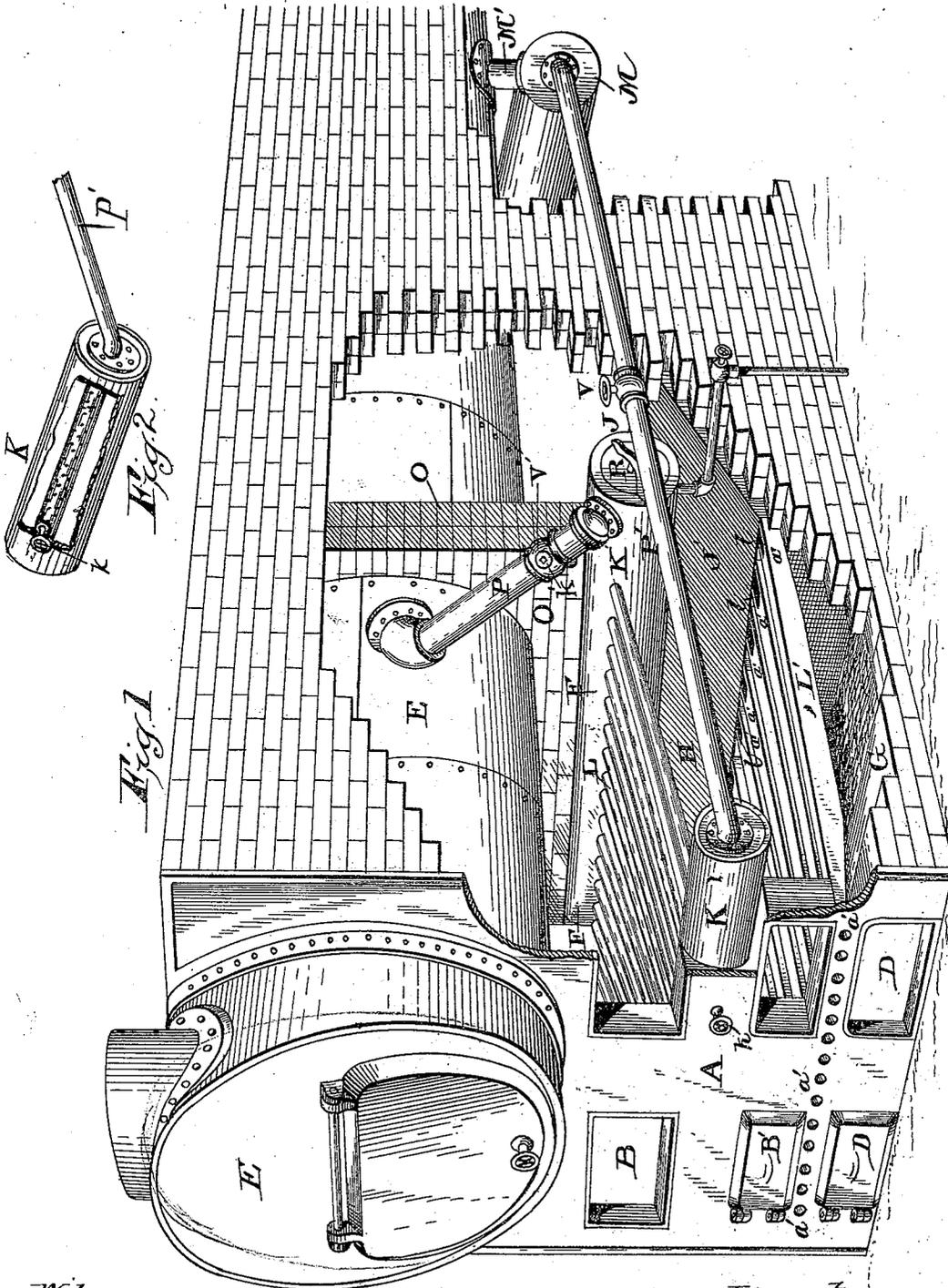


(No Model.)

C. E. SOUTHARD.
STEAM BOILER FURNACE.

No. 512,127.

Patented Jan. 2, 1894.



Witnesses:
B. R. Singleton
D. E. Singleton

Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES E. SOUTHARD, OF ST. LOUIS, MISSOURI.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 512,127, dated January 2, 1894.

Application filed August 23, 1893. Serial No. 433,873. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SOUTHARD, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Steam-Boiler Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in steam boiler furnaces, and particularly to a boiler-furnace patented to me July 17, 1888, No. 386,275, all of which will be hereinafter more particularly described and pointed out.

In the accompanying drawings forming part of this specification, Figure 1 is a perspective view of a boiler with the improvements attached; one side of the boiler casing being removed to show the improvements. Fig. 2 is a detached view of the front manifold partly broken away to show the perforated steam pipe and valve inside.

A is the fire front; B, B', the fire doors.
D, D are damper doors.
E is the boiler.
F is the fire-box.
G, is the ash-pit.
H is the gas-burning pit.
J is the combustion chamber.
J' is the rising-stope.
K is the front manifold, for the grate-bars.
K' is the rear manifold.
k' is a blow-off cock.
L are the upper grate-bars.
L' are the lower grate-bars.
M, is the mud-drum.
M' is the stand-pipe.
O is a solid screen.
P, P', are the circulating pipes.
R is the hand-hole-plate; one being in the end of each manifold.

The furnace is of the usual construction, and the improvements can be applied to any boiler and furnace now in use. The upper grates L are made of steam pipes; the ends are joined to the manifolds K and K'; the outer manifold K has within it a perforated steam pipe, controlled by a valve k outside

of the fire-front for the purpose of blowing off. Near one end of the manifold K' there is a steam pipe P which is connected to one end or the side of the boiler E in the steam-space. At the other end of the manifold K' there is a hot-water pipe P', which is connected with the mud-drum M beneath the boiler; and which drum is attached to the bottom of the boiler by the stand pipe M'.

On the pipe P' is a valve V for controlling the admission of water from the boiler. The steam-pipe P has also a valve V' for controlling the outlet of steam from the manifold K', and these valves are used also to shut off the steam and water in case of leakage anywhere in the apparatus.

Below the first set of fire bars L there is a set of hollow fire bars L' which have their front ends passing through the fire-front A, and are open to the air. At the inner ends of these bars at a', are openings l, to permit the air from the front to pass upwardly over the rising stope J' to mingle with the burning gases from the upper bars L under the manifold K'. The inner ends of bars L' are about one foot beyond the ends of the upper bars L.

I claim—

1. In boiler-furnaces having hollow grate-bars connected to front and rear manifolds, a perforated steam pipe within one of the manifolds and a controlling valve, substantially as and for the purpose described.

2. A boiler furnace having an upper tier of hollow grate-bars, connected to the front and rear manifolds; a perforated steam pipe in one of the manifolds controlled by a valve, and a lower tier of hollow grate-bars open to the outer air at the front end, and having openings at the other end, to supply fresh oxygen immediately at the bottom of the stope, all as and for the purpose described.

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

CHARLES E. SOUTHARD.

Witnesses:

GEO. W. SOUTHARD,
MAMIE SCHNAKE.