

(No Model.)

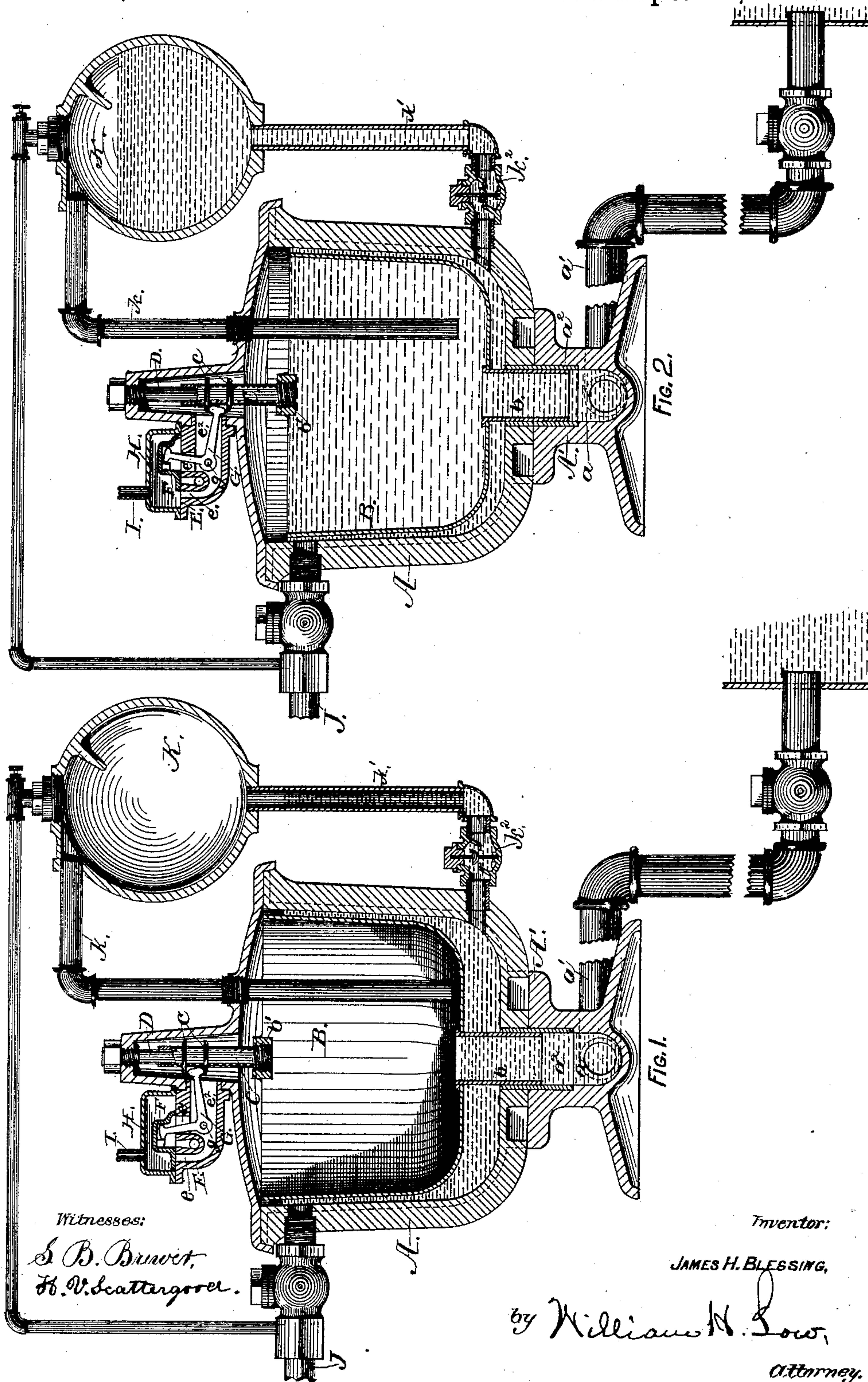
2 Sheets—Sheet 1.

