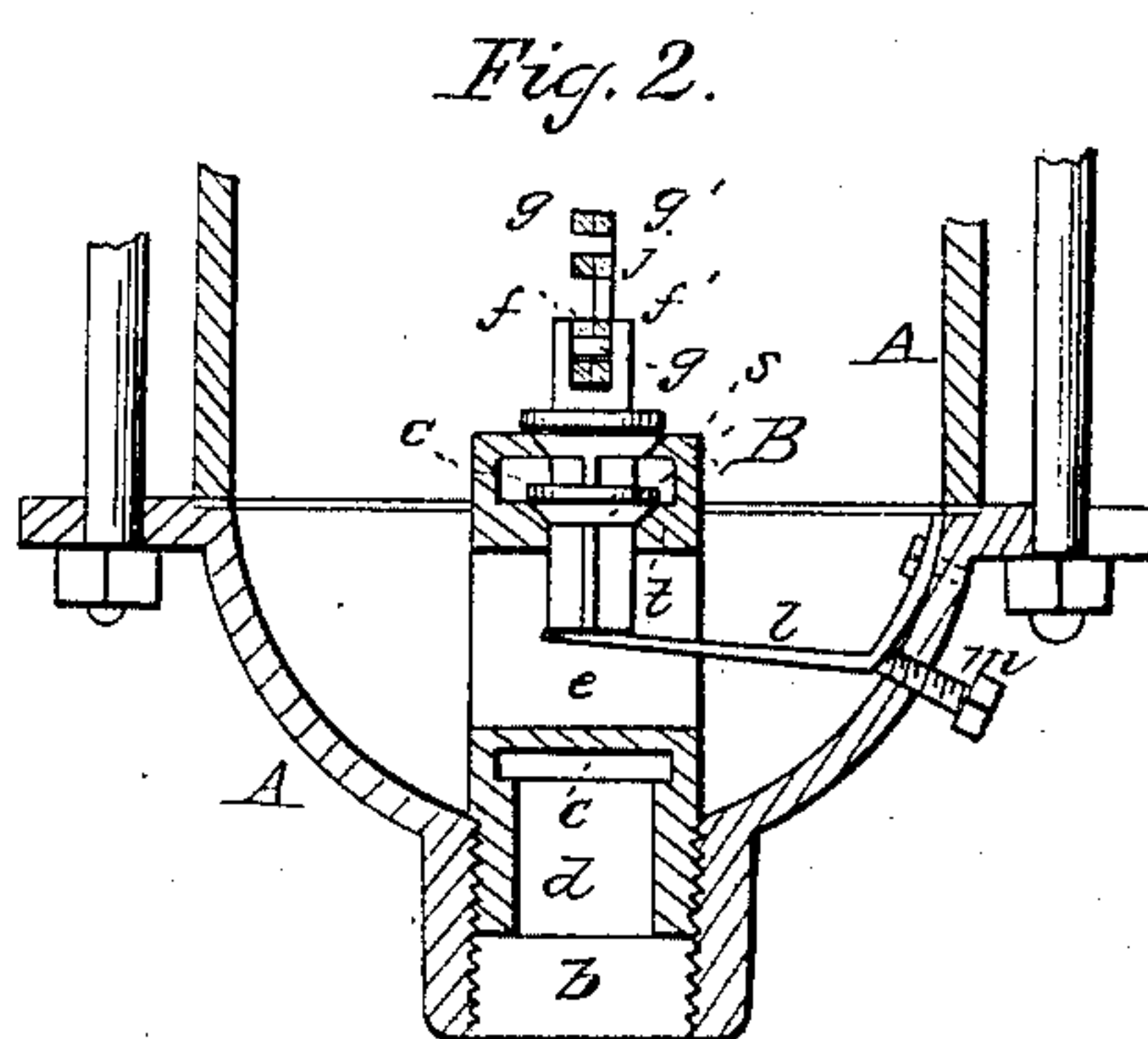
