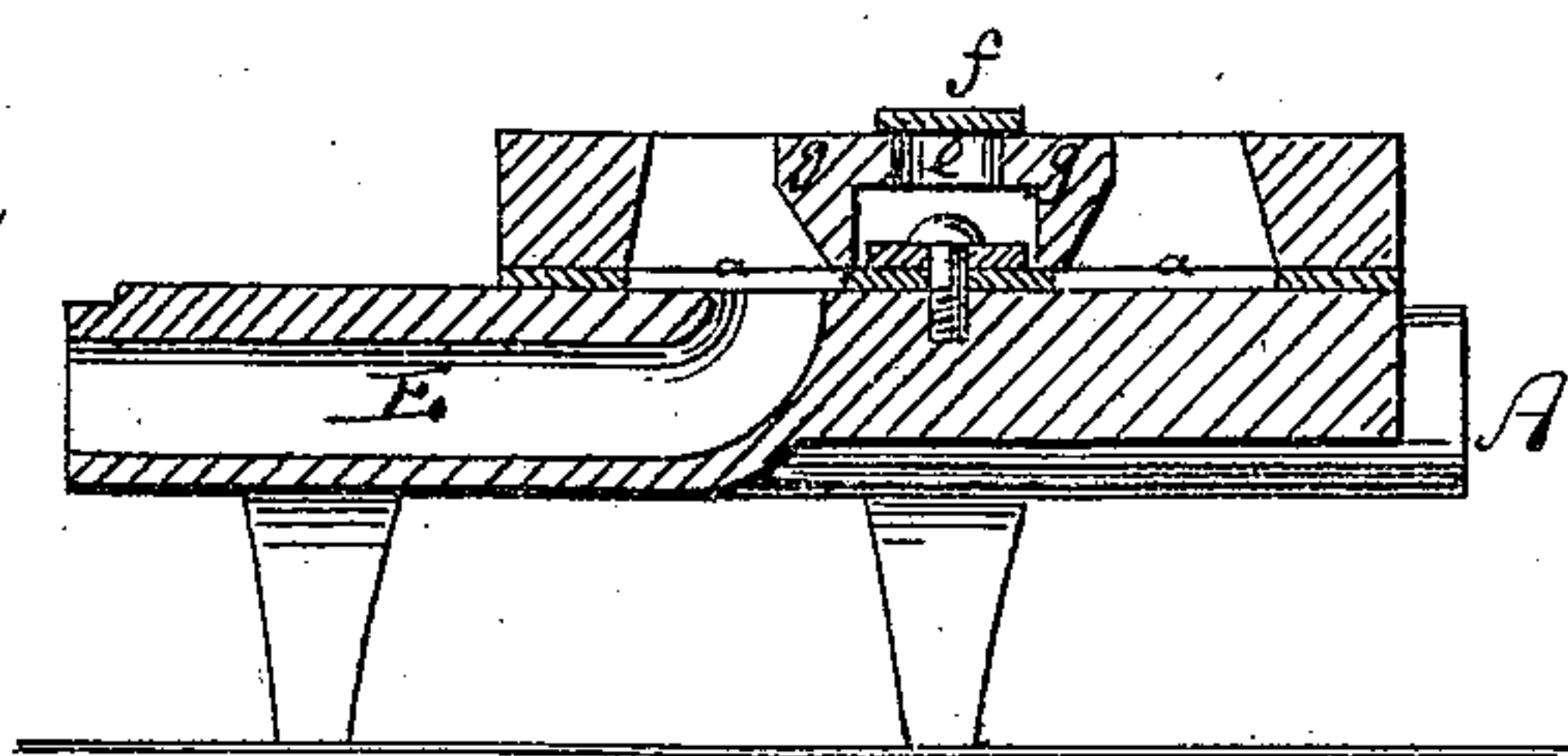


Fig. 4.



Witnesses:

E. Woff.  
W. A. Graham

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PER

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# UNITED STATES PATENT OFFICE.

CHRISTOPHER HODGKINS, OF MARLBOROUGH, NEW HAMPSHIRE.

## IMPROVEMENT IN WATER-RAMS.

Specification forming part of Letters Patent No. 133,368, dated November 26, 1872.

*To all whom it may concern:*

Be it known that I, CHRISTOPHER HODGKINS, of Marlborough, in the county of Cheshire and State of New Hampshire, have invented a new and Improved Water-Ram, of which the following is a specification:

Figures 1 and 2 are vertical transverse sections of my improved hydraulic ram, the *c c* and *k k*, Fig. 3, indicating, respectively, the planes of section. Fig. 3 is a horizontal section of the same taken on the line *c k*, Fig. 2. Fig. 4 is a detail longitudinal section on the line *g g*, Fig. 3.

Similar letters of reference indicate corresponding parts.

The invention consists in holding the valve-beam by a slide, arranged as hereinafter fully described and subsequently pointed out in claim.

A B in the drawing are the two supply-pipes of the ram, provided at their outer ends with valves C D, which are suspended from a beam, *d*, substantially as and for the same objects specified in the Letters Patent of the United States numbered 119,764, and dated October 10, 1871, which were granted to me. E is the discharge-pipe, and F is the air-chamber, but instead of communicating directly with the air-chamber, as in my former invention, the pipes A B are in the present case separated therefrom by diaphragms *a a*, of leather, rubber, or equivalent fabric, made slightly bagging, where it is above the apertures *h h* of the pipes A B, as shown more particularly in Fig. 2. The spring-water or liquid to be raised is admitted through a pipe, G, to a chamber, *b*, which is interposed between the diaphragms *a* and the bottom of the air-chamber F. A valve, *f*, closes a hole, *e*, in the bottom of the air-chamber. Thus it will be seen that the operating water in the pipes A B is

separated from the water to be raised by the bagging diaphragms *a*. The water to be raised, which I will call the spring-water, is further separated from the discharge-pipe by the valve *f*. When the valve *c* of the pipe A is raised the pressure of water within A causes the diaphragm above it to be swelled up, and the spring-water in the chamber *b* being thereby pressed, and being less elastic than the air in the chamber F, raises the valve *f* and enters the air-chamber, whence it escapes to the discharge-pipe E. The same action will be effected alternately by the pipes A B, as their respective valves are closed. The invention, as far as it relates to the diaphragm interposed between the two kinds of liquid, is also applicable to single rams that have but one supply-pipe, A or B. The beam *d* is, at its center, pivoted to a slide, *l*, working up and down on a fixed vertical rod, *m*, between two adjustable collars, *n* and *o*, thereon. The upper collar, *n*, is set sufficiently high to prevent both valves from closing at once, while the lower collar, *o*, regulates the stroke of the valves. The slide *l* adjusts itself up and down, according to the head of water, and serves also to let one valve work alone, if the other should get clogged, the latter being in that case soon worked loose by the jar of the one that operates.

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

The slide *l*, holding the beam *d* of the valves arranged on the stem *m*, together with the adjustable collars *n* and *o*, as specified.

CHRISTOPHER HODGKINS.

Witnesses:

WM. M. NASON,  
ELIJAH BOYDEN.