

Z. L. Jacobs,
Steam-Boiler Water-Feeder,
No. 21,003, *Patented July 27, 1858.*

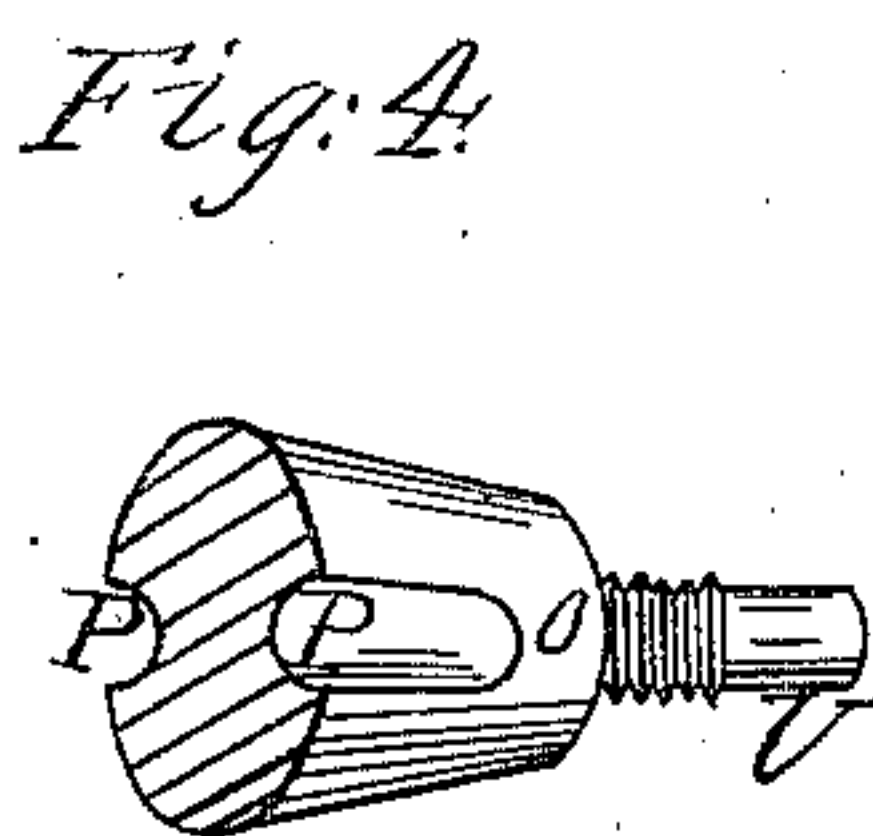
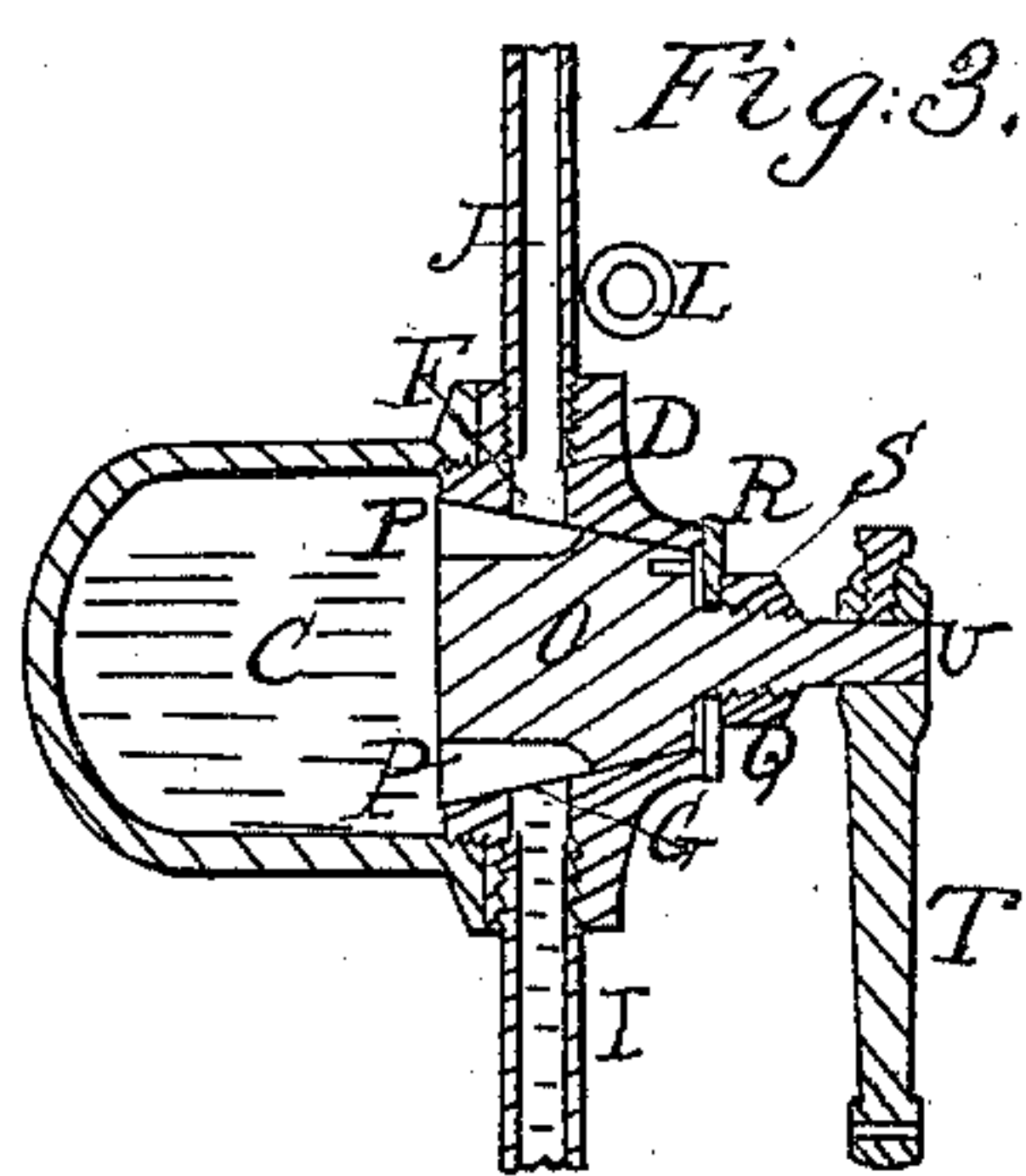
