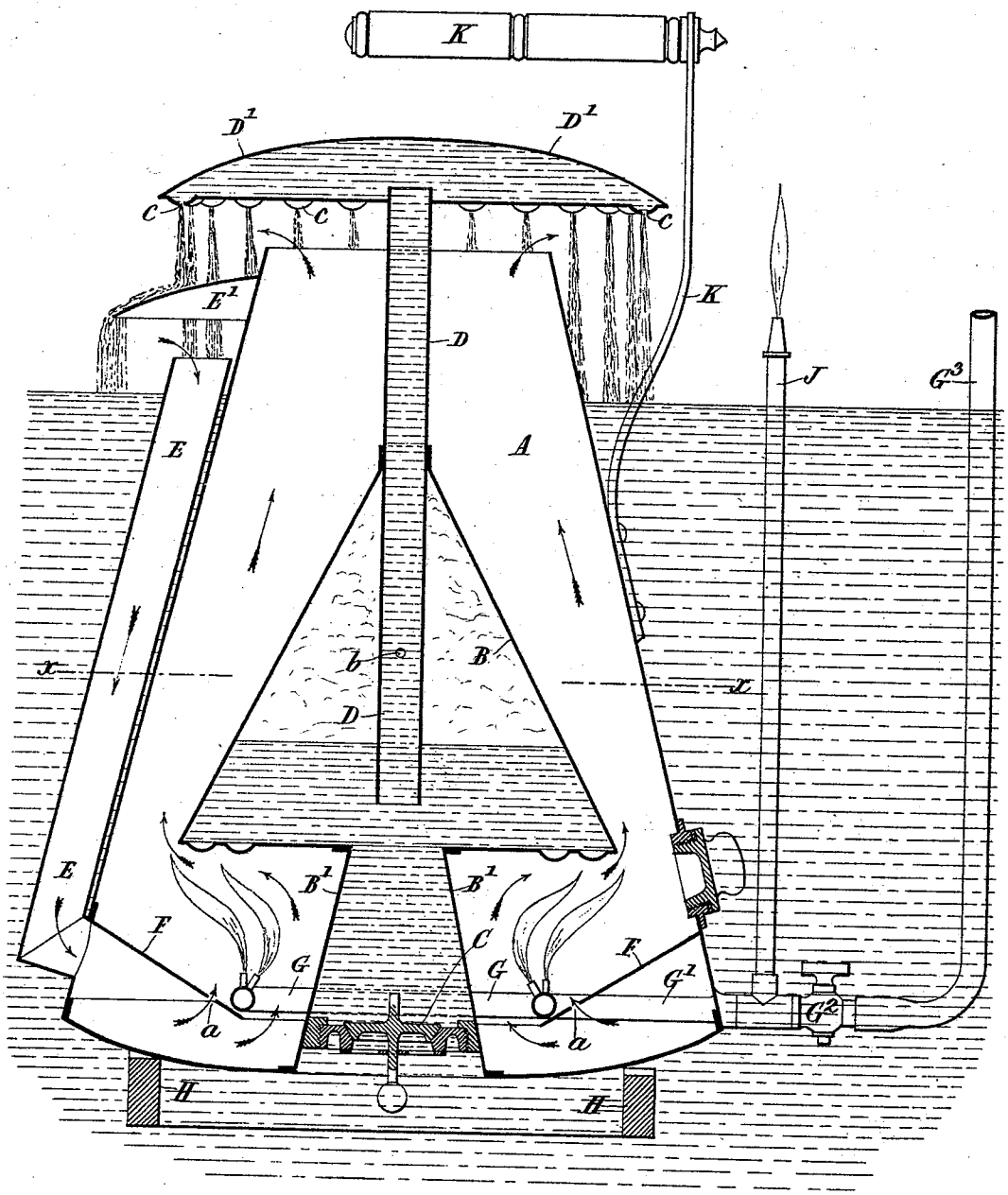
(No Model.) 2 Sheets—Sheet 1.

D. W. SUGG.

BATH WATER HEATER.

No. 499,403. Patented June 13, 1893.

Fig. 1



Witnesses:-
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Arthur Greenland.

