

(No. Model.)

S. S. HORNER.
BOILER FURNACE.

No. 570,995.

Patented Nov. 10, 1896.

Fig. 1.

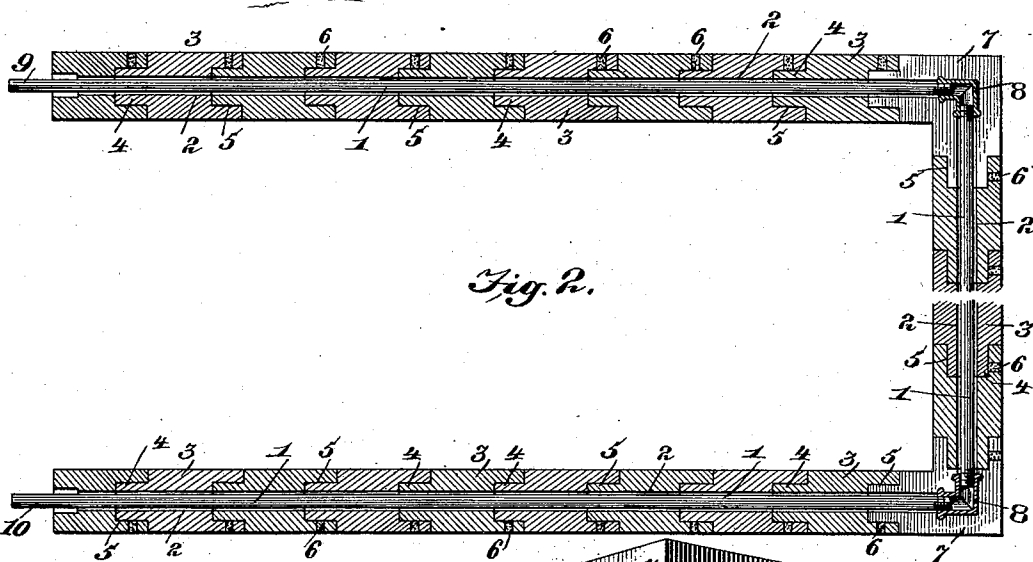
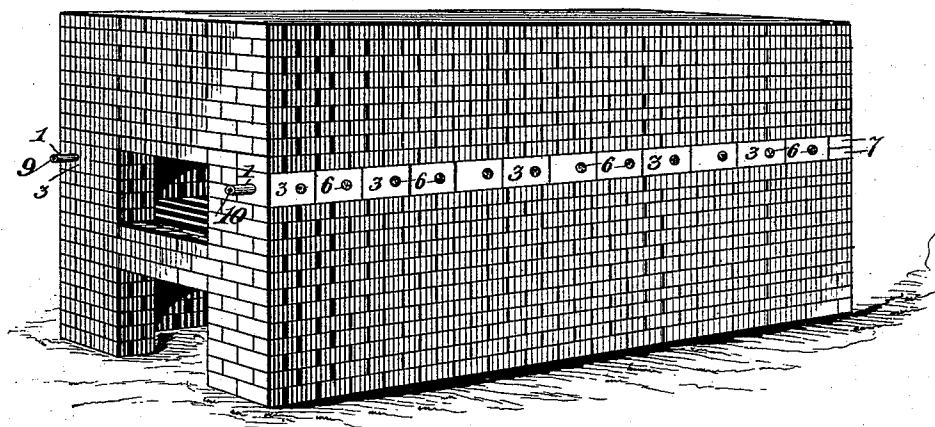


Fig. 2.

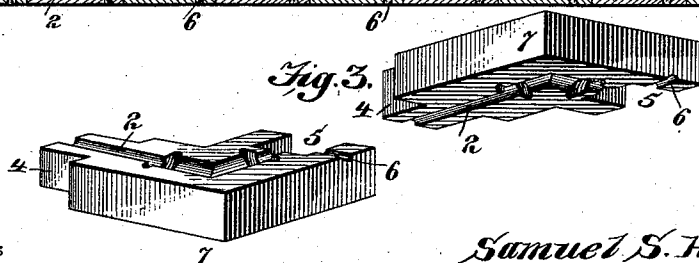


Fig. 3.

Inventor

Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL S. HORNER, OF CONEMAUGH, PENNSYLVANIA.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 570,995, dated November 10, 1896.

Application filed July 6, 1896. Serial No. 598,176. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. HORNER, a citizen of the United States, residing at Cone-
maugh, in the county of Cambria and State
of Pennsylvania, have invented a new and
useful Boiler-Furnace, of which the following
is a specification.

The purpose of this invention is to utilize
the heat of steam-boiler furnaces to the best
possible advantage and to raise the temper-
ature of the water prior to introducing it into
the boiler.