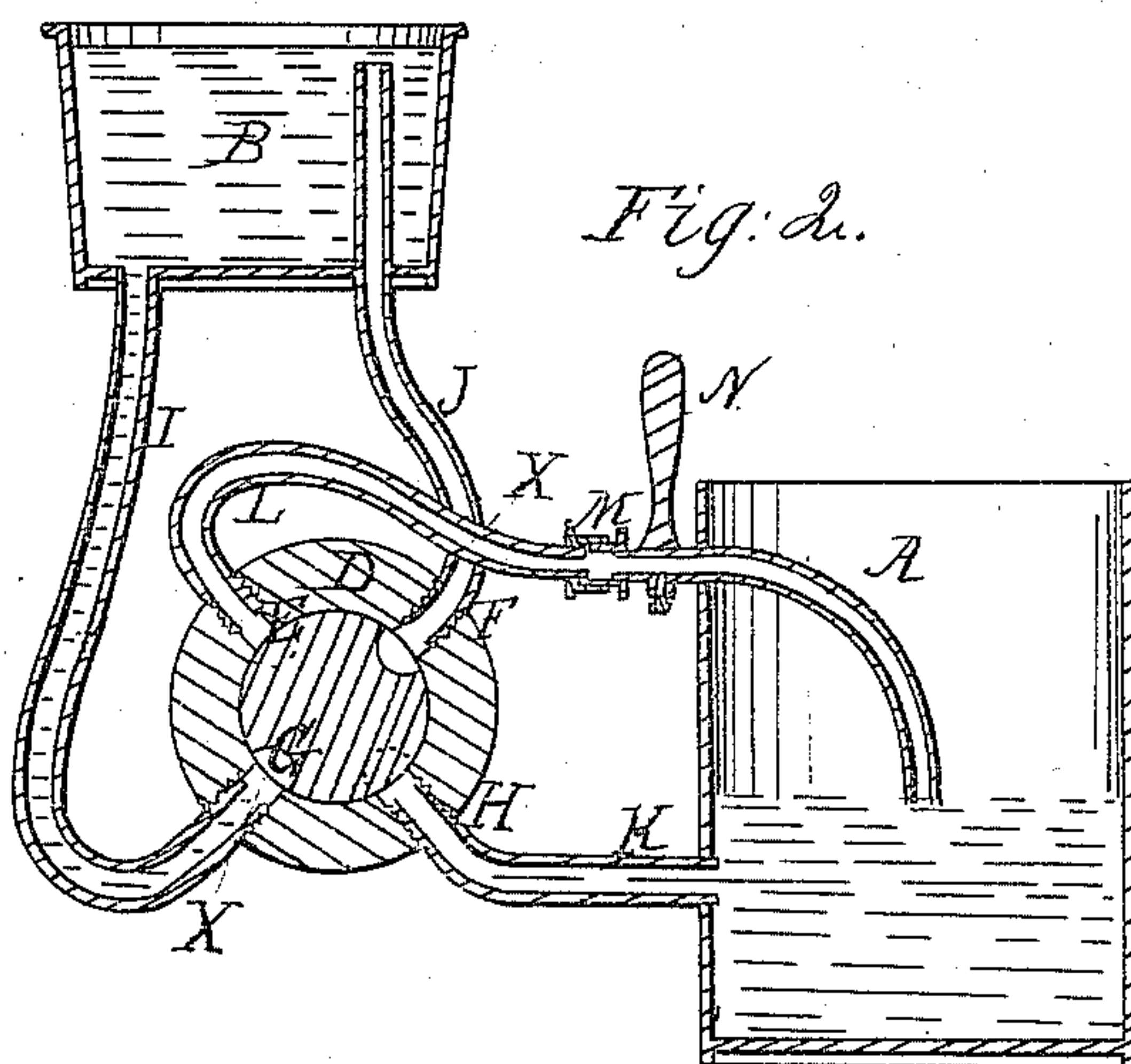