J. H. BLESSING.

STEAM TRAP.

No. 348,948.

Patented Sept. 14, 1886.



Witnesses:

S. B. Brewster,
H. V. Scattergood.

Inventor:

JAMES H. BLESSING,

by William H. Low,

Attorney.

(No Model.)

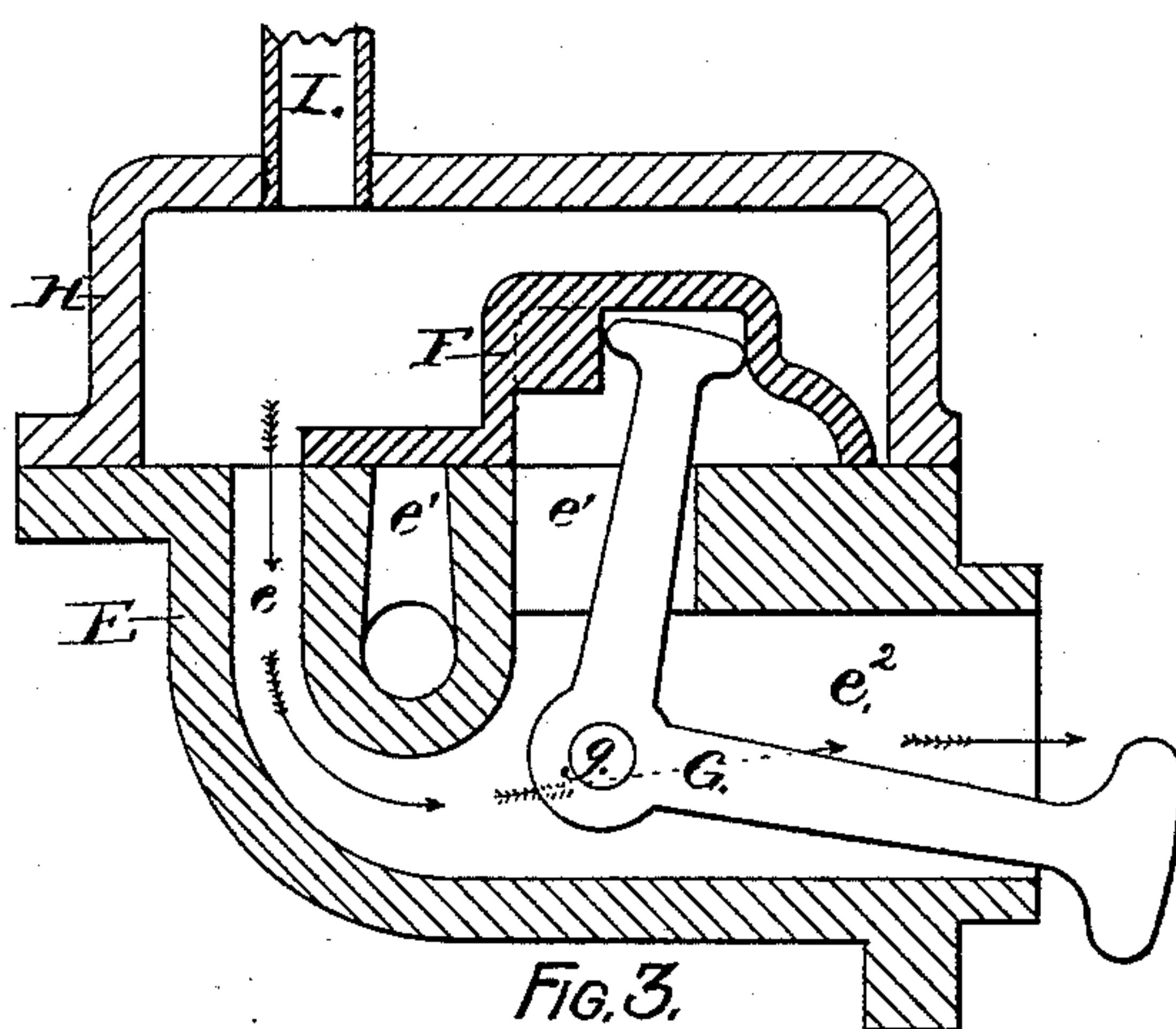
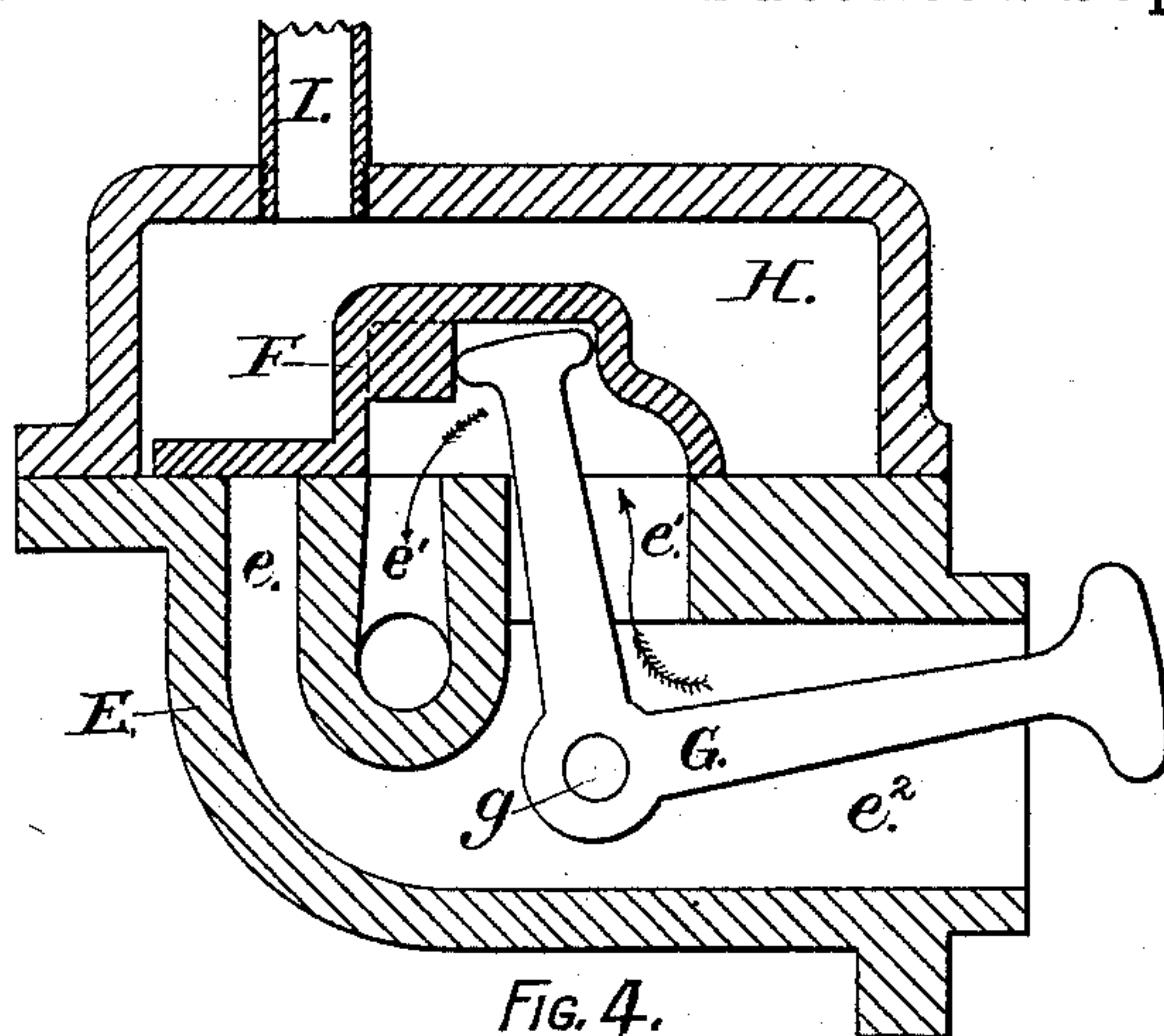
2 Sheets—Sheet 2.