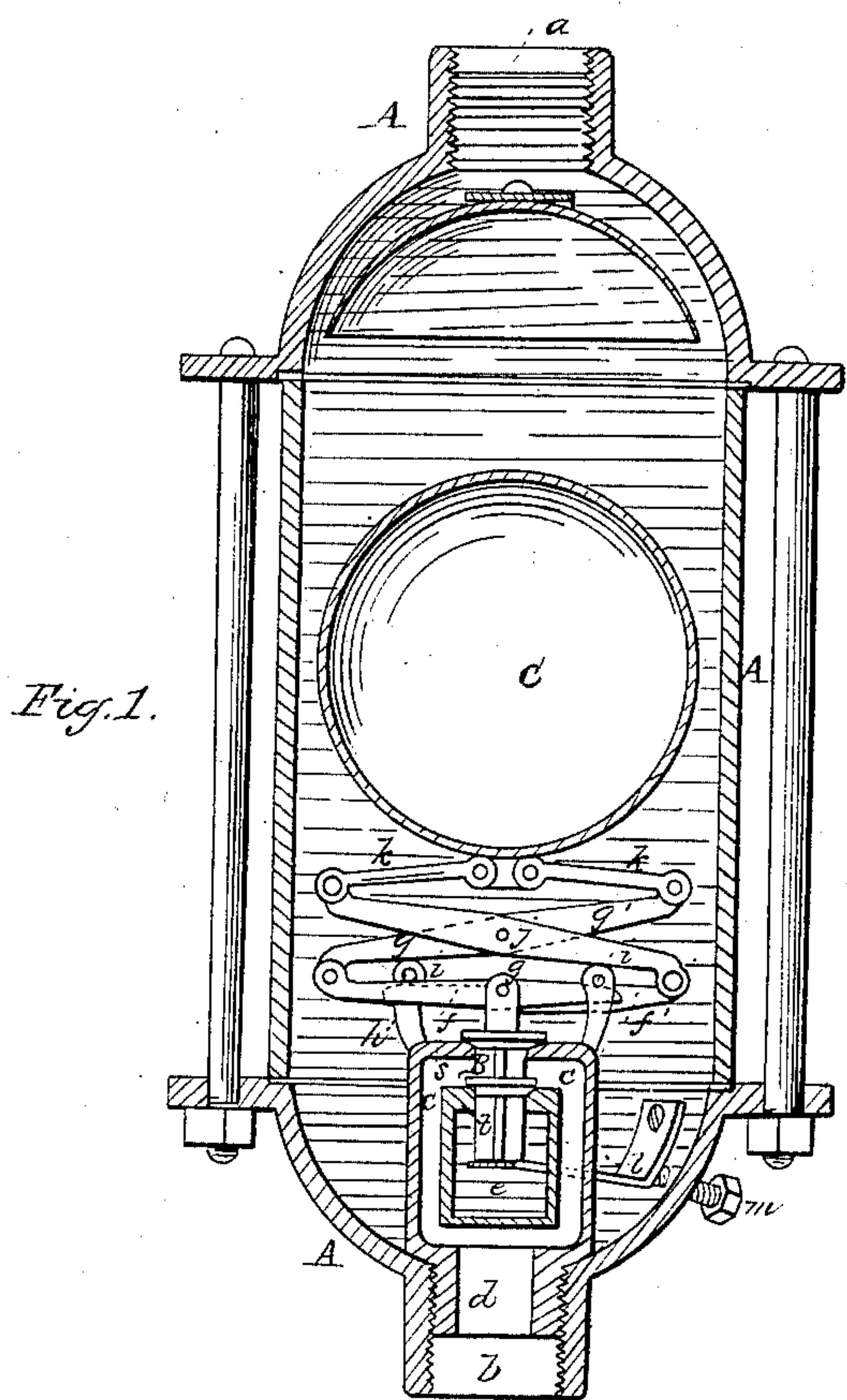


