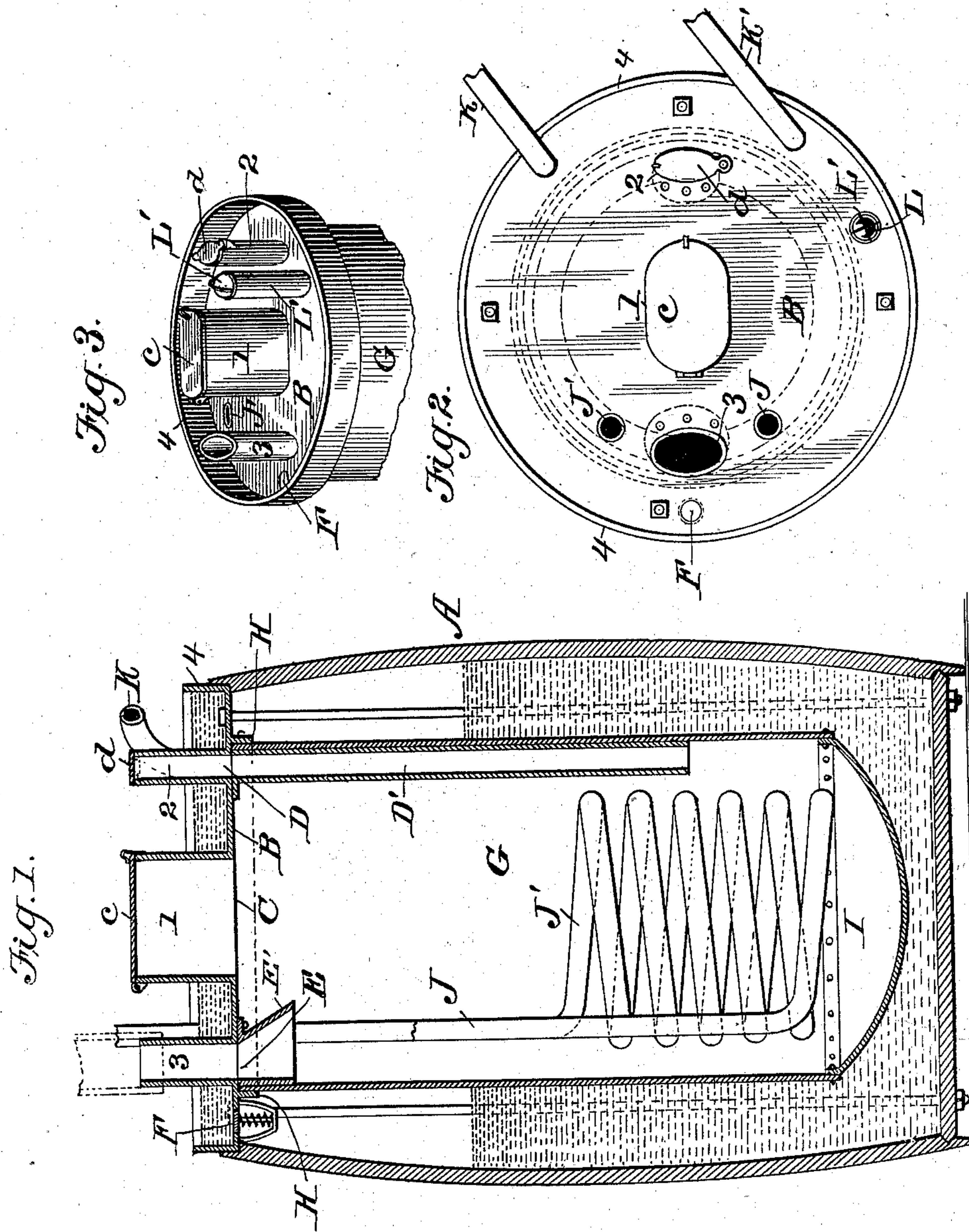


(No Model.)

T. F. BUTTERFIELD.
STEAM GENERATOR AND TANK HEATER.

No. 559,259.

Patented Apr. 28, 1896.



