(No Model.)

J. E. TAYLOR.

STEAM GENERATOR.

No. 345,333. Patented July 13, 1886.

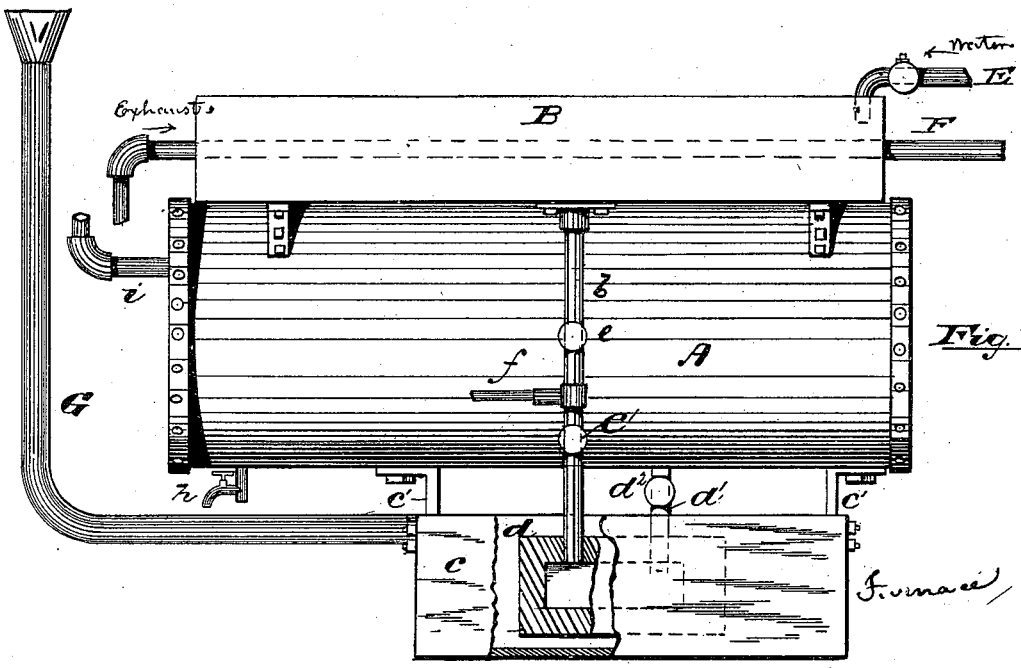

Fig. 1.

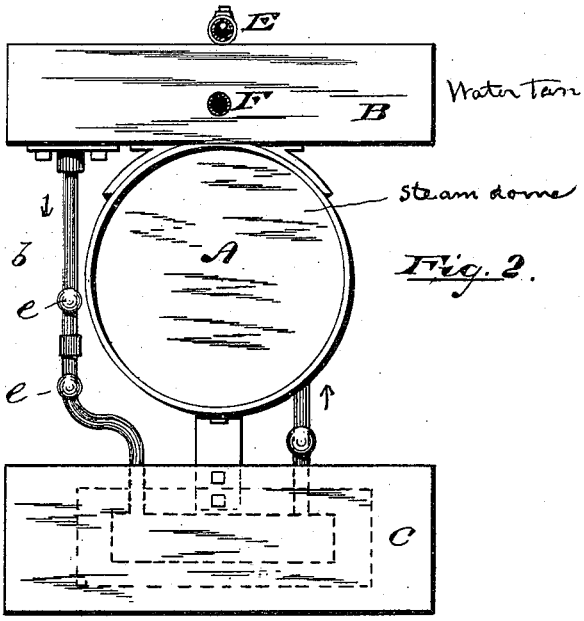

Fig. 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN EZRA TAYLOR, OF WALLA WALLA, WASHINGTON TERRITORY.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 345,333, dated July 13, 1886.

Application filed October 6, 1885. Serial No. 179,130. (No model.)

To all whom it may concern:

Be it known that I, JOHN EZRA TAYLOR, a citizen of the United States, residing at Walla Walla, in the county of Walla Walla and Washington Territory, have invented certain new and useful Improvements in Steam-Generators; and I do hereby 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in steam generating appliances, and is designed to produce steam in less time and with much smaller amount of fuel than with ordinary means, the said invention consisting of a device constructed and arranged substantially as illustrated in the drawings and described and claimed hereinafter.

