(No Model.)

J. J. DE KINDER.

FURNACE.

No. 523,040. Patented July 17, 1894.

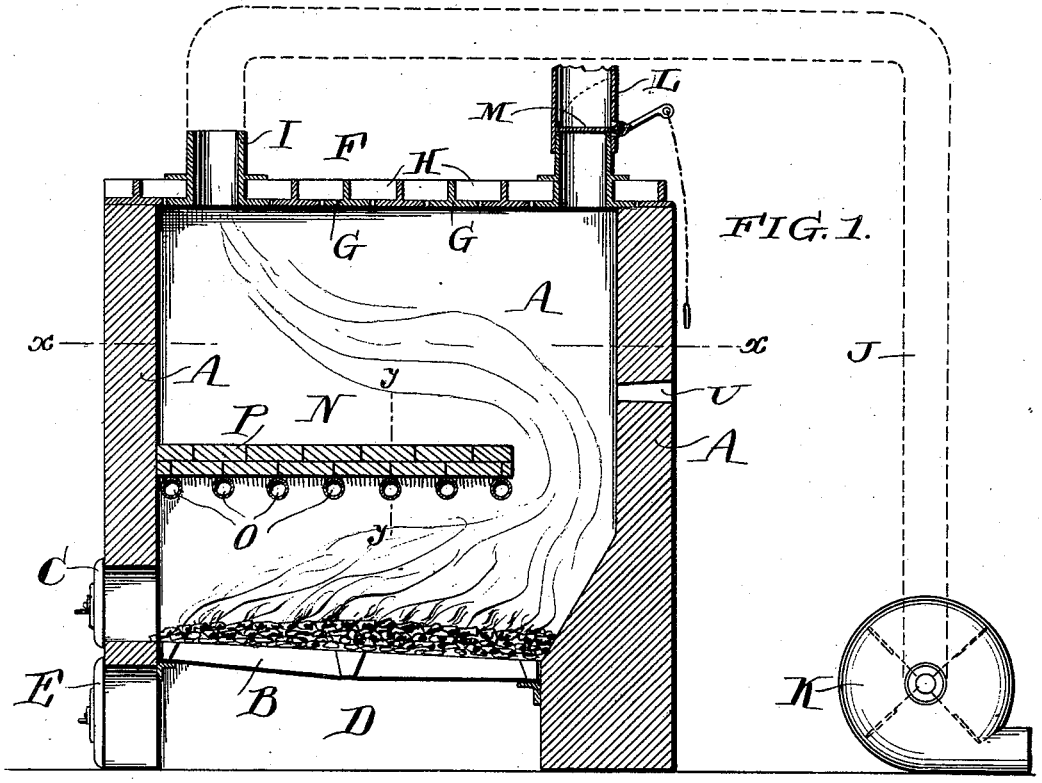

FIG. 1.

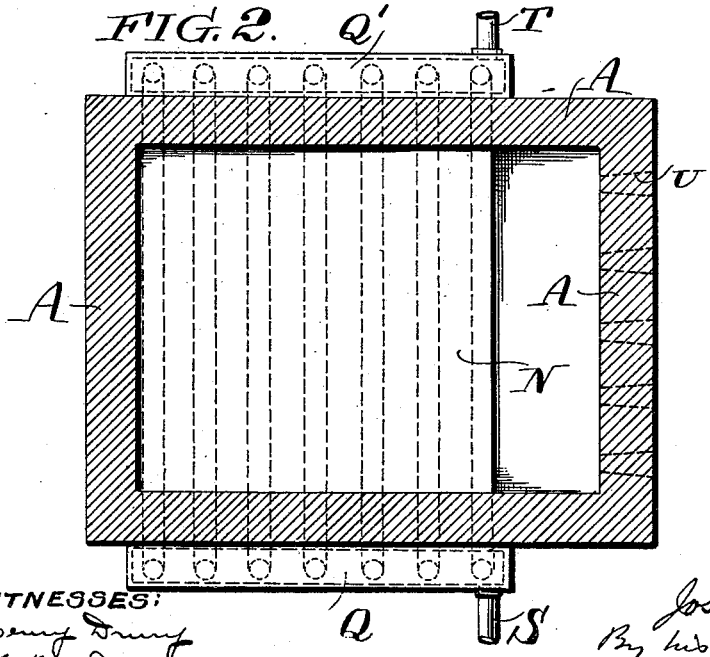

FIG. 2.