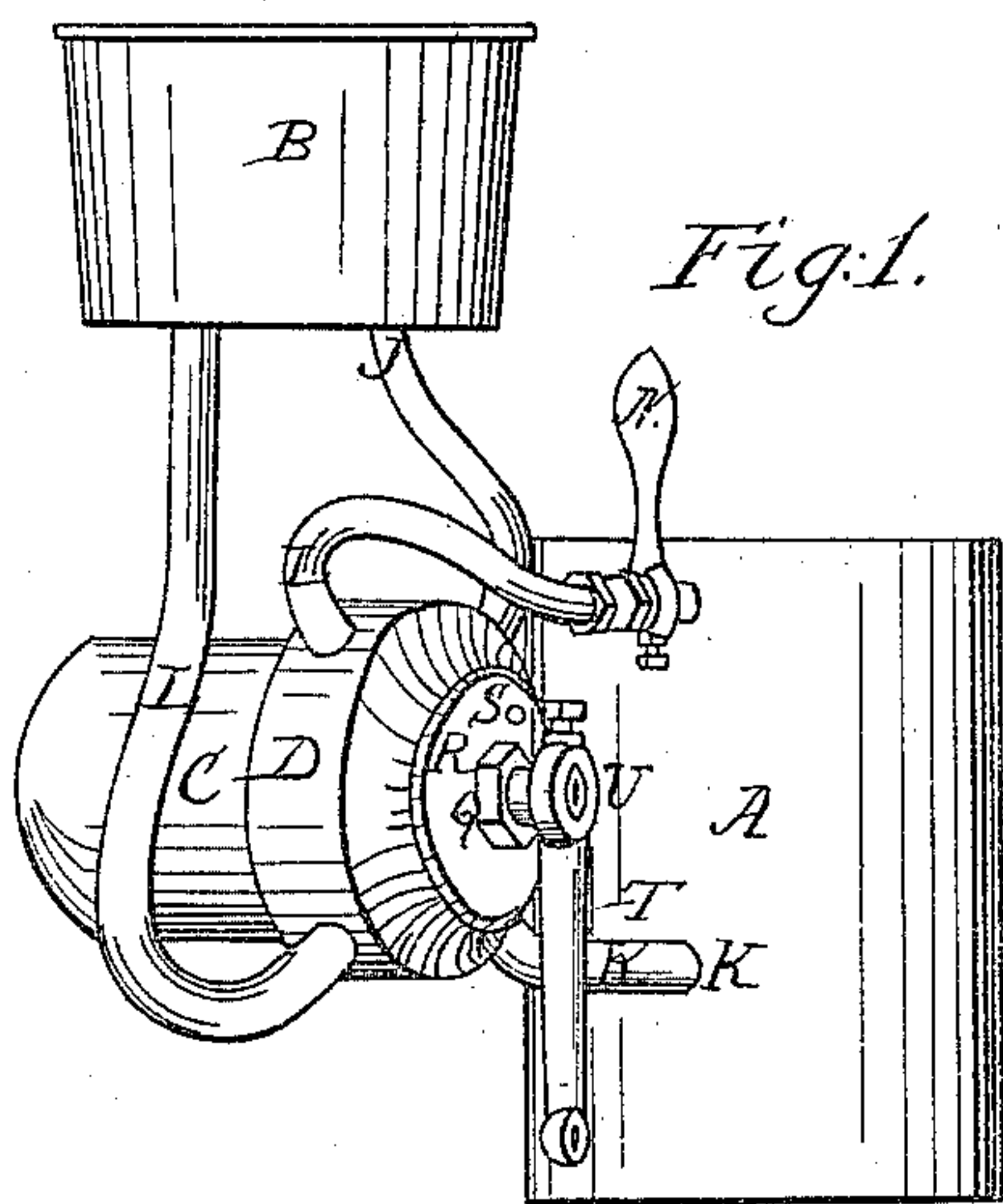
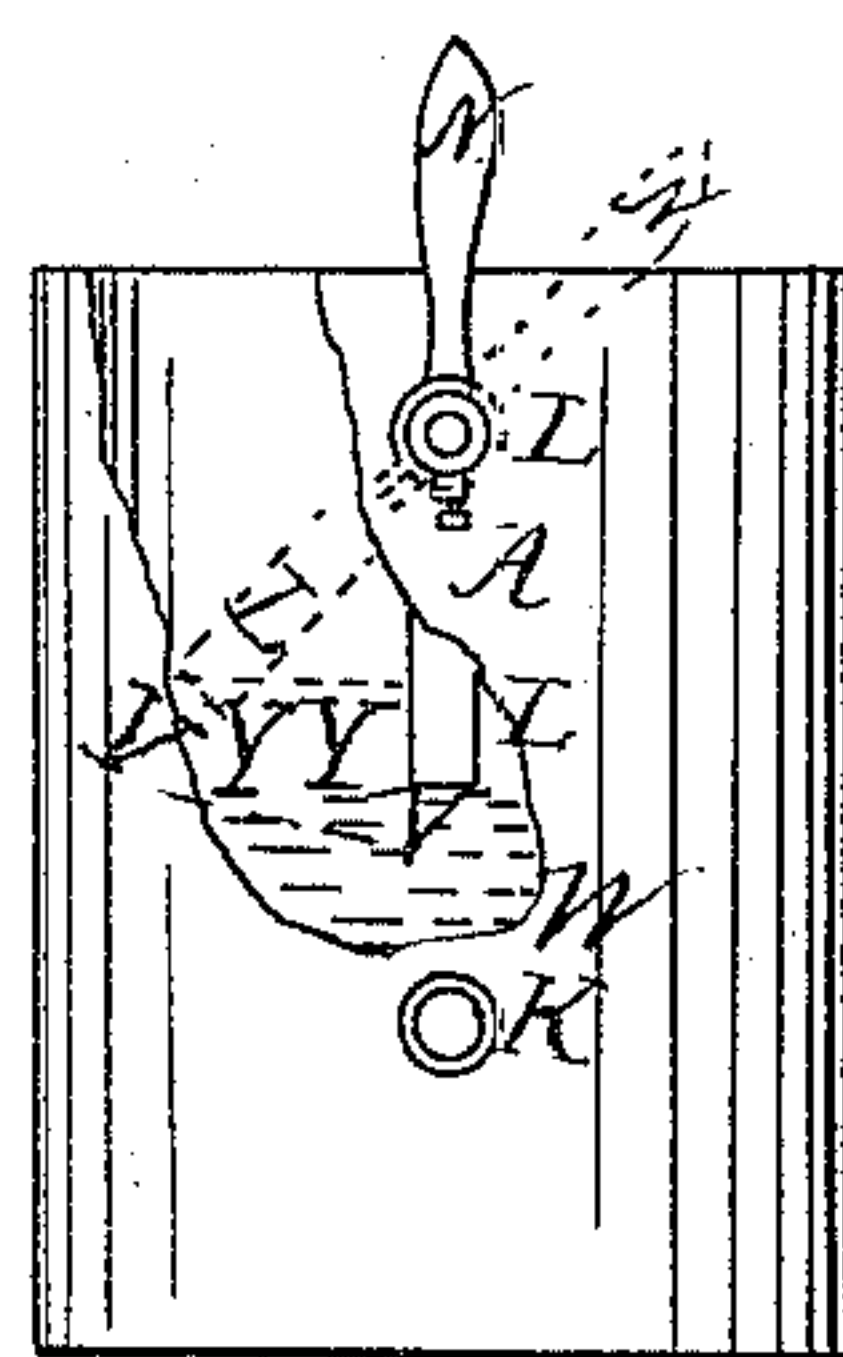


