

(No Model.)

E. FALES.
DEVICE FOR GENERATING STEAM.

No. 442,966.

Patented Dec. 16, 1890.

Fig. 1.

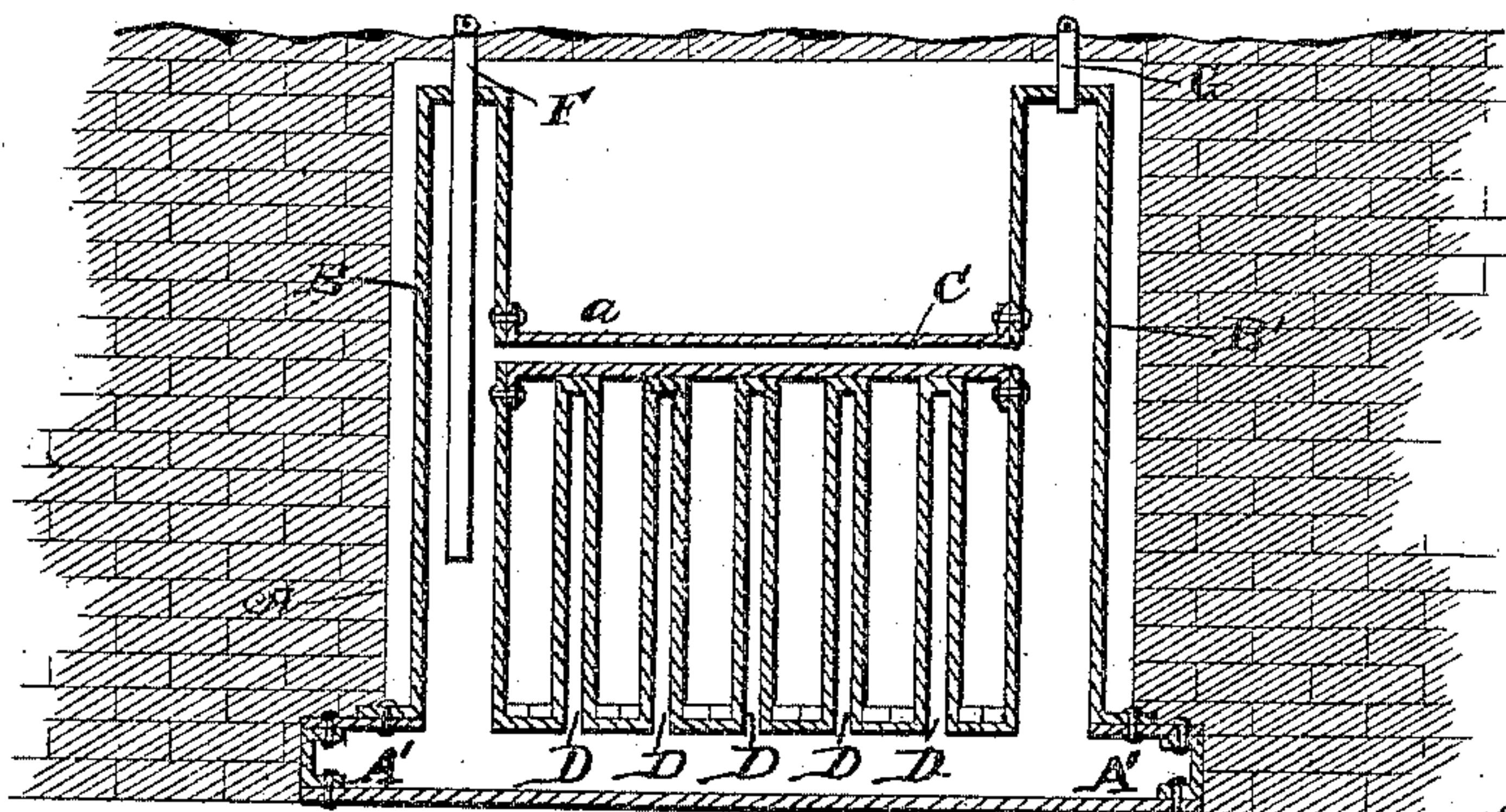


Fig. 2.

