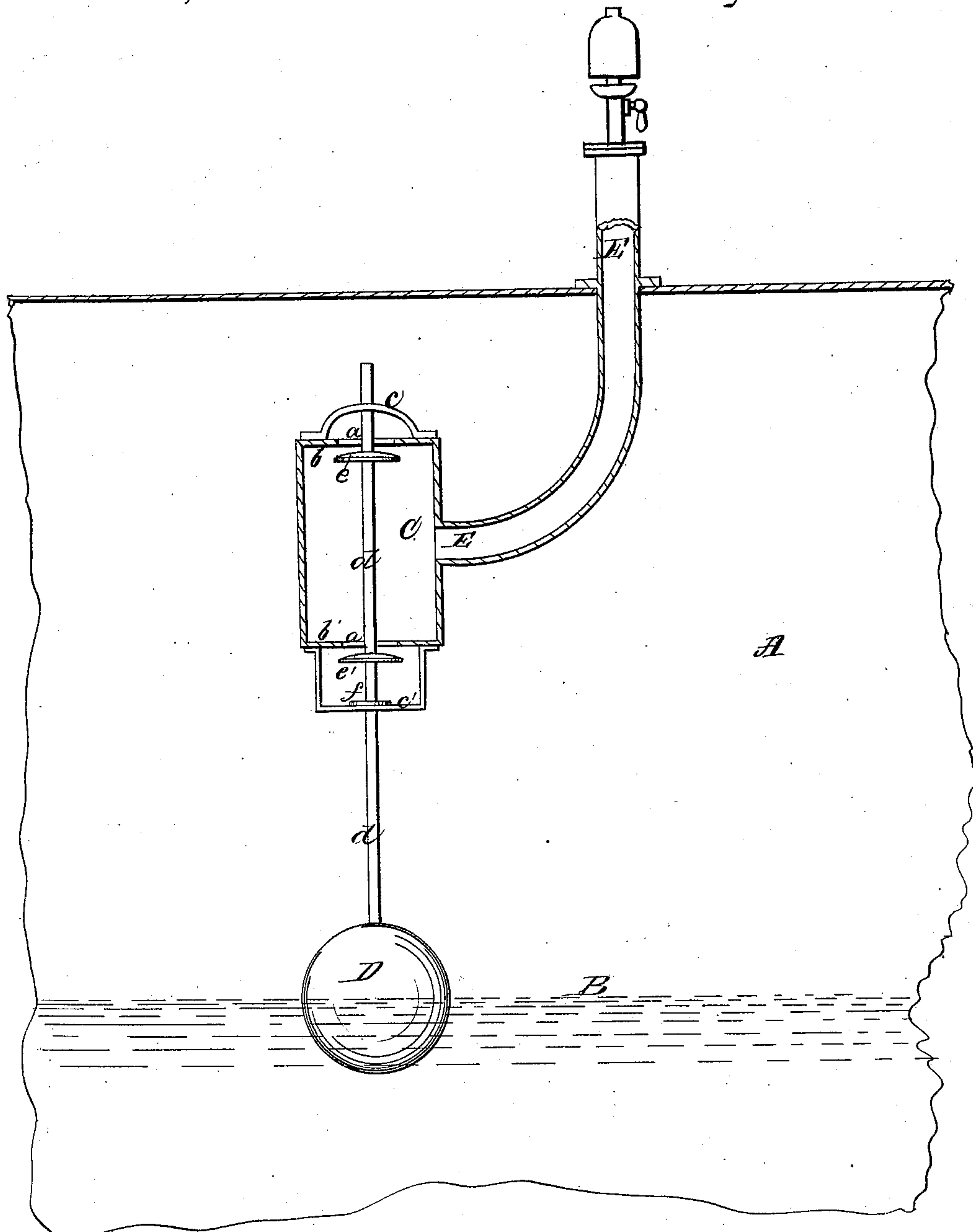


S. Dustin,
Steam-Boiler Indicator.
No 23,761. Patented Apr. 26, 1859.



Witnesses:
A. B. Sloughton
E. Cohen

Inventor:
Selah Dustin

UNITED STATES PATENT OFFICE.

SELAH DUSTIN, OF DETROIT, MICHIGAN.

LOW-WATER ALARM FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. 23,761, dated April 26, 1859; Reissued May 27, 1860, No. 937.

To all whom it may concern:

Be it known that I, SELAH DUSTIN, of Detroit, in the county of Wayne and State of Michigan, have invented certain new and
5 useful improvements in an apparatus for indicating, by an alarm, the height of the water in a steam-boiler when below or above the proper water line or level; and I do hereby declare the following to be a full,
10 clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, which represent a section through a steam-boiler and through the apparatus referred to.

