(No Model.)

E. A. WHEELER.

BOILER AND BOILER FURNACE.

No. 489,726. Patented Jan. 10, 1893.

Fig. 1.

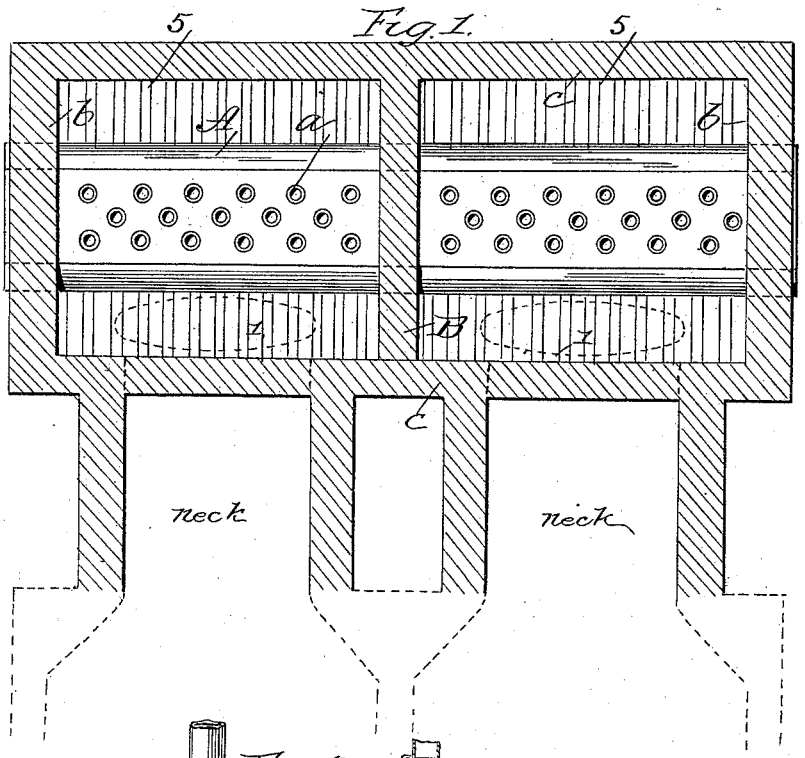

Fig. 3

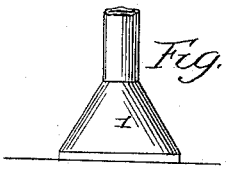

Fig. 2.

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UNITED STATES PATENT OFFICE.

EARL A. WHEELER, OF SHARON, PENNSYLVANIA.

BOILER AND BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 489,726, dated January 10, 1893.

Application filed January 23, 1892. Serial No. 419,004. (No model.)

To all whom it may concern:

Be it known that I, EARL A. WHEELER, a citizen of the United States of America, residing at Sharon, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Boilers and Boiler-Furnaces, of which the following is a specification.

In an application filed in the United States Patent Office on the 10th day of November, 1891, Serial No. 411,537 I have shown an improved form of boiler located within the stack of a heating or puddling furnace which enables me to utilize the heat of said furnace, ordinarily wasted, to generate steam, and I also show means for generating steam in the boiler when the puddling or other furnace is not in action.

The present invention relates to the same idea of utilizing the waste heat of a puddling, heating or other furnace by locating a steam generator in the stack thereof, but differs from the former application in that in the present case two single furnaces are shown and a particular arrangement of the generator in connection therewith to utilize the heat passing into the stacks.

In the accompanying drawings: Figure 1 represents a plan view of the rear parts of two ordinary puddling or heating furnaces placed back to back provided with a generator in the stack space thereof. Fig. 2 is a vertical sectional view of the rear part of a furnace. Fig. 3 is a detail of the stack pipe.

The furnaces shown are of ordinary construction and are representative of any heating puddling or other furnace or stack where there is a large amount of waste heat, sufficient to generate steam. As shown there are two of these furnaces placed back to back with the necks of the furnaces leading to the stacks parallel. These necks discharge the heat and products of combustion into the stack space and in the present case I have located in this space the upper and lower boilers of the improved construction set forth in my United States Patent No. 465,303 of December 15, 1891, which are connected by the series of water tubes *a*. The boilers while of the same construction as in the patent referred to are of a length sufficient to extend between the walls *b*—*b* of the stack space which inclose the stacks of both furnaces the heads of the boilers projecting outside said walls.

The boilers are indicated at A. They are connected by a series of water tubes *a* which extend between the upper and lower boilers. These tubes are not continuous throughout the stack but are interrupted by a division wall B arranged centrally which separates the space into two chambers through which the boilers extend, the wall being built around the said boilers and serving as an intermediate support therefor. The stack space formed by the walls *b*, *b*, and *c*, *c*, and divided by the wall B is carried up above the line of the upper boiler at which point, the stacks are carried up separately the stack pipes being on one side of the upper boiler as at 1 Fig. 2 the other side of the boiler being closed by the brickwork 2. The pipes 1 are shown in dotted lines Fig. 1. The space around and between the stacks is closed by the plate 3. In the working of a heating or puddling furnace the heat is regulated and controlled by means of a damper in the stack, consequently each stack must be separate and independent of the other, and hence the necessity of the partition wall separating the stacks. By this arrangement it will be seen that the heat of the two furnaces is fully utilized in a very simple manner. In case however, but one of the furnaces is in action I provide for the heating of the other by a grate beneath it so that a fire can be built under that end and thus all unequal expansion avoided. As one furnace may be fired at one time and the other at another time it is necessary to provide a grate 5 for each end of the boiler and thus when neither furnace is in action fires may be started in the grates on each side if steam is needed at such a time. Thus I am enabled very simply to utilize the heat from

the two furnaces, or from one and when neither furnace is in action to still utilize the boiler as readily as if it stood alone.

I claim as my invention:

In combination with a pair of furnaces having independent heat exit openings, an independent chamber in connection with each exit opening, a horizontal boiler extending through both chambers, independent stack pipes for the chambers and grates beneath the boiler, substantially as described.

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

EARL A. WHEELER.

Witnesses:
G. W. SHILLING,
A. W. WILLIAMS.