

No. 755,875.

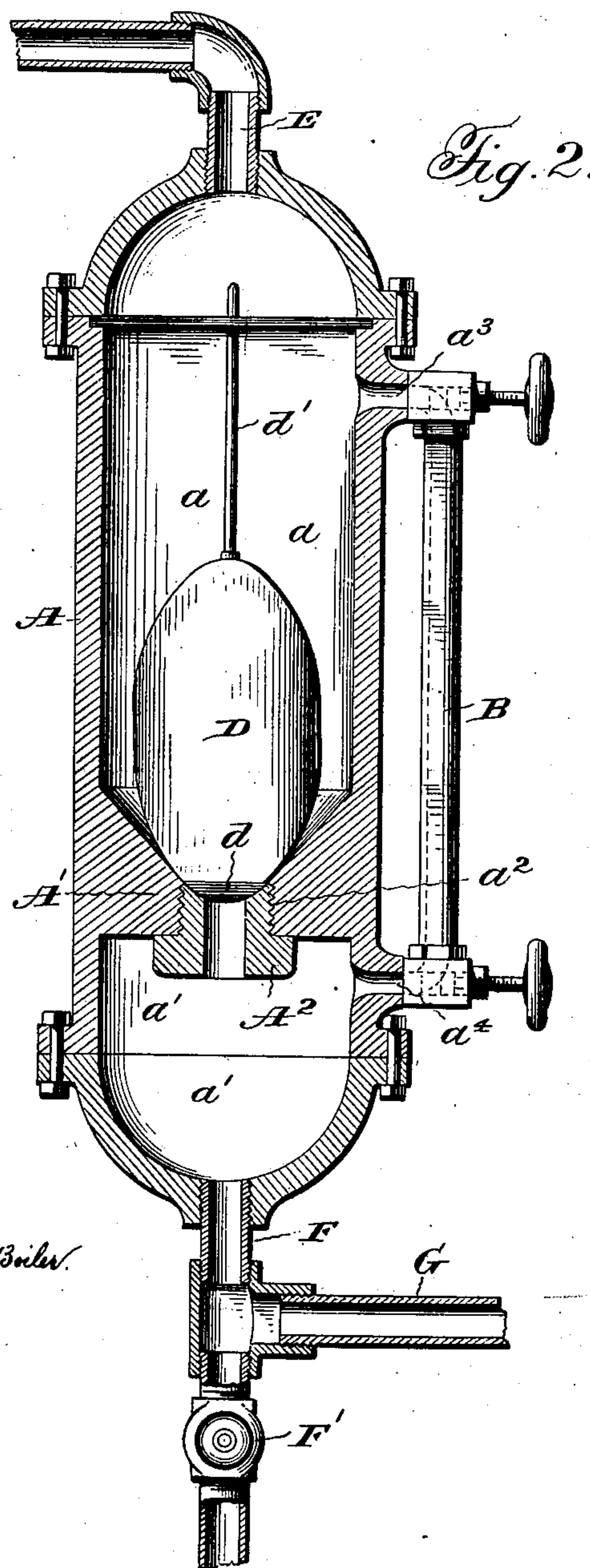
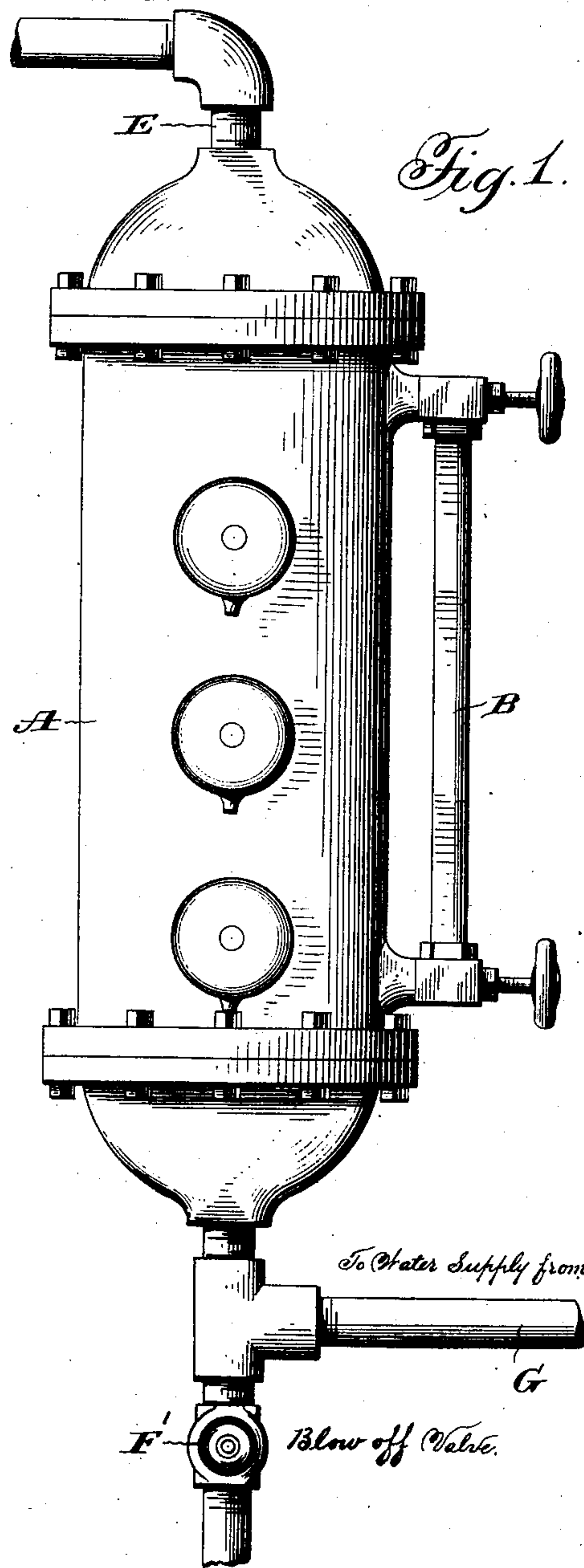
PATENTED MAR. 29, 1904.