J. H. BLESSING.

STEAM TRAP.

No. 348,948.

Patented Sept. 14, 1886.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES H. BLESSING, OF ALBANY, NEW YORK.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 348,948, dated September 14, 1886.

Application filed July 29, 1886. Serial No. 209,360. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BLESSING, of the city and county of Albany, in the State of New York, have invented new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to improvements on the apparatus for which the following Letters Patent have heretofore been granted me, to wit: No. 207,484, dated August 27, 1878; No. 234,386, dated November 16, 1880; No. 268,384, dated December 5, 1882, and No. 341,548, dated May 11, 1886.

The object of my present invention is to simplify the construction of the apparatus and render it more efficient in its operation; and I attain this object by means of the mechanism illustrated in the accompanying drawings, which are herein referred to, and form part of this specification, and in which—

Figure 1 is a vertical section of my trap with its bucket in a raised position; Fig. 2, a like section with the bucket in its depressed position; and Figs. 3 and 4 are enlarged longitudinal sections of the valve, valve seat, and steam-chest, showing the steam-port and exhaust-port reciprocally opened and closed.

As represented in the drawings, A is the external casing of the trap, in which the bucket B is adapted to reciprocate freely in a vertical direction. Said casing is supported on a pedestal, A', which contains an eduction-passage, a , which connects with the eduction water-pipe a' , and through which the water from the bucket B is conveyed back to the boiler. The eduction-passage a is preferably provided with a bored sleeve, a^2 , so as to form a perfect connection between the casing and pedestal, and to afford a smooth internal surface for properly guiding the lower stem of the bucket.

B is an open-top bucket that is fitted in the casing A so as to leave a small annular space, into which the condensed water from a steam-heating system is delivered. A pendent hollow stem, b , whose opening extends through the bottom of the bucket B, is attached to or formed on the bottom of said bucket, and is fitted to slide with perfect freedom in the sleeve a^2 , or in the bore of the pedestal A'. A cross-bar, b' , is formed across the top of the bucket B, and a hollow stem, C, is erected thereon.

The latter is provided with circumferential collars c , and is fitted to slide freely on a pendent pin, D, which is fixed to the cover of the casing A.

The hollow stems b and C, in addition to their other functions, form guides for the bucket B, so as to maintain it in its required place and position.

E is a valve-seat fixed to the cover of the casing A, and provided with a steam-port, e , and an exhaust-port, e' , the first of which communicates, through the chamber e^2 , with the interior of the casing A. The other opens to the atmosphere, and through it the steam contained in the casing A is permitted to escape when required to produce a reduction of pressure in said casing.

F is a slide-valve fitted to move on the face of the valve-seat E, and adapted to reciprocally close and open the steam-port e and exhaust-port e' .

G is a bell-crank lever, pivoted at g to valve-seat E, and having its short arm fitted to engage through an opening in the valve-seat E in the exhaust-passage of the slide-valve F. The long arm of said bell-crank is adapted to engage between the collars c in such manner that the rising and falling movements of the bucket B will impart the required reciprocations to the slide-valve F—that is to say, the falling movement of the bucket will cause said valve to move to open the steam-port e and close the exhaust-port e' , as shown in Fig. 2, and by the rising movement of said bucket the valve F will be moved to close the steam-port e and open the exhaust-port e' .

H is a steam-chest, which is secured to the valve-seat E to inclose the slide-valve F, and to which the equalizing steam-pipe I from the boiler is connected.