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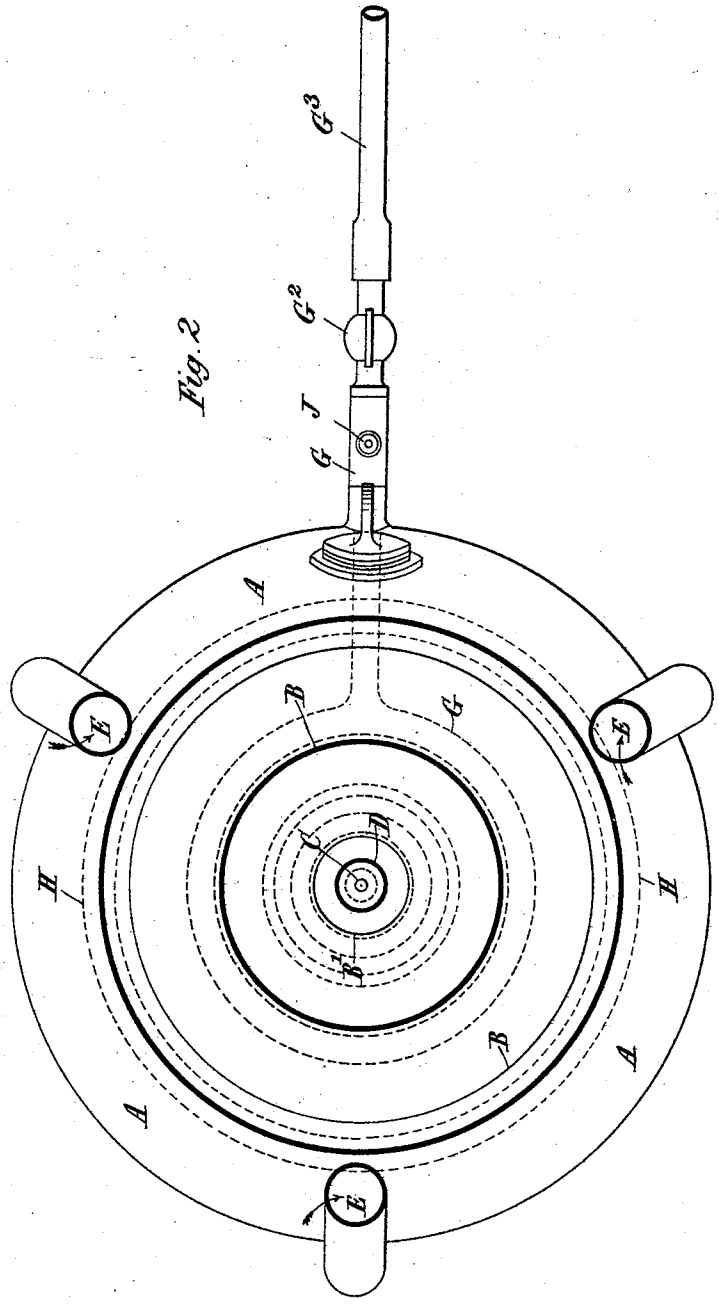
(No Model.) 2 Sheets—Sheet 2.

D. W. SUGG.

BATH WATER HEATER.

No. 499,403. Patented June 13, 1893.

Fig. 2



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UNITED STATES PATENT OFFICE.

DAVID W. SUGG, OF LONDON, ENGLAND.

BATH WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 499,403, dated June 13, 1893.

Application filed October 5, 1892. Serial No. 447,934. (No model.)

To all whom it may concern:

Be it known that I, DAVID WILLIAM SUGG, engineer, of Vincent Street, in the city of Westminster, London, England, have invented a certain new, useful, and Improved Bath Water-Heater, of which the following is a specification.

The object of this invention is to produce a portable heater to heat water for a bath, and the invention consists in a simple apparatus to be placed in the water in the bath, and heated by gas (or, it may be, an oil lamp), and so arranged that a more or less continuous circulation of the water is kept up, whereby the water in the bath gradually becomes hot.

The apparatus is designed to float in the water when the depth of water is sufficient, but it will also act resting on the bottom of the bath, provided the water reaches at least half way up the apparatus, but the effect is not so satisfactory as when the apparatus is immersed to the line of flotation, as a greater or less loss of heat results.

