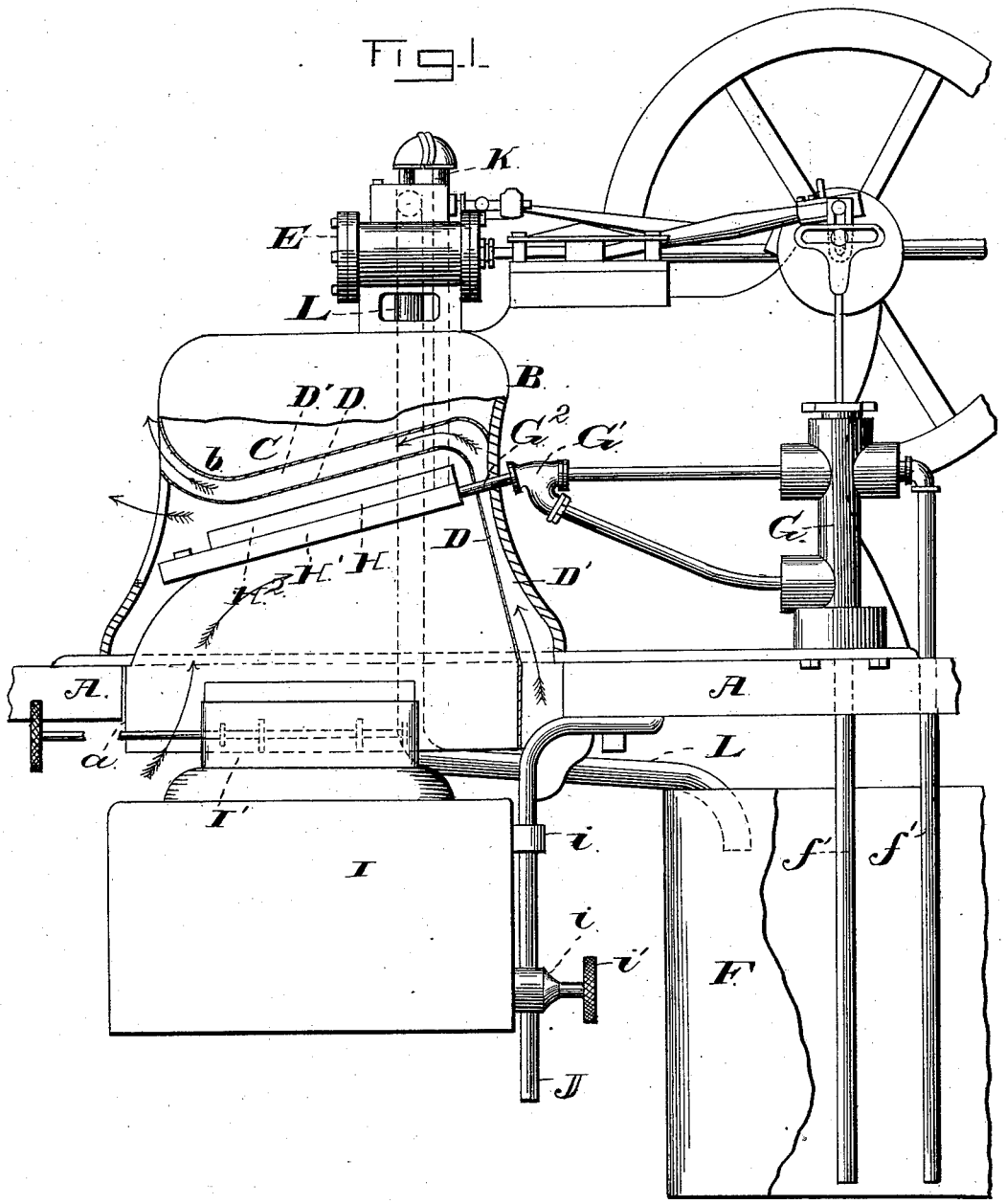
(No Model.) 2 Sheets—Sheet 1.

J. P. FORBES.

STEAM GENERATOR.

No. 305,300. Patented Sept. 16, 1884.

Fig. 1.



WITNESSES:
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

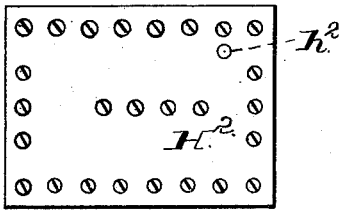


Fig. 4.