G. H. HOLLAND.
WATER COLUMN FOR STEAM BOILERS.

APPLICATION FILED MAY 4, 1903.

NO MODEL.

To Steam Dome.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE H. HOLLAND, OF SPRINGFIELD, ILLINOIS.

WATER-COLUMN FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 755,875, dated March 29, 1904.

Application filed May 4, 1903. Serial No. 155,569. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HOLLAND, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Water-Columns for Steam-Boilers, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

My invention relates to apparatus for reliably indicating the stage of water in a steam-boiler.

The purpose of my invention is to provide means whereby the steam-pressure of the boiler may be utilized to simultaneously cleanse the water-glass and the water-supply pipe without waste of steam.

With this end in view my invention consists of the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made, and hereinafter particularly described and finally recited in the claims.

Referring to the drawings, Figure 1 is a side elevation of the complete apparatus, and Fig. 2 is a vertical axial section.

Similar reference-letters designate like parts in both of the views.

The steam and water receptacle preferably consists of a cylinder A, of cast-iron, having a diaphragm A' extending across the interior of the cylinder and separating an upper chamber *a* from a lower chamber *a'*. A receptacle of any other suitable form or material may be used. A central screw-threaded opening *a*² extends through the diaphragm. The upper surface of the diaphragm is made concave, so as to guide the float into position on its seat. An annular screw-threaded valve-seat A², having its upper end tapered to accurately fit the lower end of the float D, screws into the opening *a*² from the under side of the diaphragm. An opening *a*³ intercommunicates between the chamber *a* and the upper end of the water-glass B, and a similar opening *a*⁴ intercommunicates between the chamber *a'* and the lower end of the water-glass.

The float D, preferably of sheet-copper, has at its lower end a reinforcement *d*, fitting in

the tapering upper end of the seat A², and an axial stem *d'* slidable in a central guide.

A pipe E intercommunicates between the chamber *a* and the live-steam space in the boiler above the water-line.

A pipe F opens into the chamber *a'*.

A valve F' in the pipe F serves to control the flow of water through pipe into the chamber *a'* or from the chamber out through the pipe, as hereinafter explained.