*F. Douglas,*  
*Steam Trap,*  
*No 27,040,* *Patented Feb. 7, 1860.*



*Witnesses:*  
*R. S. Spencer*  
*J. W. Coombs*

*Inventor:*  
*F. Douglas*  
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# UNITED STATES PATENT OFFICE.

FRANK DOUGLAS, OF NORWICH, CONNECTICUT.

## IMPROVED STEAM-TRAP.

Specification forming part of Letters Patent No. 27,040, dated February 7, 1860.

*To all whom it may concern:*

Be it known that I, FRANK DOUGLAS, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Steam-Traps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section of a steam-trap with my improvement. Fig. 2 is a central vertical section of the valve, valve-seat, and passages at right angles to Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

My invention relates to that kind of steam-trap whose valve is opened by a float.

It consists, first, in a certain arrangement within a steam-trap of a double puppet-valve and its seats and of the passages leading from the said seats to the outlet of the trap, whereby the valve is nearly balanced, and at the same time provision is made for the free egress of the water of condensation.

It also consists in a certain arrangement of connections between the puppet-valve and the float, whereby the valve is acted upon very easily by the float.

It further consists in a certain mode of applying a spring and set-screw in combination with each other and with the valve, whereby the valve may be perfectly balanced when in operation or may be opened to let out the water remaining in the trap when the steam apparatus with which it is connected is not in operation.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the box or casing of the steam-trap, made in the form of an upright cylinder with a dome-shaped top and inverted-dome-shaped bottom or of other suitable form, having the inlet-opening *a* at the top and the outlet-opening *b* at the center of its bottom.

*s t* represent the seats for the two heads of the double puppet-valve B, made of the same piece of metal with the two passages *c c* and the screwed nozzle *d*, the said passages forming communications from the space between the two valve-seats to the interior of the screwed nozzle *d*, which is screwed into the outlet-opening *b* of the box A, and so prevents any

egress through the bottom of the box, except through the valves. The space *e* between the passages *c c* below the lower valve-seat is open, so that the pressure of steam in the box A acts upon the bottom of the lower head and stem of the valve, as well as upon the top of the upper head and stem, and hence the pressure above and below the valve is very nearly balanced, the upper head of the valve being rather larger than the lower one and consequently subject to a little excess of pressure, which tends to keep the valve closed.

*f f'* are two similar levers, each attached to the top of the valve B by the same pin *g*, passing through the upper part of the valve-stem. The shorter arm of each of these levers passes under a pin *i* in a slot in one of two small fixed standards *h h'*, that are attached to the piece which contains the passages *c c*, and the pins *i i* constitute the fulcrum of the said levers. The longer arms of the said levers *f f'* are attached by joint-pins, one to one end of each of two crossed levers *g g'*, which are connected together by a joint pin or fulcrum *j*, and whose other ends are connected by links *k k* with the float C. The crossed levers *g g'* may be dispensed with and the levers *f f'* connected directly with the links *k k*.

*l* is the spring applied to the valve for the purpose of relieving it to as great a degree as may be desired of the excess of pressure on the top of the valve, said spring being attached to the lower part of the interior of the box A and being caused to press upward against the bottom of the valve-stem by the pressure upon it of a set-screw *m*, screwed through the box A from the outside, the said screw serving to adjust the pressure of the spring according as it is screwed in more or less. When the box A is free of water or the water is not high enough therein to raise the float, the valve remains closed by its own weight; but as soon as the water rises high enough to lift the weight of the float, the levers, and the valve, the latter, being perfectly or so nearly balanced, is at once lifted from its seats, and the water escapes from the box through both valve-seats into the passages *c c*, and through them to the nozzle *d* and outlet *b*; but as soon as the water falls again the float descends and permits the closing of the valve by its own weight again. When the

operation of the apparatus to which the trap is applied is stopped, the screw should be screwed in to produce pressure enough on the spring *l* to make it lift the valve, and so permit the escape of all the water above the lower valve-seat, thus preventing the freezing up of the working parts.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the double valve *B*, its seats *s t*, passages *c c*, and connecting-nozzle *d* relatively to the outlet of the trap, substantially as herein described.

2. The connection of the puppet-valve with the float by means of one or more pairs of crossed levers, one pair applied to the valve-stem and acting against fixed fulera, as described.

3. The spring *l* and adjusting-screw *m*, applied in combination with each other and with the valve, substantially as and for the purpose herein specified.

FRANK DOUGLAS.

Witnesses:

GEO. PRATT,  
E. FRANK ROGERS.