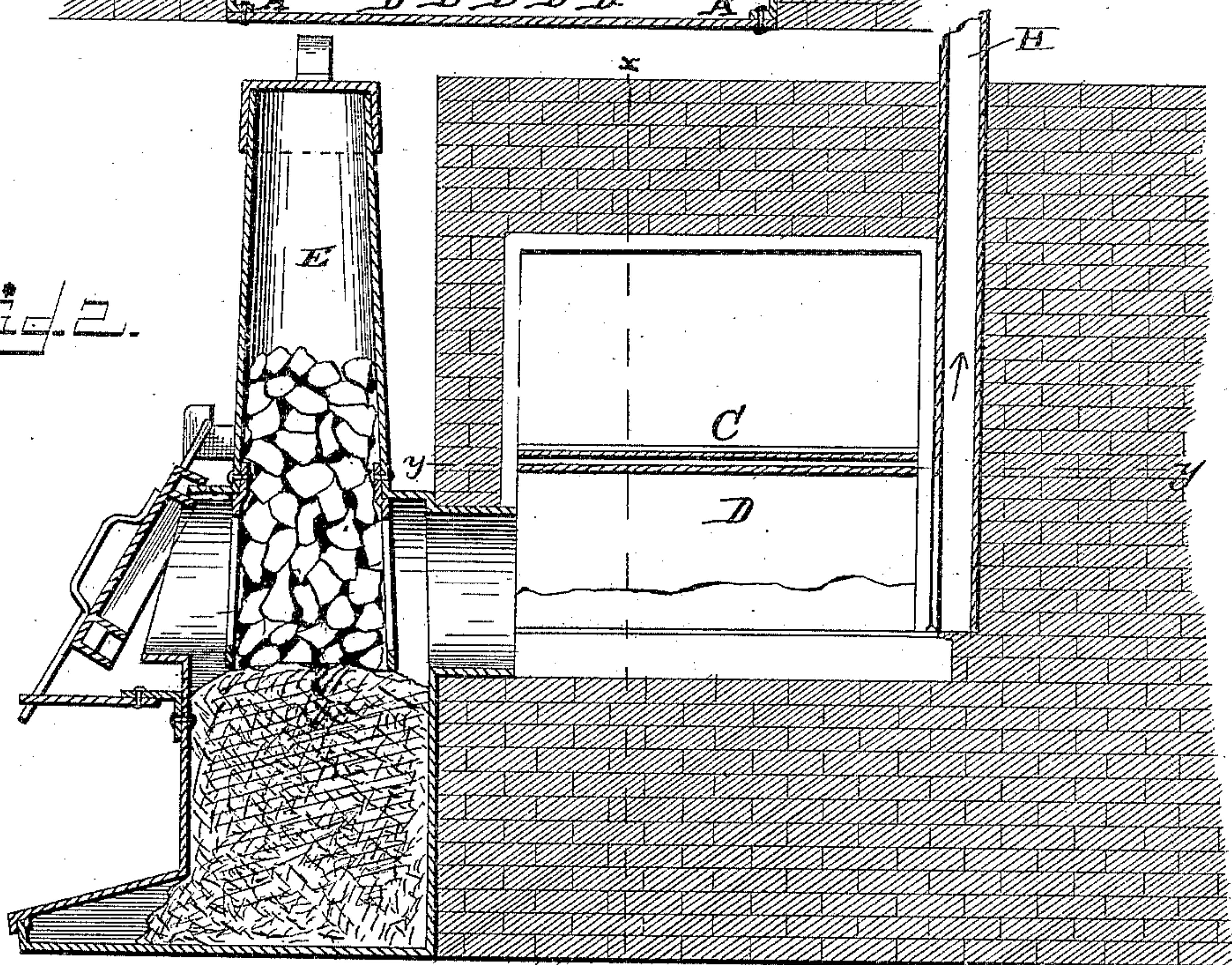
