M. B. BRANNEN.

Relief-Pistons for Pumps.

No. 212,180. Patented Feb. 11, 1879.

Fig: 1.

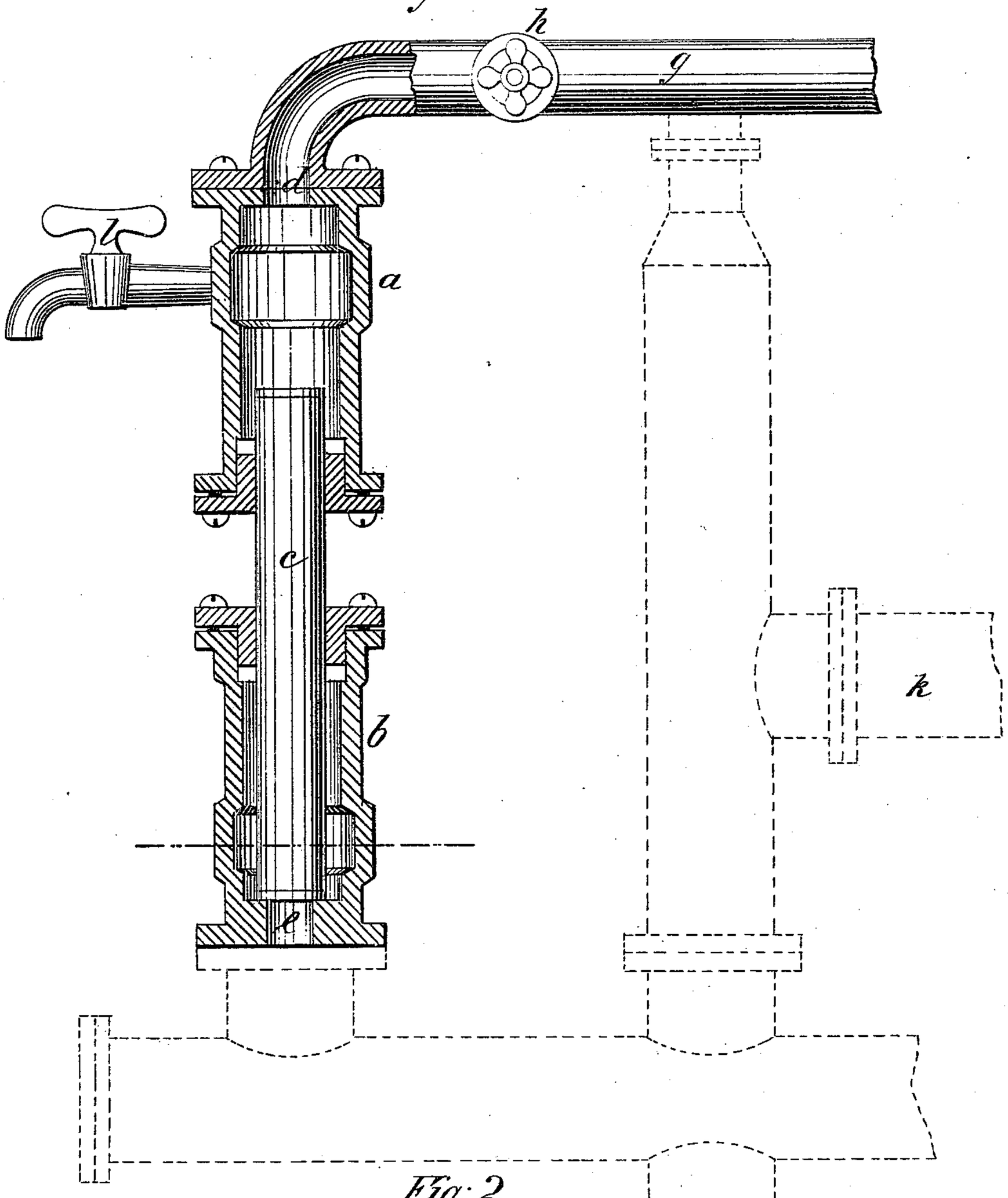
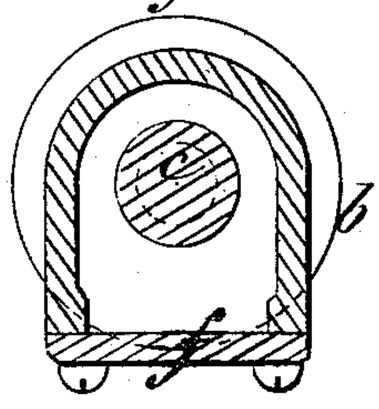


Fig: 2.