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

ZALMON L. JACOBS, OF HEBRON, CONNECTICUT.

APPARATUS FOR REGULATING THE SUPPLY OF WATER TO STEAM-BOILERS.

Specification of Letters Patent No. 21,003, dated July 27, 1858.

To all whom it may concern:

Be it known that I, ZALMON L. JACOBS, of Hebron, in the county of Tolland and State of Connecticut, have invented a new and useful Improvement in the Apparatus for Regulating the Flow of Fluids into Boilers and other Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my improved apparatus; Fig. 2, a vertical, longitudinal section thereof; Fig. 3, an oblique transverse section of the same through the line X X of Fig. 2; Fig. 4 a detached view of the plug or valve by whose movements the passages through the apparatus are opened and closed; and Fig. 5 a view partly perspective and partly sectional, showing how the line at which the fluid is designed to be sustained, in the vessel into which its flow is regulated, may be varied by means of my improved apparatus.

Similar letters of reference indicate like parts in all the figures.

The nature of my invention consists in constructing and arranging an apparatus, whereby, the flow of fluid, from a reservoir to a vessel below it, is automatically adjusted to the varying requirements of the latter vessel.

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

At a suitable distance above the receiving vessel A is arranged the reservoir B, and in a position lower than said reservoir and not so low that the proper performance of its functions shall be prevented by back water is arranged the box or chamber C, and to one end of said chamber is attached the ring D. Through said ring from its outer to its inner periphery, at equal distances from each other, and about midway between its sides, are four ports or openings E F G H, the first two in the upper and the last two in the lower portion thereof, as shown in Fig. 2; and of these ports or openings, two G F are connected by pipes I J with the reservoir B, and the others, H E by pipes K L with the receiving vessel A; so that I affords a communication between port G and the lower portion of the reservoir B; J be-

tween port F and the upper portion of said reservoir; K between port H and the lower or fluid space of vessel A; and L between port E and that line in A above which it is desired that the fluid shall not rise.

That the pipe L may be made to communicate with points of various heights in A, according to the several lines at which the fluid may be desired to stand in said vessel under different circumstances, it (the pipe L,) is made in two parts and connected together by a union M, so that that part which enters A may be turned on its axis by means of the lever N which is attached thereto for that purpose; and, as said portion of pipe L is of bent form, such a movement thereof will cause its lower end to assume positions of different heights, as shown in Fig. 5.