WITNESSES:

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THOMAS F. BUTTERFIELD, OF DE WITT, IOWA.

STEAM-GENERATOR AND TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 559,259, dated April 28, 1896.

Application filed December 1, 1894. Serial No. 530,581. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. BUTTERFIELD, of De Witt, in the county of Clinton and State of Iowa, have invented a new and useful Improvement in Steam-Generators and Tank-Heaters, of which the following is a specification.

My invention is an improved steam-generator and tank-heater; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described, and pointed out in the claim.

In the drawings, Figure 1 is a vertical longitudinal section of my improved steam-generator. Fig. 2 is a top plan view. Fig. 3 is a perspective view of the head.

The present invention is an improvement upon my former patent, No. 196,559, dated October 30, 1877, this invention seeking to provide a novel construction of the head or cap and to furnish a heating-pipe construction by which to increase the water-heating capacity of the apparatus.

As shown in Fig. 1, the apparatus includes a tank or boiler A, which for ordinary agricultural purposes may be an ordinary cask or barrel—such as a kerosene or whisky barrel—and needs no special description herein.

The head B is fitted in the mouth of the boiler A and may be secured in place by stay-bolts, as shown, or in other suitable manner. This cap or head is preferably cast, and has integral with it the upwardly-projected tubular portions 1, 2, and 3, surrounding and guarding respectively the fire-opening C, the air-opening D, and the smoke-outlet E. The air-opening is controlled by a damper *d* at the top of the tubular projection 2, and a fire-door *c* is provided at the upper end of the tubular projection 1. These tubular projections are important, in connection with an outer or rim projection 4, as they permit the entire top surface of the cap to be covered with water to prevent any undue heating of such cap, and when the water upon the top is heated it may be admitted to the interior of the boiler. For this purpose I provide the cap B with a valve-controlled opening F, through which the water may enter the boiler when the valve is opened, which may be by depressing such valve by a rod or in other suitable manner, and fresh

water may be supplied to the top of the cap. The head-plate or cap has an integral upwardly-projected rim-flange 4.

Below the cap I provide, in communication with the air-opening D, a downwardly-extended air-pipe D', which, together with the tubular projection 2, furnishes air to support combustion in the heating or fire chamber G, which chamber is riveted or otherwise secured to a depending flange H upon the under side of the head-plate. This fire-chamber has a separate bottom-piece I fitting within and riveted to the tubular main portion or body, as shown most clearly in Fig. 1.

A funnel-like smoke-guide E' is secured to the under side of the head surrounding the smoke-outlet and depending within the fire-chamber and serving to collect and direct the smoke outward. A pipe J extends into and is coiled at J' within the fire-chamber. As shown in Fig. 2, the pipe extends both to and from the coil from without the fire-chamber, passing at both ends through the head-plate; but manifestly one or both ends of the pipe may extend through the walls of the fire-chamber and open into the boiler.

In practice a fire is built within the fire-chamber, and a suitable grate may be provided near the bottom of said chamber, if desired.

It will be understood that in the use of the invention as a boiler, as shown in Fig. 1, the water may be supplied through a pipe K and the hot water or steam conducted off through another pipe K'.

When the improvement is used as a tank-heater, the heating-chamber is sunk in the tank until the water in such tank rises above the top of the fire-chamber and alongside the rim-flange of the head, so that the entire heat from the fire-chamber will be utilized to heat the water in the tank.

A safety-valve is provided, comprising a ball L, seated in the tubular projection L' upon the head-plate.

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

A portable tank-heater substantially as described comprising the head-plate or cap forming the tank-top and having an integral up-

wardly-projecting rim-flange, an integral de-
pending flange, and provided with the air and
fuel inlets, and the smoke-outlet and with up-
wardly-extending tubes above the fuel-inlet
5 and smoke-outlet and with the funnel lead-
ing to the outlet below the cap and the fire-
chamber or furnace secured to the depending

flange of the cap all substantially as described
and for the purpose set forth.

THOMAS F. BUTTERFIELD.

Witnesses:

E. J. QUIGLEY,
GEO. A. ROBB.