WITNESSES:

Achilles Schehl.

C. Sedgwick

INVENTOR:

M. B. Brannen

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

MICHAEL B. BRANNEN, OF SHENANDOAH, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOHN L. WILLIAMS, OF SAME PLACE.

IMPROVEMENT IN RELIEF-PISTONS FOR PUMPS.

Specification forming part of Letters Patent No. **212,180**, dated February 11, 1879; application filed December 27, 1878.

To all whom it may concern:

Be it known that I, MICHAEL B. BRANNEN, of Shenandoah, in the county of Schuylkill and State of Pennsylvania, have invented a new and Improved Relief-Piston for Pumps, of which the following is a specification:

In pumping water, especially when two pumps are used and discharging to the same column, there is always jar and strain at the end and commencement of the stroke, owing to the shutting of the valves, so that when the water has to be lifted a long distance high speed of the pumps is not safe.

The object of my invention is to relieve the pressure between the piston-head and valves by the elastic action of an air-cushion, which will enable the piston to commence its stroke more easily than when the whole load is upon it in starting.

The invention consists in the use of a plunger or piston fitted in a chamber at each end, which chambers are connected one with the column and the other with the suction-pipe. The piston is pressed in one direction by elastic action of air contained in one chamber and moved in the other direction by the pressure of water caused by the pump.

In the accompanying drawings, Figure 1 is a sectional elevation of my relief apparatus. Fig. 2 is a cross-section on line *x x*.

Similar letters of reference indicate corresponding parts.

a b are cylinders, placed in line, and forming chambers at the opposite ends of the loose piston or plunger *c*, which works through air-tight packings in the heads of the cylinders *a b*. Each cylinder at the end opposite its head is formed with a flange for connection of pipes, as hereinafter described, and also with an opening smaller in diameter than piston *c*, as seen at *d e*, and in operation the piston closes upon these openings. The edges of openings *d e* form seats for the end of the piston, and may be tapered, if desired, and the ends of the piston provided with rubber disks, so that they will close air-tight. In the side of each cylinder *a b* is an opening having a man-hole plate, as seen at *f*, through which opening access may be had to the seats.

The opening *d* in cylinder *a* communicates with a pipe, *g*, which I call the "air-pipe," that has connection with the column of water. In the pipe *g* is a cock, *h*, for regulating the pressure of air in pipe *g* and cylinder *a*. The opening *e* in cylinder *b* communicates with the suction-pipe of the pump, so that there is free passage for water to cylinder *b*. The suction-pipe is represented in dotted lines at *i*, and the column-pipe at *k*.

In the position of piston *c*, as shown in the drawings, it is closed against opening *e* in cylinder *b*, and the next stroke of the pump will act to force the water that has been drawn by the suction-pipe into the column-pipe. When the pump first starts the pressure upon the water will be communicated through the opening *e* to piston *c*, which will be caused to rise against the air in cylinder *a*, thus relieving the pump of part of its load for a moment until the pump has obtained a momentum.

The elastic air-cushion in cylinder *a* and pipe aids the start of the pump on the return stroke, and returns piston *c* to the position shown in the drawings.

It is to be understood that the valves of the pump operate in the usual manner, my relief device being independent in its action. The cylinder *a* is provided with a cock, *l*, to permit the escape of air from cylinder *a* when it is desired to repair the packing of piston *c*.

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

1. In combination with water-pumps, a relief piston or plunger, fitted in cylinders that are connected one with the suction-pipe and the other with the water-column, substantially as described and shown, and for the purposes set forth.

2. The combination and arrangement of the cylinders *a b* and piston *c* with the suction-pipe and water-column of a pump, substantially as described and shown, and for the purposes specified.

MICHAEL B. BRANNEN.

Witnesses:

JOHN J. REESE,

JAMES WOOLEY.