

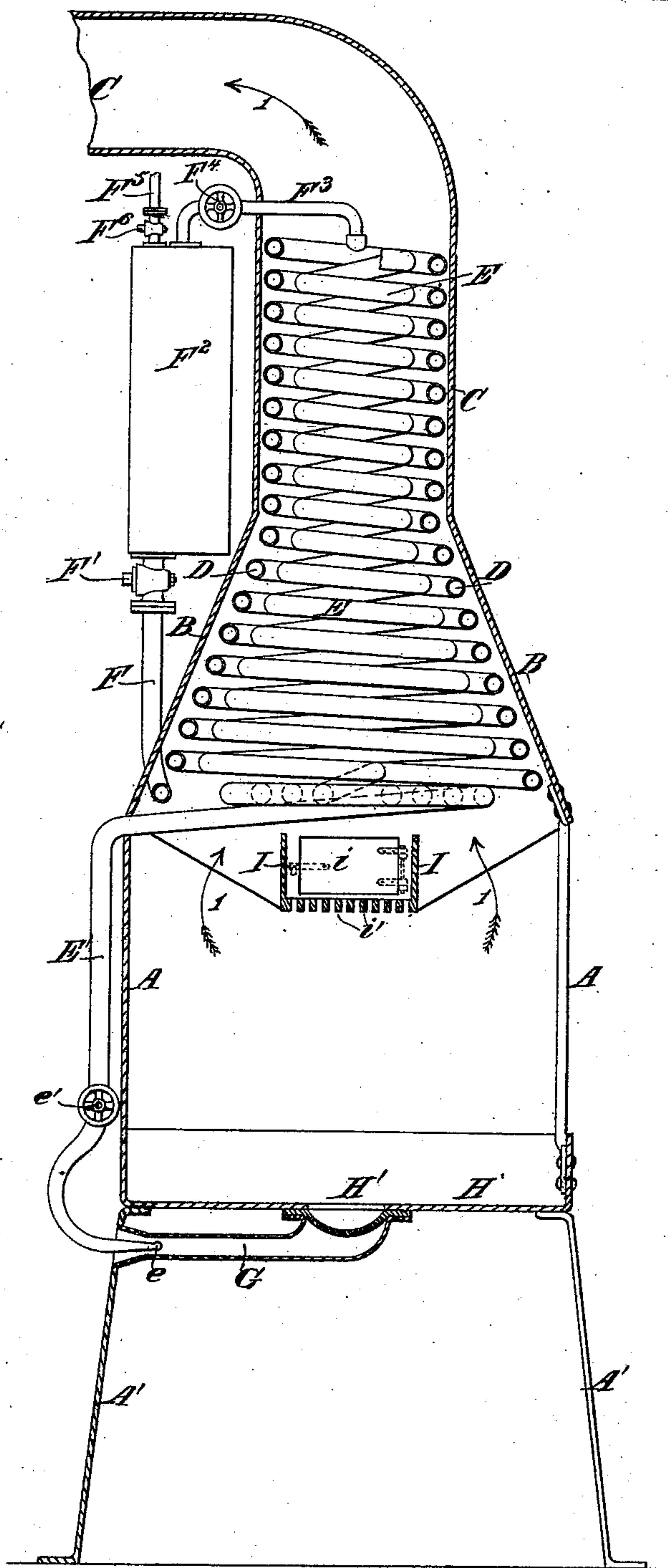
(No Model.)

B. T. BABBITT.

## BLAST APPARATUS FOR FORGES.

No. 273,433.

Patented Mar. 6, 1883.



**Witnesses:**

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*Inventor:*

Inventor:  
B. J. Babitt  
by his Attorneys  
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# UNITED STATES PATENT OFFICE.

BENJAMIN T. BABBITT, OF NEW YORK, N. Y.

## BLAST APPARATUS FOR FORGES.

SPECIFICATION forming part of Letters Patent No. 273,433, dated March 6, 1883.

Application filed October 28, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN T. BABBITT, a citizen of the United States, residing in the city, county, and State of New York, have invented an Improved Blast Apparatus for Smiths' and other Forges, of which the following is a specification.

My invention consists in a novel arrangement of steam-coils within the open hood and chimney of a smith's forge, for the purpose of generating and superheating steam to be employed as a steam-blast, and for inducing a blast of air to such forge, such coils being supplied with water from an outside reservoir, and being heated by the escaping heat from the fire on the hearth of the forge.