A pipe G intercommunicates between the pipe F and the water-space of the interior of the boiler.

In practice it is found that in apparatus of this kind the surfaces or parts exposed to live steam are less subject to rust and consequent clogging than are the surfaces of parts which are in contact with or immersed in the water, and that for this reason and also by reason of the settling of sediment clogging most frequently occurs in the lower parts of the apparatus—such, for example, as in the inner end of the opening *a*⁴ and the juncture of the pipe G with the pipe F. The obstruction of the pipe G or the openings *a*³ and *a*⁴ is very dangerous, because if that occurs the circulation of water and steam through the cylinder and the water-glass is stopped, and the effectiveness and reliability of the apparatus is thereby destroyed. The scale and sediment which accumulates in the opening *a*⁴ and the pipe G is deposited in layers, which are usually somewhat thicker at the extreme inner end of the opening or the pipe than they are farther along in the opening or pipe. From the foregoing it will be seen that cleaning of the opening can be best effected by live steam passing through the opening into the chamber *a'*, since pressure in that direction will force scale and sediment out of the opening into the chamber, whence it may be discharged through the blow-off pipe, and the cleansing of the pipe G may be advantageously effected by live steam passing through the chamber *a'* into the pipe F in conjunction with water flowing through the pipe G, backed by the steam-pressure on the water in the boiler.

The operation of the apparatus is as follows: The apparatus being properly connected with the boiler and the valve F' being closed, water

from the boiler will flow through the pipe G into the lower chamber a' and thence through the central opening through the valve-seat A^2 into the upper chamber a , lifting the float D until the water in the chamber a stands at the same level as the water in the boiler. Water will also flow through the opening a^4 into the water-glass B, and steam from the chamber a will flow through the opening a^3 into the water-glass until complete equilibrium is attained and the level of water in the water-glass is exactly the same as the level of the water in the boiler and the upper chamber a .

When it is desired to test or to cleanse the water-column, it is only necessary to open the valve F' . When the valve F' is opened, the water contained in the glass B and the chambers a and a' flows out through the pipe F. As the water flows out from the upper chamber a the float descends until it rests on the seat A^2 , and the steam-pressure on the float keeps it in position on the seat, so as to shut off communication between the chambers a and a' . Steam will then pass through the opening a^3 down through the water-glass, thence through the opening a^4 into the chamber a' , and thence out through the pipe F, and water under steam-pressure will pass through the pipe G out through the pipe F. This circuit of the steam and water serves to thoroughly cleanse the water-glass, the pipes G and F, and the opening a^4 .

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, the combination of a receptacle having intercommunicating chambers separated by a diaphragm, means for supplying steam from a boiler to said receptacle, means for supplying water from the same boiler to said receptacle,

a water-glass intercommunicating with said chambers, means for intercepting communication through the diaphragm separating said chambers, and means for discharging the contents of said receptacle, as set forth. 45

2. In an apparatus of the class described, the combination of a receptacle having an intermediate diaphragm provided with an upper concave surface, a central valve-seat in said diaphragm, a centrally-guided float seating on said valve-seat, a water-glass intercommunicating with said receptacle on both sides of said diaphragm, means for supplying steam from a boiler to said receptacle on one side of said diaphragm, means for supplying water from the same boiler to said receptacle on the other side of said diaphragm, and means for discharging the contents of said receptacle, as set forth. 50 55 60

3. In an apparatus of the class described, the combination of a cylinder, a diaphragm intermediate to said cylinder, a valve-seat in said diaphragm, a centrally-guided float seating on said seat, a water-glass communicating with said cylinder above and below said diaphragm, a steam-pipe communicating with said cylinder on one side of said diaphragm, an outlet-pipe communicating with said cylinder on the other side of said diaphragm, a valve in said outlet-pipe, and a water-supply pipe communicating with said outlet-pipe between said valve and said cylinder, as set forth. 65 70

In witness whereof I have hereunto subscribed my name, at Springfield, Illinois, this 16th day of April, 1903. 75

GEORGE H. HOLLAND.

Witnesses:

W. J. AURELIUS,
JESSIE NETTLETON.