In practicing the invention a pipe is built
into the brickwork or masonry forming the
fire-box and is located at such a point as to
receive the full benefit of the heat. Inciden-
tal to this construction the walls of the fire-
box are prevented from overheating and burn-
ing and are kept comparatively cool. In order
to provide for the reception of the pipe,
a course of fire-brick of special construction
is built into the walls of the fire-box, the
brick forming the course being apertured to
receive the pipe, one end of each brick hav-
ing a projection and the contiguous end of
the adjacent brick having a corresponding
socket to receive the said projecting portion
and an opening leading from the socket form-
ing a duct for the pouring into the joint of
a liquid cement to form a bond between the
bricks.

The invention also consists of certain de-
tails of construction and novel features, which
hereinafter will be more particularly set forth,
illustrated, and finally claimed.

The improvement is susceptible of various
changes in the form, proportion, and the mi-
nor details of construction without departing
from the principle or sacrificing any of the
advantages thereof, and to a full disclosure
of the invention an adaptation thereof is
shown in the accompanying drawings, in
which—

Figure 1 is a detail view of a steam-boiler
furnace having the invention applied. Fig. 2
is a plan section of the fire-box, taken through
the course of brick in which is located the
hot-water pipe. Fig. 3 is a detail view of a
corner-brick, showing the parts separated.

Corresponding and like parts are referred
to in the following description and indicated

in the several views of the drawings by the
same reference-characters.

The invention is intended to be applied to
the fire-box of a furnace of any make having
its walls constructed of brickwork or masonry.
At a distance of about a foot above the grate-
bars a pipe 1 is let into the walls of the fire-box
and the water courses therethrough on its
way to replenish the boiler and is heated in
its travel through the pipe and around the
fire-box, thereby entering the boiler at or about
a boiling-point.

In constructing the furnace a course of
brick of peculiar construction is located at
the proper elevation above the grate-bars, so
as to receive the pipe 1, the brick entering
into the formation of this course being of
similar construction and having an opening 2,
through which the pipe 1 passes. One end of
a brick 3 is formed with a projection 4, and
the meeting end of the adjacent brick is pro-
vided with a socket 5 of corresponding shape
to the projection 4, so as to receive the latter
when the bricks are placed end to end. An
opening 6 extends outward from the socket 5
and forms a passage or duct through which is
poured a cementing solution, such as liquid
cement, to bond the bricks after being placed
together. Each brick has a projection 4 at
one end and a corresponding socket 5 at the
opposite end, thereby admitting of the bricks
being laid together and facing in the same di-
rection. The corner-bricks 7 are formed in a
similar manner to the body-bricks 3, with this
exception, that they are divisible on a line
corresponding with the opening through
which the pipe passes, so as to admit of the
cast-metal elbow 8 being readily placed in
position. This course of brick is built into
the walls of the furnace in precisely the same
manner as the ordinary fire-brick, and is lo-
cated at the required height so as to attain
the full benefit of the heat.

The water-pipe 1 will be of the kind usually
employed for purposes of this character, and
will be of a size according to the capacity of
the boiler and the quantity of water to be fed
thereto in a given time. There may be one
or more courses of the bricks 3 and as many
pipes 1 as desired. The water from the tank
or source of supply enters at 9, and after

coursing through the pipe 1 leaves at 10 and passes directly into the boiler. The water in circulating around the fire-box cools the walls thereof and prevents overheating, and in turn
5 is heated to nearly a boiling-point, and in this condition is fed to the boiler, thereby resulting in an economical consumption of fuel and utilizing of heat generally wasted.

Having thus described the invention, what
10 is claimed as new is—

1. In a boiler-furnace, the combination of a course of brick built into the walls of the fire-box a proper distance above the grate-bars, and having an opening therethrough, and a
15 water-pipe located in the opening of the course of brick, substantially as and for the purpose set forth.

2. In a boiler-furnace, the combination of a course of brick located a distance above the
20 grate-bars and built into the walls of the fire-box, and having an opening therethrough, the

end of one brick having a socket and the opposing end of the adjacent brick having a corresponding projection to enter the said socket, and a pipe extending through the opening in
25 the said course of brick, substantially as and for the purpose set forth.

3. In a boiler-furnace, the combination of a course of brick built into the walls of the fire-box a distance above the grate-bars, and hav-
30 ing an opening therethrough, the corner-bricks being divisible on a line corresponding with the opening, and a pipe located in the opening of the said course of brick, substantially as and for the purpose set forth. 35

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SAMUEL S. HORNER.

Witnesses:

GEORGE HORNER,
R. B. HORNER.