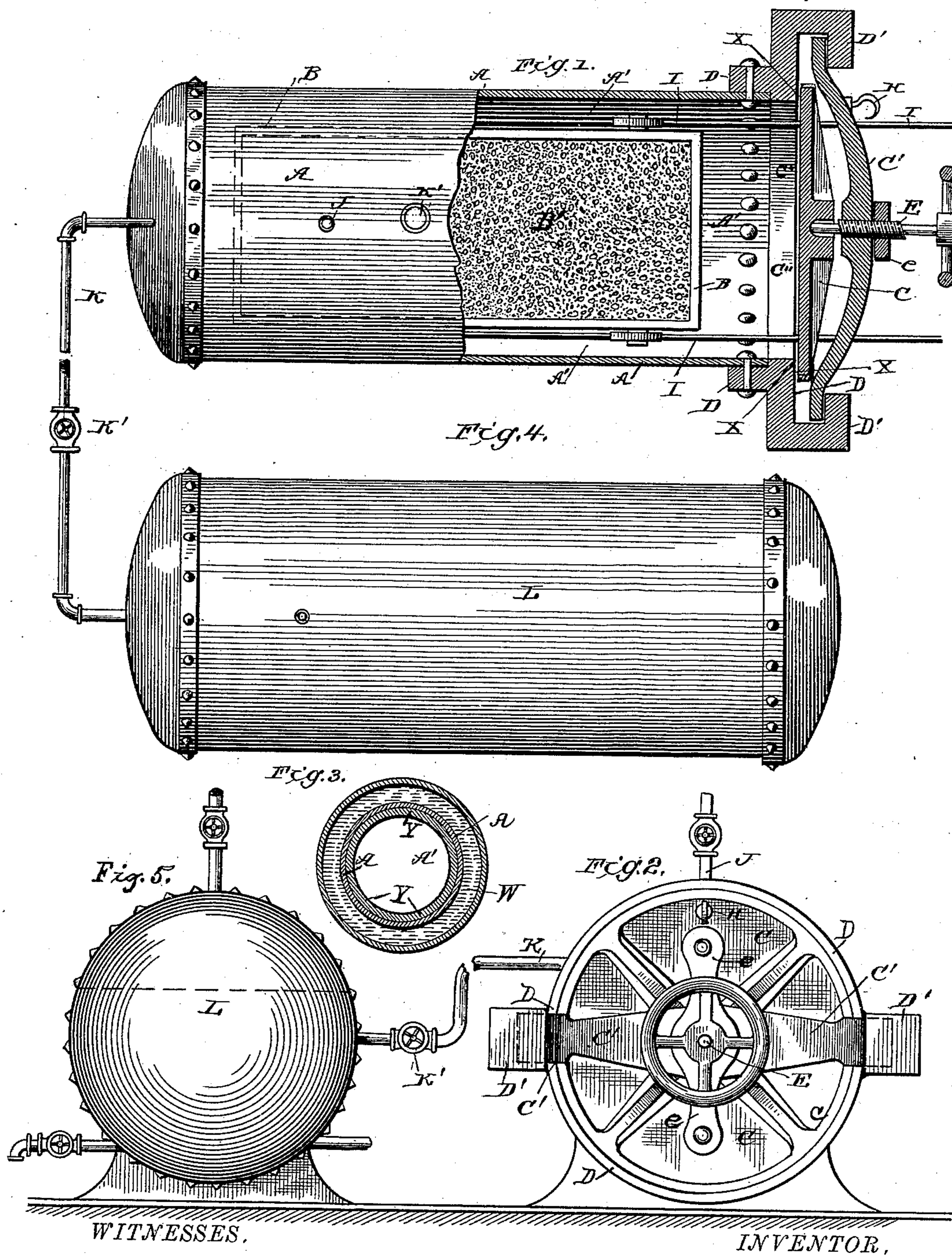


(No Model.)

O. B. PECK.
SLAG STEAM GENERATOR.

No. 395,665.

Patented Jan. 1, 1889.



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UNITED STATES PATENT OFFICE.

ORRIN B. PECK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE AMERICAN SLAG FURNACE COMPANY.

SLAG STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 395,665, dated January 1, 1889.