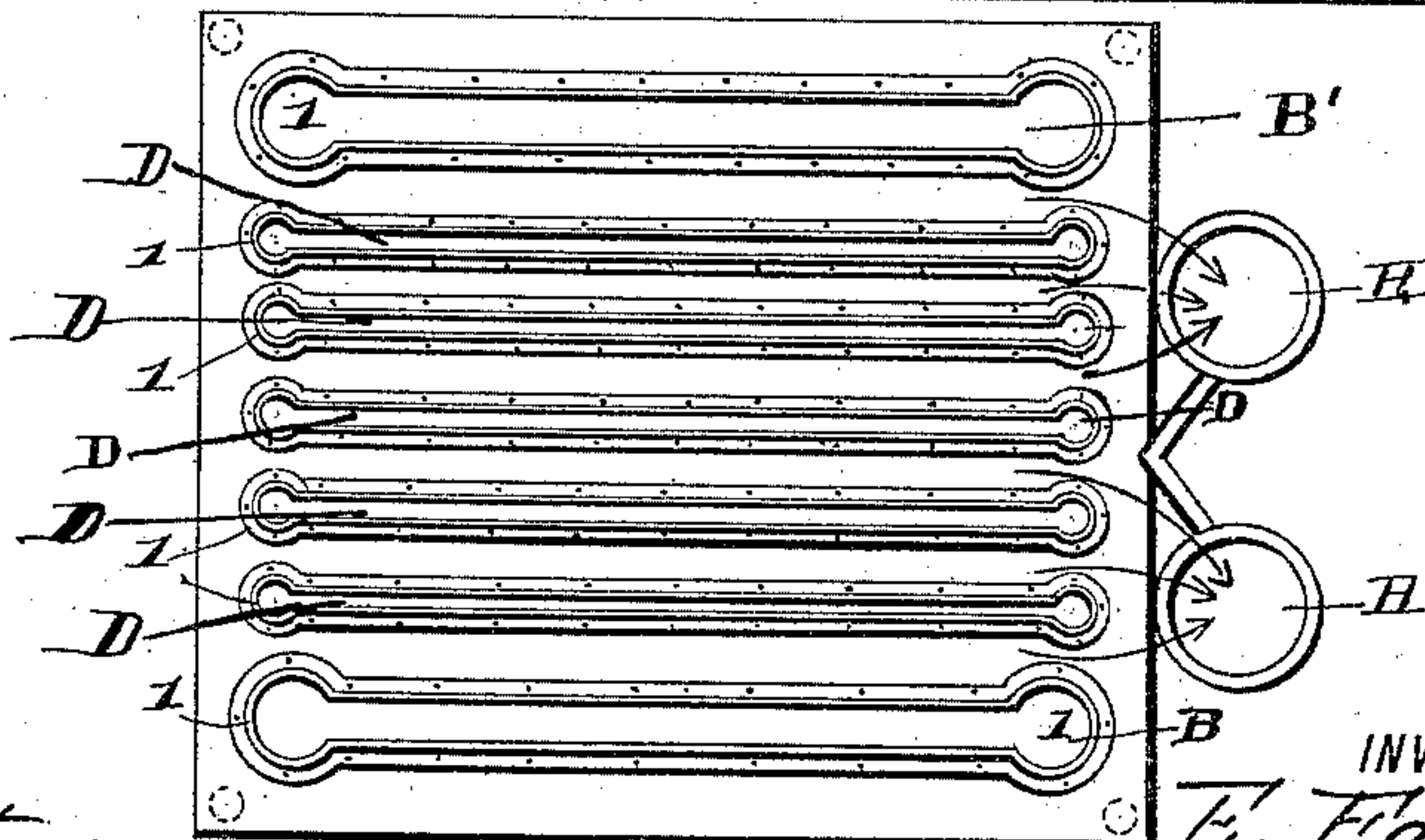