15 I am aware that many devices have been invented for ascertaining when the water in a steam boiler is above or below what is termed the water line, and to give an alarm when it so falls and rises. And I am aware
20 that, among these many devices, which are almost invariably arranged on the outside of the boiler, there has been one at least where a steam cylinder or chamber has been used in the inside of the boiler. But among
25 all those of which I have any knowledge there are none that operate without packing, or without the pressure of the steam upon either the rods or cocks, unless the steam chamber be outside of the boiler.

30 It is one of the conditions of my invention that the steam cylinder or chamber shall be inside of the boiler; and the nature and object of my invention is to cause a steam cylinder or chamber so placed inside of a
35 boiler to be opened to, or closed against, the steam therein, by a pair of valves which are in equilibrio, and are raised and lowered by a float on or near the surface of the water in the boiler, by which means I avoid all
40 pressure against the valves except that derived from the float, and avoid also all packed joints, which are so uncertain in their operation.

45 If a chamber, valve, or cock is operated with the pressure of the steam upon it, which may be 15 pounds to the square inch, or it may be at another time 100 pounds to the square inch, such chamber valve or cock,
50 with the constantly varying pressure upon it cannot always and with certainty indicate the height of water in the boiler. Much less can they do so when in addition to this constantly varying and sometimes very heavy pressure, they have also to overcome the re-
55 sistance of a packed rod, or joint which is

constantly liable to get clogged or stuck fast. Where the resistance is constantly varying, a float cannot always at the same position overcome that resistance. In my construction I have no steam pressure to compen-
60 sate for, and have no packed rod or joint, and hence I have not the resistance and friction to contend against which must seriously effect the action of the indicators which do have the pressure and friction upon them. 65

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A, represents a portion of a boiler, in 70 which the water line may be at B.

C, is a cylinder inside of the boiler which is entirely closed, except the two openings *a*, *a'*, one in each of its heads *b*, *b'*. On these heads may be placed guides *c*, *c'*, 75 through which a rod *d*, may play, and be kept in a vertical position. This rod *d*, carries two valves *e* *e'* the upper one being inside of the cylinder C, and closing upward against the opening *a*, while the lower 80 one is below the cylinder and closes against the opening *a'*, in the lower head *b'*. On the lower end of this rod *d*, there is a ball or float D, that always follows the surface of the water in the boiler. 85

From the cylinder C, there extends a steam pipe E, which passes out through the crown of the boiler and may have upon its upper and outer end a steam whistle (as shown in red lines) or any other signal 90 to indicate when there is an open steam passage through the cylinder C, and pipe E.

Now it is obvious that however great the pressure may be in the boiler it bears equally over all parts of the cylinder C, as well 95 as its valves *e*, *e'*, and they will open as easily as they would in a vacuum. When the water gets lower in the boiler than the proper line, the float D follows it, and thus opens the valves *e* *e'*, which allows the steam 100 to pass out and blow the whistle or sound an alarm. The pumps being started or water furnished to the boiler, the float will rise, and carry up the valves against the cylinder heads, and thus close the spaces, 105 and stop the issue of steam, and the alarm and thus show that the regular quantity of water is in the boiler. It is obvious that the rod *d*, may, instead of being straight and vertical, be curved or bent in the form 110

of a lever, and still operate the two valves—the main object being to so arrange the valves inside of the boiler, as that there shall be no pressure against them (practically), and no packed joints, thus causing the slightest deviation of the float, or water line below a given point to open said valves.

f, is a collar or stop on the rod *d*, to prevent the ball or float from descending too far below the point that opens the valves. This contrivance indicates, or signals, when the water is too low in the boiler. Now it is obvious that, by simply reversing the contrivance or turning it upside down it may in the same manner be made to indicate when a sufficient height of water is in the boiler—and one may thus sound the alarm when the supply is insufficient, and the other sound the alarm when the supply is had—and either of these contrivances may be connected with mechanism that will supply the water, or cut off the supply when the quantity is furnished.

Having thus fully described the nature and object of my invention, and in what particulars it differs from other contrivances for a similar purpose, what I claim therein as new, and desire to secure by Letters Patent is—

In combination with a steam cylinder located inside of a steam boiler, and having two openings in it, a float and rod carrying or operating two valves, in equilibrio, and having no packed joints, substantially as described, by which means I avoid all undue pressure and friction, and render the float more sensitive to any variation of the height of the water in the boiler and thus obtain a more reliable indication, or signal than by any of the heretofore essayed plans, as set forth.

SELAH DUSTIN.

Witnesses:

A. B. STOUGHTON,
E. COHEN.