Application filed February 20, 1888. Serial No. 264,606. (No model.)

To all whom it may concern:

Be it known that I, ORRIN B. PECK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Slag 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.

The object of my invention is to make a steam-generator adapted to be employed in the generation of steam by bringing water in contact with hot slags in a closed chamber provided with suitable steam and water pipes and with one or more passages adapted to be opened and closed, through which to introduce hot slags to the generating-chamber and to remove them when they become cooled.

In the drawings, Figure 1 is a top plan view of my slag steam-generator, with a portion of the upper side of the shell broken away, showing the steam-generating chamber, the car containing slag located therein, the cover, and means for supporting it, which are shown in section. Fig. 2 is a front elevation of Fig. 1, showing the parts whole. Fig. 3 is a vertical cross-section of a modified form of the generating-chamber shown in Fig. 1, showing a surrounding water-space and internal lining. Fig. 4 is a top plan view of the steam wash and storage chamber; Fig. 5, a front elevation of Fig. 4.

In the drawings, A represents the body or shell of my slag steam-generator; A', the slag and steam chamber, in which the steam is generated. B is a slag car or receptacle in this chamber; B', slag in the said receptacle; C'', an opening or passage to the steam-generating chamber, through which slags are introduced and removed.

C is a door or cover to close the opening C''; C', a bar or brace to support the cover.

D is a ring or collar around the end of the shell A; D' D', brackets to support and secure the bar or brace while in place; E, a screw to force the cover closely to its place; e, a strap to assist in holding the screw in place; H, a hook through which the cover may be removed; x, a smooth surface of the ring or col-

lar D, against which the door or cover rests; I, a track extending into the generating-chamber; J, a water-supply pipe; K, steam-exhaust pipe; K', steam-valve; K'', blow-off valve; L, a steam wash and storage boiler; W, Fig. 3, a water-space surrounding the chamber A'; Y, a lining in the chamber A'.

In making my slag steam-generator I provide a chamber or receptacle, A', which may be made of any suitable material and of any desired shape, only so it is capable of receiving a quantity of hot slags and sustaining the desired internal pressure, and I provide it with suitable water-supply and steam-exhaust passages or pipes J and K. It may also be made or provided with a surrounding jacket affording a water space or chamber, W, as shown in Fig. 3 of the drawings, or such water-space may only partly cover it. This water serves to collect and utilize the heat radiated from the chamber and prevents the shell A from becoming overheated; and I may also provide a lining, Y, (shown in Fig. 3,) of cast-iron or other suitable material, inside the chamber A', to protect the shell A and prevent it from being destroyed by the intense heat of the slag and steam contained in the chamber, although this water-space and lining are not necessary to the operation of the generator, and may be dispensed with. I preferably make a cylindrical shell, A, of boiler-iron, thus forming the chamber A', and leave one end open, C'', around which I secure the ring or collar D, carrying the brackets D', which affords a solid sufficiently-broad surface, X, for the cover or door to rest or bear against.

The cover or door C is to be placed over the hole or opening G'' and comes in contact with the surface X of the ring or collar D, as shown. I also provide a bar or brace, C', preferably secured to the cover in a pivoted manner, as shown, and adapted to be swung or turned around when the cover is in place, so that its ends will come under the overhanging or extended brackets D', and be held in place by them. This bar, through the assistance of the strap e, carries a screw, E, as shown, which bears against the center of the cover C, and when the cover and bar are in place serves to press and hold it up in rigid

and close contact with the collar D, thus closing the opening C'' and rendering the chamber A' steam-tight.

Secured to the cover is a hook, II, through which it may be lifted or moved from place by a suitable crane or other convenient means. I preferably provide tracks I I, extending through the opening C'' into the chamber A', although I leave a sufficient break or space in the track at its entrance to the chamber to allow of the proper manipulation of the cover or door C, and I provide a car, B, adapted to contain slags and to be run into this chamber; or, if desirable, this car may be dispensed with, the tracks removed, and the slags allowed to flow into or otherwise be placed in the chamber, and be removed or discharged therefrom by shoveling, or dumping, or other ways.