Fig. 3.



WITNESSES:

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DEVICE FOR GENERATING STEAM.

SPECIFICATION forming part of Letters Patent No. 442,966, dated December 16, 1890.

Application filed June 24, 1890. Serial No. 356,571. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FALES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Devices for Generating Steam; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to devices for generating steam.

The object of my invention is to provide a device which will generate steam or heat a circulating body of water with much less fuel and in a shorter period of time than has heretofore been accomplished.

My invention consists in forming a heater having a series of thin water-compartments, around which the products of combustion pass, which compartments communicate with a lower and upper chamber and side chambers of larger capacity, into which the water is fed and from which the steam or circulating body of water is taken to be used for running engines or for heating purposes.

Referring to the drawings, Figure 1 is a vertical sectional view of my improved device, taken on the line *xx* of Fig. 2. Fig. 2 is a longitudinal sectional view of a furnace and my improved generator or heater. Fig. 3 is a horizontal sectional view of my generator or heater, taken on the line *yy* of Fig. 2.

A indicates the generator or heater, which is set in a suitable housing of brick-work or masonry or incased with iron or wood in any suitable manner, so as to attain the results sought. The generator is composed of a hollow base *A'* of any suitable size or dimensions, which communicates with the hollow columns or chambers *B B'*, the columns or vertical water-chambers *B* and *B'* being connected together by the horizontal chamber *C*. Between the hollow columns or chambers *B* and *B'* is arranged a series of thin vertical water-chambers *D D*, the lower ends of which communicate with the base *A'*, as shown in Fig. 1, while the upper ends of said chambers extend up and rest against the under side of the horizontal water-chamber *C*.

E is a furnace of any suitable construction; but I prefer to use the furnace described, shown, and claimed in my patent, No. 415,626, granted November 19, 1889. The combustion-chamber of the furnace opens into the space surrounded by the chambers *A'*, *B*, *B'*, and *C* and allows the products of combustion to pass on each side of the thin water-chambers *D* and in this manner rapidly heat the water contained in the several chambers. After passing by on each side of the chambers *D* and imparting the heat thereto the waste products of combustion find their way through two flues *H* to a suitable stack or chimney. The ends of the chambers *B*, *B'*, and *D* are made larger or of greater diameter than the main body of the chambers, as shown at 1, Fig. 3, so as to retain a volume of water sufficient to keep the main body supplied with water at all times, and in this way accidents from explosion are obviated.

F is a pipe extending into and reaching nearly to the bottom of the chamber *B* and through which water is supplied to the generator. *G* is also a pipe leading from the chamber *B'* and through which the steam or hot water is conducted to the place of usage.

It will be noticed that the chambers *D* are very narrow in cross-section, and that a large surface is exposed to the heat of the furnace, so that the water in these narrow chambers is rapidly heated and circulates around through the chambers *A'*, *B B'*, and *C* and the steam and water drawn off to the place of usage.

What I claim is—

1. In a device for generating steam and for the circulation of hot water, a combustion-chamber inclosed and water-chambers on four sides thereof, in which is arranged a series of narrow chambers in the path and in the direction of the flame or products of combustion as they emerge from the furnace, whereby the water is rapidly heated and circulated to the other water-chambers and to the place of usage.

2. In a device for generating steam or for the heating and circulation of water, a series of thin water-holding chambers located in the path of the flame from the furnace, said chambers communicating with other water-chambers which surround on four sides the products of combustion from the furnace,

whereby the production of steam or a circulation of hot water is maintained.

3. In a device for generating steam and for the heating and circulation of water, a series
5 of thin water-holding chambers located in the path of the flame from the furnace, said chambers being connected with and opening into a chamber extended across the furnace in the lower part of the generator, whereby
10 the water is fed up into the narrow chambers from the chambers below, as set forth.

4. In a steam-generating device having a

series of chambers arranged as shown, vertical water-chambers located in the path of the products of combustion from the furnace, 15 provided with enlarged end portions and intermediate thin or narrow portions, substantially as and for the purpose set forth.

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

EDWARD FALES.

Witnesses:

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