In the accompanying sheet of drawings, Figure 1 is a side elevation of a device, illustrating my invention, partly in section; and Fig. 2 is an end elevation of the same.

Similar reference-letters indicate corresponding parts in each of the views.

A in the drawings indicates a steam dome or receptacle, in which the steam collects as it is generated.

B is a water tank, placed, preferably, above and on top of the dome A, from which a conduit-pipe, *b*, leads downward into the furnace-box *c*, and through a block of iron, *d*, therein up into the steam-dome through the tube *d'*, after the manner shown in Fig. 1. Check-valves *e e'* are provided in the conduit *b*, to regulate the flow of water, and a force-pump, *f*, connected with and operated by an eccentric on a steam-engine, to which the steam-done supplies the steam for running said engine, is employed to pump the water from the tank through the conduit into the block *d*, in which the water is converted into steam. The check-valves *e* and *e'* allow the water to flow from the tank toward the hollow block, but prevents the backflow of the same. These may be dispensed with when the water is intended to flow by its own weight into the block; but are considered preferable when a pump is used to force the water into the block. The furnace contains enough fire to heat the iron block and to maintain a sufficient temperature to convert the water as it flows therein into steam which rises up into the dome A. By this arrangement the water is rapidly changed to steam; but a small quantity of water at a time coming in contact with the fire or heated block, instead of a large body of cold water, which requires a high temperature and a large firing-surface to vaporize the water. The fire-box *c* is placed at some distance below the steam-dome, to which it is secured by braces *c'*, to prevent the fire from burning and blistering the dome.

E is a cold-water pipe, through which the tank B is supplied, and F is a pipe leading from the exhaust of the engine, through which the exhaust-steam passes, and by means of which the water in the tank is heated before it flows into the conduit *b* and heater *d*.

A draft and smoke pipe, G, leads from the fire-box into the chimney.

In the pipe *d'*, which leads from the heating-block *d* to the dome, is arranged a check-valve, d^2, which is designed to prevent the back pressure from the steam-dome into the block.

To blow off the condensed steam from the dome, a faucet, *h*, is provided, as shown in Fig. 1.

The dome may be inclosed in a jacket or covering of wood or other material, to prevent the radiation of the heat and condensation of the steam, which may be conducted to the engine, &c., through the pipe *i*, or in any other suitable method.

By means of the method and devices hereinbefore described steam can be rapidly generated with but little expenditure of time and fuel, and as the steam when generated is not in contact with a large body of water it is received and held in the dome in a very dry condition.

The furnace *c* is provided with a fire-grate constructed in any of the usual ways.

I do not wish to be understood as claiming, broadly, the method of heating the feed-water by the exhaust-steam from the engine, as it does not originate with me, but use it solely in combination with the other portions of my invention.

Devices for generating steam rapidly or

flashing have been made, but they are complicated in construction and much less effective than my improved flasher, which is arranged in the fire-box in direct contact with the flame and not with the heat alone. The water-tank, being arranged above the steam-receiver and directly over the fire-box, receives the full heat therefrom, and the heating of the water is still further assisted by the exhaust-steam pipe from the engine. It will be thus apparent that as the heated water flows either by gravity from the tank or is forced by a pump into the block it is instantly converted into steam and rises up into the receiver, whence it passes to the engine. The primary arrangement, however, which I deem of the greatest practical value is placing the hollow block, into which the water flows in small quantities, directly into the fire in the midst of the flames.

Having thus described my invention, I desire to claim the following:

1. In a steam-generator, in combination, a steam-receptacle and superheater, a water-tank arranged above said receptacle, a fire-box arranged beneath said steam-receptacle, a hollow block into which the water from the tank flows in small quantities, and placed in the fire-box in direct contact with the flames, and pipes connecting said blocks with the water-tank and the steam-receptacle, for the purposes set forth.

2. In a steam-generator, in combination, a steam receiver and superheater, a water-tank arranged above said receptacle, a fire-box placed beneath said steam-receptacle, a hollow block into which the water from the tank flows in small quantities, placed in the fire in direct contact with the flames, the cavity in said block being connected with the steam-receptacle by a pipe provided with a check-valve therein, a conduit connecting the water-tank with the cavity in the block and provided with check-valves *e e'* therein, and a force-pump connected with said conduit between the check-valves, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of August, 1885.

JOHN EZRA TAYLOR.

Witnesses:
JOHN A. TAYLOR,
WM. P. DOLAN.