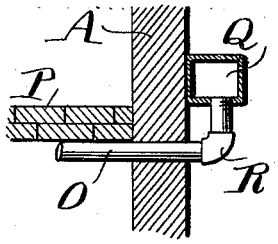

FIG. 3.

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UNITED STATES PATENT OFFICE.

JOSEPH J. DE KINDER, OF PHILADELPHIA, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 523,040, dated July 17, 1894.

Application filed September 27, 1892. Serial No. 447,070. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. DE KINDER, of Philadelphia, Pennsylvania, have invented an Improvement in Furnaces, of which the following is a specification.

My invention relates to furnaces and consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings which form a part thereof.

More particularly my invention relates to certain improvements in the construction of the arch or crown above the grate, whereby a more durable, firm, and economical arch or crown may be constructed for the purpose of increasing the combustion and the combination thereof with a water heater.

My invention is designed especially for furnaces in which the heated products are to be used for drying, heating, and similar purposes.

My invention relates to certain novelties of construction and combinations of parts hereinafter more fully described and claimed.

In the drawings: Figure 1 is a sectional side elevation of a furnace having my improvements applied. Fig. 2 is a horizontal sectional view of the same on the line *x*—*x* of Fig. 1; and Fig. 3 is a vertical sectional view on the line *y*—*y* of Fig. 1.

A are the walls of the furnace, which may be constructed in the usual manner and suitably braced.

B is the grate.

C is the grate door.

D is the ash pit, and E is the ash pit door.

F is the roof of the furnace, which I prefer to construct of pieces of angle iron G arranged transversely on the top of the furnace and covered by fire brick H.

I is an outlet flue located in the roof F and communicating through a pipe J with the fan or suction creating device K, by which the heated products of the furnace may be drawn off and fed to the heaters, driers, or other devices.

L is an outlet to the air controlled by a damper M. This outlet may be opened when the fire in the furnace is started to allow the smoke to escape, and may be closed when the thorough combustion is obtained so that the heated products may be drawn off through the outlet I.

N is a crown wall or arch arranged above the grate B to produce a more thorough combustion of the fuel. This arch consists of a series of transverse pipes O passing through the side walls of the furnace, and a covering of fire brick P resting upon the upper surface of the pipes. The pipes O firmly support the fire brick and form a strong crown or arch that is capable of withstanding the heat of the furnace. By this means a flat crown may be formed equidistant throughout its surface from the body of the fuel. I prefer this flat construction of the crown or arch N but do not mean to limit my invention to it. I also prefer to lay the bricks longitudinally upon the pipes O, the latter being located sufficiently near together to support the ends of each brick.

To prevent the destruction of the supporting pipes O, water may be circulated through them, and the water thus heated may be fed to the boiler, or may be used for any other purpose.

For conveniently circulating the water, I prefer to employ mains Q, Q′, upon each side of the furnace, connected with the pipes O by couplings R to allow for expansion and contraction. The cold water may enter one main by a pipe S and the heated water may pass out from the other by a pipe T. The water which is circulated through the pipes O enters the main Q through the inlet S and passes through the couplings R into the pipes O, where it cools the pipes and is at the same time heated, and passes into the main Q′ and thence out through the outlet T.

The furnace may be provided with one or more air inlets U in the upper part of the furnace to permit cold air to enter the furnace and mingle with the heated products. These inlets U may be closed to regulate the quantity of cold air admitted.

The arch or crown N may be easily and economically constructed and is very durable.

While I prefer the minor details of construction shown, I do not limit my invention to them as they may be varied without departing from the invention.

Having now described my invention, what

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

In a furnace, the combination with the side walls, of the grate, a series of pipes arranged over the grate and extending through the side walls, a main upon each side connecting with the projecting ends of the pipes, a water inlet to one main, a water outlet to the other, and a layer of fire brick supported upon the series of pipes within the furnace forming therewith a closed crown or arch above the grate.

In testimony of which invention I have hereunto set my hand.

J. J. DE KINDER.

Witnesses:
R. M. HUNTER,
GEO. W. REED.