In order to provide for the generation of steam at early morning or after the apparatus has become cold from non-use, the invention also consists in a small auxiliary furnace beneath the coils, which can be lighted, when desired, and be kept alight for such time as may be necessary to generate sufficient steam to create a blast sufficient to blow up the fire on the main hearth.

The accompanying drawing forms part of this specification, and illustrates what I consider the best means for carrying out my invention.

In the drawing I have represented a central section of a forge with my improvements applied thereto.

A represents the main framing of the forge, which is supported on a pedestal or foundation, A'. B is the hood, and C the chimney.

Within the hood B and chimney C is represented a double series of coils of steam-pipes, D E, one within the other. The outer series, D, serves for steam-generation, while the series E serves to superheat the steam generated in the series D. Water is supplied to the lowest coil of the series D by means of a pipe, F, controlled by a stop-cock, F', connecting with a closed cistern or reservoir, F<sup>2</sup>, which, at its upper end, is provided with a steam-pipe, F<sup>3</sup>, controlled by a valve, F<sup>4</sup>, and communicating with the upper pipe of the series of coils D, for the purpose of balancing the pressure in the coils D and the cistern or reservoir F<sup>2</sup>.

Water is supplied to the closed cistern or

reservoir F<sup>2</sup> by means of a pipe or tube, F<sup>5</sup>, controlled by a cock or valve, F<sup>6</sup>, which is only opened when it is desired to fill the cistern or reservoir F<sup>2</sup>.

The steam generated in the outer series of coils, D, is conducted upward to the highest tube of the series D, from which it is conducted to the uppermost tubes of the series E, after which it is conducted down through the series E and superheated, it is then conducted by the pipe E', (which forms a continuation of the lowest tube of the series E,) to and within the mouth of the tuyere G, leading to the fire-place H' on the forge-bed H. The superheated steam is discharged from the pipe E' into the tuyere G through a steam-nozzle, e, formed on or affixed to the end of the pipe E', and induces a current of air through the tuyere into the fire. The superheated steam, passing from the pipe E' through the nozzle e, becomes mixed with the atmospheric air entering through the tuyere, and the said mixture combining with the fuel produces intense combustion.

The waste heat from the fire on the bed or hearth H of the forge, escaping by the hood or chimney, serves as the means of generating and superheating the steam employed in creating the draft after the apparatus has been fully started. The amount of steam allowed to escape into the tuyere G, and consequently the amount of blast created thereby, is regulated by a stop-cock or valve, e'.

In order to generate sufficient steam in the early morning or after the apparatus has become cold or been out of use for some time, I construct a small auxiliary furnace, I, within the lower part of or just beneath the hood, and within this furnace a small fire can be lighted, when desired, and kept lighted until the fire on the bed or hearth H has become sufficiently powerful to generate the necessary amount of steam in the coils D E to create a sufficient blast to work the apparatus.

The furnace I is provided with a suitable fire-door, i, opening to the exterior of the device, and is furnished with grate-bars i', of any suitable form or construction.

The operation of the device is as follows: On starting the device a fire is lighted in the auxiliary furnace I, by means of which steam



is generated in the coils D and superheated in the coils E, until a sufficient pressure is obtained in the coils E and pipe E' to create a blast in the tuyere sufficient to blow up a fire on the main bed or hearth H. The fire in the furnace I may then be allowed to go out, and the blast will be maintained by means of the pipe E' and tuyere G so long as desired, and the fire on the bed or hearth H is supplied with fuel. The heat and products of combustion generated by the fire on the bed or hearth H pass in the direction of the arrows 1 1 between and among the coils D E, and thence away by the chimney.

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

1. The combination, with a forge, of an outer series of steam-generating coils or tubes, D,

an inner series of steam-superheating tubes, 20 E, a steam-supply pipe, E', nozzle e, tuyere G, bed or hearth H, a cistern or reservoir, F<sup>2</sup>, and a water-tube, F, and steam-tube F<sup>3</sup>, controlled by valves, as and for the purpose described.

25 2. The combination, with a forge and with steam generating and superheating coils arranged in the hood thereof to produce an automatic blast, of a supplementary furnace arranged immediately beneath the hood to generate and superheat the steam in the coils on starting the apparatus, substantially as shown and described. 30

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Witnesses:

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