J is an inlet-water pipe, through which the condensed water from the heating-pipes is admitted into the annular space between the casing and bucket, and from thence into the bucket B, as fully set forth in Patent No. 268,384, above referred to.

K is a receiver, which is connected to the casing A by means of the pipes k and k' , the first of which is attached to the upper part of the receiver, and passing through the cover of the casing enters into and extends nearly to the bottom of the bucket B when the latter is

at the most elevated position, as shown in Fig. 1. The pipe k' connects the lower part of the receiver K to the lower part of the casing A, and is provided with a check-valve, k^2 , by which the water in the lower part of said casing is prevented from passing up through the pipe k' into the receiver.

It should be borne in mind that the pressure of steam in the boiler to which my trap is connected is higher than in the steam-heating system, and with that understanding the following description of the operation of my trap will be readily comprehended: The bucket B being empty and at the highest point of its movement, as shown in Fig. 1, the slide-valve F will then be in position to close the steam-port e and to open the exhaust-port e' , thereby opening a communication from the interior of the trap to the atmosphere, and permitting the pressure in the trap to be reduced to or below that in the heating-pipes, and as a consequence the condensed water from the latter will flow into the trap, first filling the annular space around the bucket B, and flowing over the top of said bucket until the inner end of the pipe k becomes sealed by water to prevent the passage of steam thereinto, whereupon the pressure of the steam, acting upon the surface of the water in the bucket B, causes the water to flow through said pipe and fill the receiver K, in which a partial vacuum has been produced by a condensation of steam therein by means of the surrounding atmosphere. The inflow of water into the bucket B continues until the weight of the latter and its contained water overcoming the flotation of the surrounding water causes the bucket to suddenly sink. The valve F is thereby moved to close the exhaust-port e' and open the steam-port e , so as to permit the steam from the boiler to flow into the trap and equalize the pressure in said trap with that of the boiler. By reason of this equalization the water contained in the bucket B will gravitate downwardly, passing through the hollow stem b and pipe a' , and pass into the boiler. When the inner end of the pipe k is sufficiently uncovered, steam from the inside of the trap will pass upward through said pipe into the receiver K and force the water contained in said receiver to flow into the casing A under the bucket B, and thereby said bucket will be suddenly raised to complete its upward movement and restore the several

parts to a condition for the repetition of the operation above described; and this automatic action of the trap will be maintained so long as the pressure of steam and the supply of condensed water continues to flow.

In this improvement the water from the trap is discharged directly through the bottom of the bucket, and I am thereby enabled to dispense with the siphon-pipe formerly used for drawing the water out of the bucket. This greatly simplifies my trap and renders its action more certain and effective. I have also embodied in this construction the use of a single valve for controlling the admission and exhaustion of steam into and out of the trap, and by so doing have rendered the device simpler and less liable to derangement.

I claim as my invention—

1. An automatic steam trap consisting of a close vessel containing a rising and falling bucket having an open top and adapted to discharge its water through the bottom of said bucket, and a single valve actuated by said bucket to reciprocally open and close the steam and exhaust openings, through which the steam is admitted into and exhausted from the interior of said trap, as herein specified.
2. An automatic steam-trap consisting of a close vessel containing an open-top bucket adapted to rise and fall in the closed containing-vessel, the said bucket being provided with a discharge-opening in its bottom, through which the water is discharged directly downward, and a valve mechanism actuated by said bucket, whereby the steam is reciprocally admitted into and exhausted from the closed vessel, as herein specified.
3. In an automatic steam-trap, the combination, with a close containing-vessel provided with a vertical discharge-opening in its pedestal, of a rising and falling open-top bucket provided at its bottom with a pendent hollow stem, which is fitted to slide in the discharge-opening of the containing-vessel, and a valve mechanism actuated by the rising and falling of the bucket and adapted to control the admission of steam into and the exhaustion of steam from the interior of the trap, as herein specified.

JAMES H. BLESSING.

Witnesses:

WM. H. LOW,
S. B. BREWER.