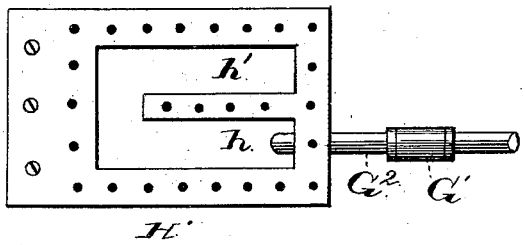
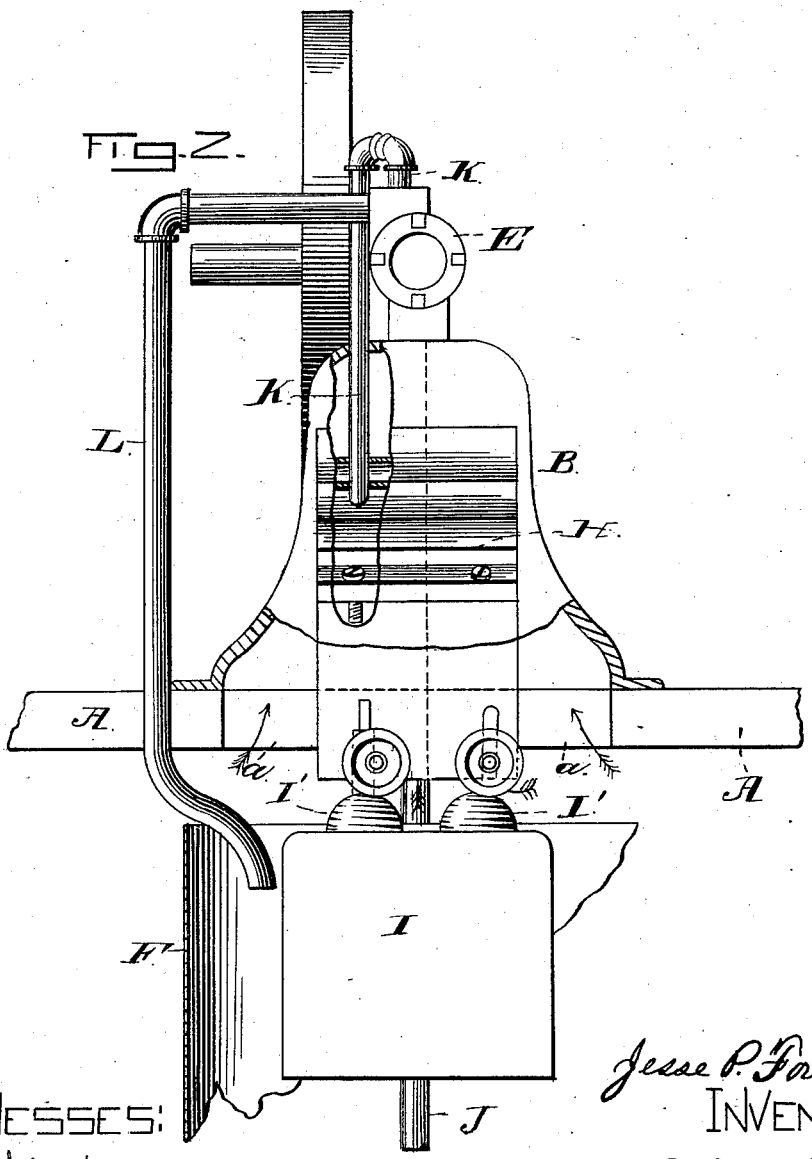


Fig. 2.



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UNITED STATES PATENT OFFICE.

JESSE P. FORBES, OF COSHOCTON, OHIO.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 305,300, dated September 16, 1884.

Application filed June 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, JESSE P. FORBES, a citizen of the United States, residing at Coshocton, in the county of Coshocton and State of Ohio, have invented certain new and useful Improvements in Steam-Generators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to steam-engines; and it consists in the novel construction of the generator, and in other improvements, as will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view, and Fig. 2 an end view, of my engine, the casing in both views being partially broken away to show the interior arrangement. Fig. 3 is a detail view of the top plate; Fig. 4, a detail view of the bottom plate of the generator, all of which will be described.

The support A represents the floor of the engine-house or other suitable base-plate, and has formed through it an opening, *a*, through which the lamps communicate with the generator. The support may be varied without departing from my invention.

The standard B is preferably made of a hollow casting, and may be enlarged so as to contain the lamps, having an open bottom rested over the opening *a* and divided near its top by a transverse partition, *b*, which serves as the upper wall of the cooling-flue, presently described. This partition also forms the air-chamber C, below the top of the standard, which co-operates with the cooling-flue to prevent the top of the standard and the cylinders mounted thereon from becoming overheated by the action of the lamps, hereinafter described.

A plate, D, forming the rear side and top of the lamp-hood, extends up within the casting and near the rear side thereof, and thence extends forward under the plate *b*, between which plate and the inner face of the casting it forms the cooling-flue D′, which opens at its bottom into the fresh air, and discharges at its upper end at the outer or rear edge of the casting.

The cylinder E is mounted on the standard, and the main shaft, slides, &c., may be suitably supported in any desired manner in proper relative position, about as shown.

