W. A. SIMONDS.

Fluid Regulator.

No. 54,424. Patented May 1, 1866.

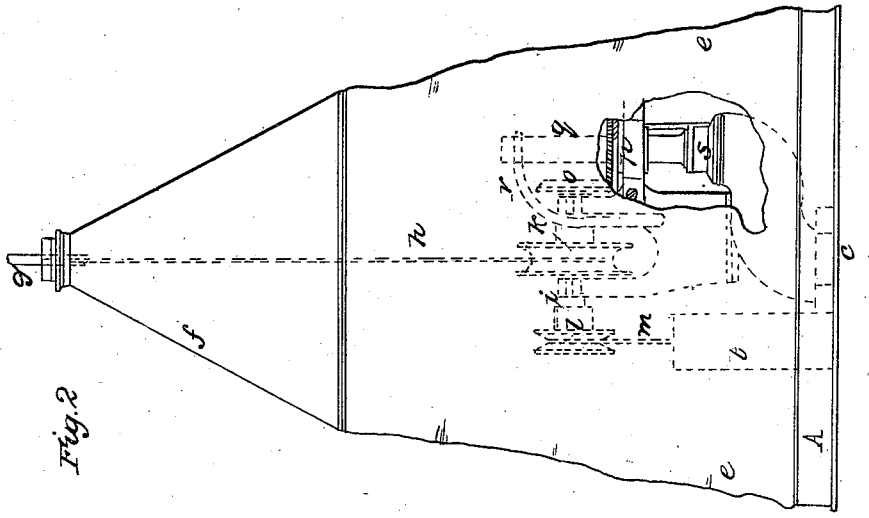

Fig. 2

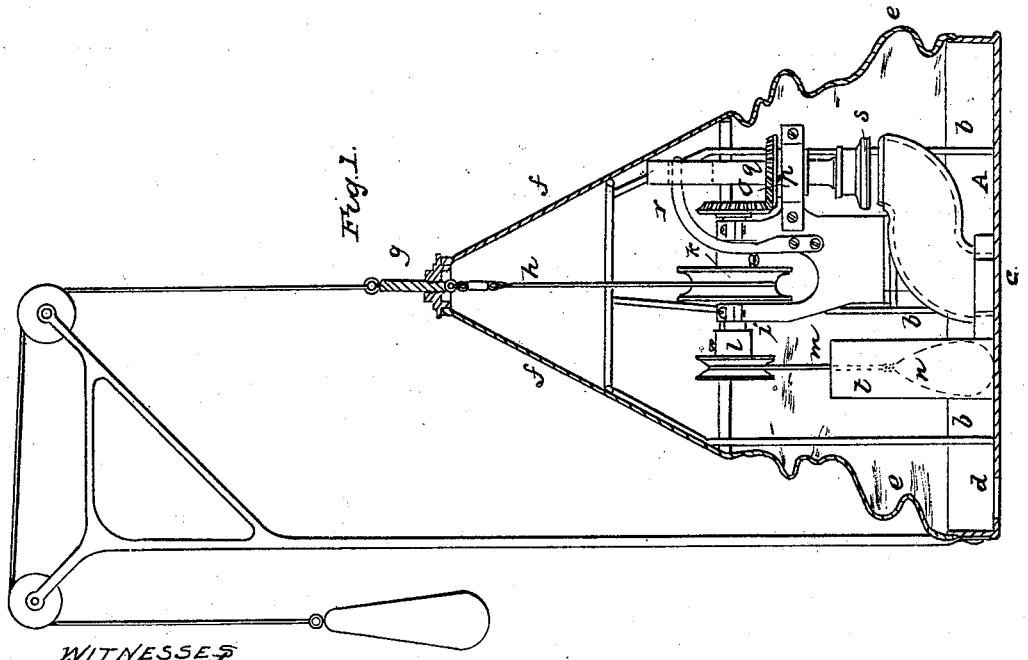

Fig. 1.

WITNESSES

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WARREN A. SIMONDS, OF BOSTON, MASSACHUSETTS.

IMPROVED FLUID-REGULATOR.

Specification forming part of Letters Patent No. **54,424**, dated May 1, 1866.

To all whom it may concern:

Be it known that I, WARREN A. SIMONDS, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Regulators of the Delivery of Fluids; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, sufficient to enable others skilled in the art to make and use the same.

Figure 1 is a section with the valve open. Fig. 2 shows the machine filled and the valve closed.

A is a base or platform, on which is arranged a wire frame, *b*. There are two holes or openings in this platform—one for the inlet of the fluid, *c*, the other for its delivery, *d*. The inlet is arranged with a pipe surmounted by a valve-seat, as drawn. A diaphragm of elastic material, such as rubber, *e*, fluid-tight, is fastened to the base and surrounds the wire frame *b*. It is somewhat conical in shape and is fastened at the top to the cam *f*, which has at its top a rod, *g*, attached with a counterpoise that nearly balances the gravity of the cone, and by adjusting the weight of which the pressure on the fluid passing through the regulator can be controlled. To the interior of the apex of cone *f* is attached a cord, *h*.

Near the center of the space inclosed by the diaphragm suitable standards are erected to support a shaft, *i*, which carries two pulleys, *k*, round which is wrapped cord *h* and *l*, round which is wrapped in an opposite direction the cord *m*, attached to weight *n*.

At the opposite end of the shaft *i* from pulley *l* is placed a bevel cog-wheel, *o*, gearing into another cog-wheel, *p*. The center of wheel *p* is pierced by a female screw in which works the male screw *q* of the valve-stem. The valve-stem has a slot at its upper end, through which passes guide-finger *r*, and at its lower end is the valve *s*, which may be so constructed as to close against the column of fluid entering at opening *c* or aided by it.

The conical form of cap or cover to this machine is a great advantage, and, when combined with rod *g*, renders it impossible for the regulator to act otherwise than uniformly and perpendicularly, while with the old-fashioned flat disk it was exposed to variable action, owing to the instability of balance of the disk and its liability to cant and vary the pressure.

The use of bevel-gearing to operate a nut and screw and give gradual motion to the valve-stem is also a great improvement over the former method of using either a plug or globe-valve, and the addition of a case or cylinder, *t*, to guide the weight *n* is also an improvement of much practical benefit when the regulator is not placed upon a stationary but upon a movable reservoir of fluid.

The conical top may be combined with a bell working in a double reservoir of water, mercury, or suitable liquid to prevent the escape of the fluid passing through the regulator; and the principle involved in this arrangement will be the same as that in the regulator with elastic diaphragm.

I do not claim to operate a valve by the most predominant of two counteracting forces, for that has been done before, nor to make a counterpoised variable receptacle to control the delivery of fluids, for that is also old; but

I do claim as my invention and desire to secure by Letters Patent—

1. The combination of the cone *f* and rod *g*, as and for the purpose described.

2. The arrangement of the bevel-gears *o* and *p* with the shaft *i* and valve-stem, substantially as described, and for the purpose stated.

3. The arrangement of the guide-finger *r* with the slotted valve-stem, to prevent rotation of the valve or stem.

WARREN A. SIMONDS.

Witnesses:

THOS. WM. CLARKE,
CHARLES BATEMAN.