While I have particularly described and shown one design of a steam-generator, I do not wish to be confined to the use of this particular mechanical design, shape, or means of operating or handling the parts, which may readily be varied—as, for example, the opening to the generating-chamber may be smaller, and two or more openings substituted for the one, and the means of covering or closing it may be arranged in any convenient way, as by a hinged cover, or a cover run on a suitable track, with various means of securing it in place over the opening or passage.

As an example of another design of my generator, I refer to my application for United States Letters Patent for a "process of generating steam by bringing water and slag in contact in a closed chamber," filed September 26, 1887, Serial No. 250,678.

Of course it will be understood that the proper water and steam pipes and valves are supplied to the steam-generating and steam receiving and washing chambers where needed.

To wash or cleanse the steam generated in the chamber A' and to equalize its temperature, I employ a chamber or drum, L, adapted to hold steam and containing a quantity of water, and connect it to the chamber A' by the pipe K or other suitable steam-passages. This drum or chamber also serves as a steam-storage chamber. The steam generated in the chamber A' passes through the pipe K and into and through the water in the chamber or drum L. It will be understood that the pipe K should connect with the chamber L below its water-line, thereby bringing all the steam in contact with and through the water.

In operating my steam-generator I remove the cover or door C, place a desired quantity of hot or molten slag or other similar material in the chamber A' by means of the car B, or other receptacle, when one is used, and replace the door, securing it with the screw E, and then introduce water into the chamber in contact with the hot slag, by means of the pipe J, thereby converting it into steam and cooling the slag.

The steam passes through the pipe K to the chamber or vessel L and is cleansed, from which place it may be drawn for use. If desirable, there may be employed separate storage and wash and cleansing chambers for the steam; or when the chamber L is not used the steam may be drawn for use directly from the chamber A'. When the slag has become so cooled as to no longer convert the water into steam, the door or cover C may be opened, the slag removed, and hot slag put in its place. When the chamber L or other steam-storage is used, the steam may be prevented from escaping through the chamber A' while open by the proper use of the valve K' in the pipe K. The chamber L may also be used as a steam-storage receptacle to afford a continuous supply for use, if desired. When desirable, two or more of these generating-chambers may be operated together and connected to the wash or storage chamber L, the chambers A' being successively supplied and emptied of slag, whereby a more continuous supply of steam will be afforded to the storage-chamber.

What I claim as new, and desire to secure by Letters Patent, is—

1. A slag steam-generator consisting of a chamber provided with suitable water-supply and steam-exhaust pipes, in combination with a vessel adapted to receive heated or molten materials, said vessel being constructed to be placed in said chamber, and means for closing the chambers, substantially as described.

2. A slag steam-generator consisting of a jacketed chamber provided with suitable water-supply and steam-exhaust pipes, in combination with a vessel adapted to receive heated or molten materials, said vessel being constructed to be placed in said chamber, and means for closing the chambers, substantially as described.

3. A slag steam-generator consisting of a chamber provided with rails on the interior of the chamber and with suitable water-supply and steam-exhaust pipes, and means for closing the chamber, in combination with a wheeled vessel adapted to receive heated or molten materials and to be used in connection with the aforesaid chamber in the generation of steam, substantially as described.

4. The combination of a slag steam-generator having one or more steam-generating chambers and adapted to receive hot or molten materials and provided with suitable water-supply and steam-exhaust pipes or passages, and means for closing the said chambers, with a steam-receiving drum or chamber having a steam pipe or passage communicating with the steam-generating chamber or chambers, whereby the steam may pass from the generating-chambers to the storage or receiving chamber, substantially as described.

5. The combination of a slag steam-generator having one or more chambers wherein steam is generated by bringing water into direct contact with hot or molten material, with

a chamber containing water and a steam-passage from the steam-generating chamber, whereby the steam may pass from the generating-chambers into the said chamber containing water and in contact with the water, whereby the steam may be washed or cleansed of its impurities and its temperature equalized, substantially as described.

6. In a slag steam-generator having a chamber wherein steam is generated by bringing water in direct contact with hot or molten slag and having water-supply and steam-ex-

haust pipes or passages, a lining in said chamber to protect the shell or walling that forms the chamber and prevent it from being destroyed by the intense heat of the slag or the steam within, substantially as described. 15

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

ORRIN B. PECK.

Witnesses:

H. W. FOSS,
J. W. HOWELL.