A water reservoir or tank, F, is arranged, preferably, below the base or plate A, and is connected with pump G by pipes *f′ f′*.

The pump is operated by connection with the main shaft of the engine, and has connecting-pipes which are joined to a fitting, G′, from which a pipe, G^2, delivers the water into the generator, presently described. I provide the fitting with a check-valve to prevent back-pressure on the pump in the operation of the device.

Within the standard and below the horizontal portion of the cooling-flue, I arrange the generator H, the outer end of which is about flush with the bottom of an opening, A′, formed in the end of the standard, and it inclines thence upward, as shown, its bottom face forming an incline, or may be placed horizontally without departing from my invention, which directs the heat of the lamps up along its entire bottom face, thus securing a better action of same, as will be understood. After passing up under the generator the heat passes along over same and out at the upper side of opening A′, as indicated by the arrow. The cool air circulating upward through its flues serves, as before stated, to prevent the over or injurious heating of the cylinder. The specific construction of the generator will be more fully described hereinafter.

The lamp I is arranged below the base A and under the generator, and has lateral eyes *i i*, which slide on a rod, J, depending from the base; and a set-screw, *i′*, turning through one of the eyes against said rod, enables the clamping of the lamp at any desired point on or its removal from the rod, to facilitate its refilling or trimming of the wicks. I provide this lamp preferably with two burners, I′, arranged side by side, and having suitable wick-raising shafts, as is usual. It is also preferred to provide for said burners separate chambers, in which the heat from each is conducted to and against the bottom of the generator, and directed directly against the same

on opposite side of the medial line of the generating-chamber, as will be understood from Figs. 2 and 4, in connection with the description hereinafter given. These chambers are formed, preferably, in the hood, of which the plate D forms the back and top.

In constructing my generator I have had in view simplicity of construction and great strength. The generating-chamber is formed of two wings, $h\,h'$, separate at their forward ends and for the greater part of their length, and connected together at their rear ends, forming substantially a U-shaped chamber. At the inner end of the wing h, I form a water-inlet opening, through which the pipe G^2 delivers water in the operation of the invention. The pipe G^2 is connected with the water-supply in the present case through the medium of the fitting G′ and connecting-pipes before described.

The generator is preferably constructed of the plate H′ and the plate H^2. The plate H′ has the chamber $h\,h'$ formed in its inner face, and is provided with bolt-holes surrounding said chamber, and extends between the wings thereof, and the plate H^2 is placed on said plate H′, and is provided with bolt-holes registering with those in the said plate, and bolts are passed therethrough, and secure the two plates together at their edges and along between the wings of the generating-chamber, so that said parts are securely held and a firm, secure structure is had. The steam-pipe K is connected at one end with the inner end of wing h^2, and is extended thence to and opens properly into the steam-chest. I prefer to connect this steam-pipe with the generator through the hole j, formed through plate H^2. A pipe, L, is suitably arranged and connected to deliver the exhaust from the cylinder into the tank.

In operation the pump forces at each stroke of the engine a slight quantity of water into the generator, which is at once flashed into steam, and passes to the engine through the medium before described. It will be noticed that both wings of the generating-chamber are heated, and that the water is flashed into steam at the inner end of one and passes thence at the other in the form of steam, and is superheated in the second wing, adding to its force and enabling the proper operation of the engine with less steam, as will appear. By separating the heat-passage to the generator, it will be seen, the flashing wing may be heated and the superheating wing cut off from heat when for any reason it is not desired to superheat the steam, as will be understood.

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

1. The herein-described steam-generator, consisting of two plates bolted together, and having the generating-chamber formed between them, and composed of two wings connected together at their outer ends, and having a water-inlet at the inner end of one wing and a steam-outlet at the inner end of the other wing, substantially as set forth.

2. The herein-described steam-generator, consisting of the main plate, having formed in its inner face the double-winged generating-chamber, and provided with bolt-holes around said chamber and between the wings thereof, and the covering-plate placed on the main plate, and having corresponding bolt-holes, and the fastening-bolt passed through said holes, the said generator being provided with a water-inlet at the inner end of one of said wings and a steam-discharge at the inner end of the other wing, substantially as set forth.

3. The combination, with a steam-generator having its generating-chamber formed with horizontally-disposed divided wings connected together, and provided with a water-inlet and steam-discharge, arranged one at the inner end of each wing, of the lamp having a burner corresponding to and arranged below the said wings, and a division-plate arranged between the burners and extended from the lamp to the under side of the generator, whereby the action of each lamp may be confined to the wing under which it is arranged, substantially as set forth.

4. The combination of the hollow stand, the generator arranged therein, and the heater arranged below the generator, the said stand being provided with a cooling or air flue extended above the generator, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JESSE P. FORBES.

Witnesses:
FRANK C. HAY,
W. W. BOSTWICK.