In the accompanying drawings, Figure 1 is a sectional elevation of the apparatus as it would appear in use; and Fig. 2 is a transverse section on the line *x. x.* of Fig. 1.

A is a conical shaped vessel which serves as the heating chamber.

B is a conical boiler supported centrally of the vessel A. by a tube B′., which is open both to the boiler and the exterior of the vessel A. and which constitutes an inlet for feeding the boiler with water. In this tube B′. is placed a counter-weighted valve C. Descending nearly to the bottom of the boiler B, is an upcast pipe D, provided at top with a water diffuser D′., so formed as to prevent the entrance of water to the open top of the heating chamber A, during the working of the apparatus.

E are air tubes which are connected with the bottom of the vessel A. and extend upward above the line of flotation, and E′. are deflectors placed over the openings of the air tubes to prevent the entrance of water.

F is a conical deflector arranged inside the vessel A, and above the air inlets, to deflect the greater portion of the air supply to the inside of the gas ring G, so as to give the proper direction to the gas flames, and prevent them striking the bottom of the boiler and smoking. A certain amount of air will be allowed to pass to the outer side of the flames through the holes *a. a.* in the deflector F.

The permanent line of flotation is regulated by a weighted ring H, secured to the bottom of the vessel A, which ring serves also as a stand for the apparatus, when out of use.

G′. is the pipe to supply gas to the ring G, and this pipe, which is provided with a cock G^2., is connected with the gas supply by a flexible pipe G^3. Extending upward from the pipe G′., above the line of flotation, is a pipe to a test jet J.

K is a handle for carrying the apparatus.

The action of the apparatus is as follows:—The bath (or, it may be simply a large pail) having been filled with water to the requisite height, the apparatus is placed therein. The valve C. will open under the pressure of the water, and allow the water to flow into the boiler, the height of the water therein being regulated by the hole *b.* in one side of the pipe D, the position of which must be such as to retain a certain amount of air in the boiler. The gas is then lighted, and the water in the boiler gradually comes to the boil. As the water continues to boil, steam will collect in the air space, and the pressure will gradually accumulate until it reaches a certain point, when it forces the hot water up the pipe D, and into the diffuser, from which it escapes by the openings *c*, as shown in the drawings. When the water descends below the end of the pipe D, a certain part of the steam will escape, and the pressure being thus reduced, cold water will rush in through the valve C, to refill the boiler, the contact with the cold water condensing the steam remaining in the boiler, and producing a vacuum, which has to be filled by the water under the influence of the pressure of the external air. The operation then proceeds as before, the steam collecting and forcing out the water,—the rapidity of the circulation being dependent upon the position and size of the hole *b* in the tube D, and the sensitiveness of the valve C. The heat from the flames also acts on the sides of the vessel A, which communicates heat to the surrounding water, and thus the heat of the flame is utilized to the utmost possible extent.

It is of course obvious that wherever coal gas luminous flames are used, carbonic acid gas is given off, and which, in extremely cold weather, is liable to hang about the surface of the water in the bath. For the purpose of testing whether such is the case, and also for the purpose of keeping the surrounding air in motion, I have provided the test jet J. This test jet will, under certain circumstances, also serve to light the apartment while the bath is preparing.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A water heater for bath and other purposes, consisting of a floatable vessel to be placed in the water, and containing a boiler; means for applying heat thereto; an automatic valve in the bottom of the boiler; an upcast pipe descending nearly to the bottom of the boiler, and having at top a water diffuser; air inlet pipes, and a counter-weight, all combined, arranged, and operating as set forth.

2. In a water heater for bath and other purposes, the combination with a boiler having an opening in its bottom, of an up-cast pipe D having an opening *b* in its side and descending nearly to the bottom of the boiler, and an automatic inlet valve in said opening in the bottom of the boiler, as and for the purpose herein set forth.

3. In a water heater for bath and other purposes, the combination with a boiler having a feed inlet in its bottom and an outlet through which water is to be expelled by the pressure of the steam, of an automatic upwardly-opening valve in said feed inlet, substantially as herein set forth.

DAVID W. SUGG.

Witnesses:
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