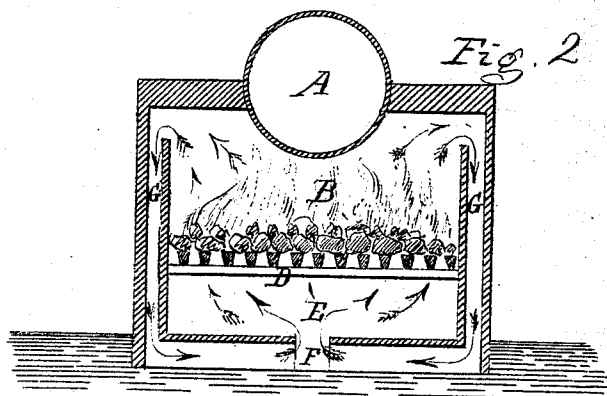
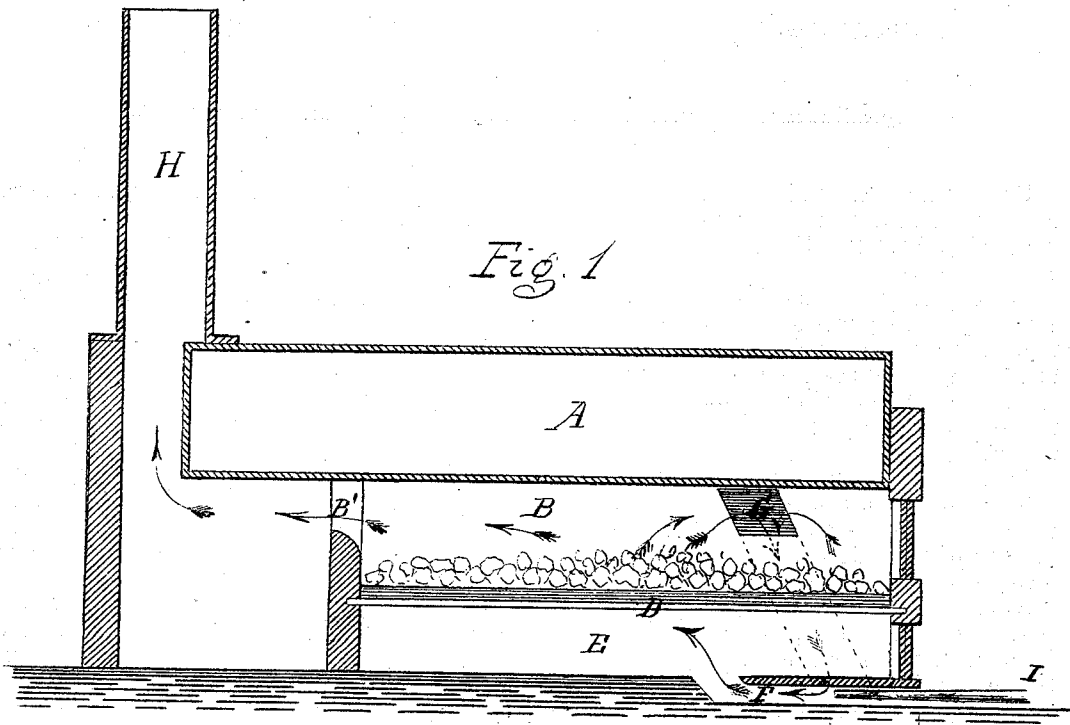


Improvement in Furnaces for Steam Generators.

No. 122,365.

Patented Jan. 2, 1872.



Attest
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UNITED STATES PATENT OFFICE.

WILLIAM F. COX, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FURNACES FOR STEAM-GENERATORS.

Specification forming part of Letters Patent No. 122,365, dated January 2, 1872.

Specification describing certain Improvements in Furnaces for Steam-Generators, invented by WILLIAM F. COX, of Philadelphia, Pennsylvania.

The object of this improvement is to effect economy in the generation of steam by restoring the heat contained in the exhaust steam to the fire-box of the steam-generator in a better manner than has heretofore been done, and instead of wasting it into the open air, as is commonly done.

This object is effected by discharging the exhaust steam into the space below the grate-bars, whence it rises with the draught through the bed of incandescent fuel, restoring to the furnace whatever heat it may retain. This, however, could not be done by simply discharging the exhaust steam into the fire-box, for in such case it would extinguish the fires. It is necessary, in order to avoid this consequence, that the steam should be dried or superheated, and to effect this I propose to draw down a portion of the flame from the fire-box or combustion-chamber into the conduit through which the exhaust steam is to be introduced, and by mingling these incandescent gases with the steam to dry the latter to such an extent that it will no longer operate to quench the fires.

To enable others skilled in the art to practice my improvement, I will proceed to describe one mode in which it may be applied, leaving to the skill of the constructor such modifications of form and arrangement as may be convenient for the adaptation of the principle of my invention to furnaces of different form and purpose.

In the annexed drawing, A is an ordinary steam-generator, which may be taken as indicating the thing to which the heat generated in the fire-box or combustion-chamber is to be applied, and which may be any known form of generator. B is the fire-box or combustion-chamber, which may also be of any form, as convenience and the special purposes for which it is intended may require. The fuel subjected to combustion, represented at C, rests upon the grate-bars D, which may also be of any known kind. E is the space below the grate-bars, through which the draught enters, which, ris-

ing through the bed of fuel, supports the combustion thereof.

As all the above parts are those constituting the ordinary furnace of a steam-engine greater particularity of description will not be required.

The exhaust steam is introduced through the conduit F into the space E. It is brought through the pipe I and discharged through its terminal orifice into the conduit F in such manner as to occasion a strong draught through the latter, for the purpose of drawing down a portion of the flame from the combustion-chamber through one or more flues, G, built in the side walls or otherwise, so as to form a conduit or conduits through which such flame may be drawn from the space in the combustion-chamber above the grate-bars, and discharged into the conduit F in such manner that the entering steam may be mingled with the flame and heated gases drawn from the combustion-chamber and thereby dried or superheated before being delivered into the space E, whence, mingling with the draught of air, it will rise through the incandescent fuel and be discharged through the throat B' into the uptake H. Should the heat of the flame and fuel be sufficient to decompose the steam into its original gaseous elements these mingled gases will be burned in the fire-box, adding greatly to the intensity of the heat developed.

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

The combination of a conduit into which the exhaust steam is discharged, and a flue or conduit leading from the fire-box or combustion-chamber, when arranged in such relation to one another and to other parts that flame drawn down through the latter by an induced draught mingling with such steam would superheat or dry the same before it is allowed to pass into such fire-box or combustion-chamber, in manner substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM F. COX.

Witnesses:

R. MASON.

ALONZO HUGHES.

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