To the inner periphery of the ring D is closely fitted the frusto-conical plug or valve O, of which Fig. 4 is a detached view. Said plug has two ports or grooves P P, at opposite points in its periphery, which communicate freely, at all times, with the chamber C as shown in Fig. 3, and which are of a width somewhat less than that of each or any of the spaces between the ports of ring D on its inner periphery, and, of a length equal to about three fourths of the width of the said ring. Said plug is secured in its place by means of the nut Q, and the washer R, a steady pin S projecting from the plug and entering a hole in the washer, and thereby insuring the turning of the washer with the plug, and preventing the plug from becoming loosened by the friction of said washer against ring D. A lever T, or instead thereof a cog-wheel or other device, is firmly attached to the stem U of the plug for the purpose of facilitating the movement of the plug on its axis.

Such is the construction of this apparatus; the manner of using it is as follows: The reservoir B is kept full or nearly full of the fluid required in A, by means of an aqueduct or otherwise, and proper motion is imparted to the plug by means of steam or other power connected with the lever T, so that the ports P P of the plug, and the chamber C connected therewith, alternately communicate with the reservoir B and the receiving vessel A. Whenever the plug O is brought into such a position as to open a communication between the reservoir B and the chamber C, as represented by the full lines of Fig. 2, the fluid in and over I

by reason of its greater pressure, compared with that in and over J, will over-balance the latter, and consequently the fluid in B will flow by its gravity through I and the plug port connected therewith into C, and the aeriform contents of C will pass up through J and escape or be condensed; and whenever the position of the plug is changed, so that its ports assume the position indicated by the dotted lines in said Fig. 2, and a communication is thus opened between the chamber C and the vessel A, the fluid in C will flow down pipe K and into A, and a like bulk of the aeriform contents of A will pass through L and into C. Thus the fluid alternately flows from B to C, and from thence to A until its surface rises in A to such a height as to check or entirely stop the passage of air and other aeriform bodies through pipe L, when the flow of fluid from C to A will be checked or entirely stopped so as to prevent the rising of the fluid in A above the orifice V of pipe L. Thus the fluid in A will be sustained at a height very nearly corresponding with the height of said orifice of said pipe. It will be readily seen that as that portion of pipe L which enters A is movable, the chamber C and the reservoir B being sufficiently elevated above A, the fluid in A may be sustained at any desired height by simply adjusting the position of orifice V by means of the lever N, and, that when it is in the position represented by full lines in Fig. 5, the fluid in A will stand at, or very near to, the line W W; and that when it is in the position indicated by the dotted lines in said figure the fluid will stand at, or near to, the line Y Y. It will also be seen that, by reason of the specified arrangement of the respective parts of this apparatus, a pressure of steam, or gases, within A, will not prevent the flow of fluid thereto; and that the invention is therefore applicable to the feeding of steam boilers, retorts, &c., as well as to open vessels. The inventor has, in fact, contemplated its application to every description of vessels which

require to be so fed as to have a fluid sustained in them at a specified height. 50

I do not wish to confine myself to the form and arrangement of the parts described, further than is necessary to the within described operation, as these may be varied and the same results be produced from the same acting principles. 55

I am fully aware that a chamber having alternate communication, with a vessel above to receive a fluid, and one below to deliver it, has been used before. This device therefore I do not claim irrespective of the improved arrangements herein shown, whereby, I facilitate and regulate the flow of fluid through the same; nor do I claim, broadly, stopping the egress of a fluid from a vessel by stopping the ingress of air or other aeriform bodies thereto, as this is an old device; nor yet do I claim, separately considered, stopping the egress of a fluid from one vessel by the rising of the same in another, as this too is well known, but 60 65 70

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

1. The combination of a chamber having alternate communication, with a reservoir to receive a fluid, and a boiler or other vessel in which to deliver it, causing the fluid, when it rises to the desired height in the latter vessel, to check the passage of air, and other aeriform bodies to the aforesaid chamber, and thereby to regulate automatically the flow of fluid from said chamber, substantially in the manner herein set forth. 75 80

2. I claim the movable pipe L, or its equivalent in combination with the vessel A for the purpose of changing the line at which the fluid is to be sustained in the boiler or vessel A, as herein described. 85

3. I claim the ring D, and the plug O, when constructed, combined, and operated in the manner and for the purpose described. 90

ZALMON L. JACOBS.

Witnesses:

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EBEN. P. PAGE.