

(No Model.)

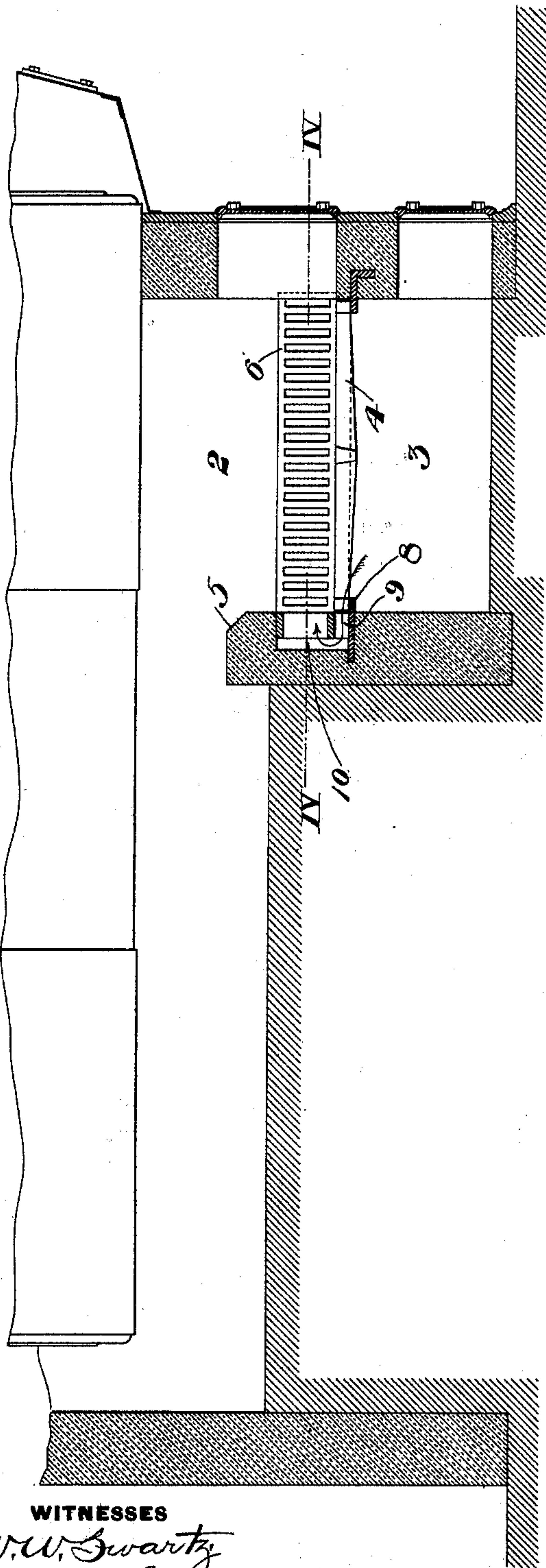
2 Sheets—Sheet 1.

R. BOW.
FURNACE.

No. 520,032.

Patented May 22, 1894.

Fig. 1.



WITNESSES

W. W. Swartz
J. M. Corwin

Fig. 2.

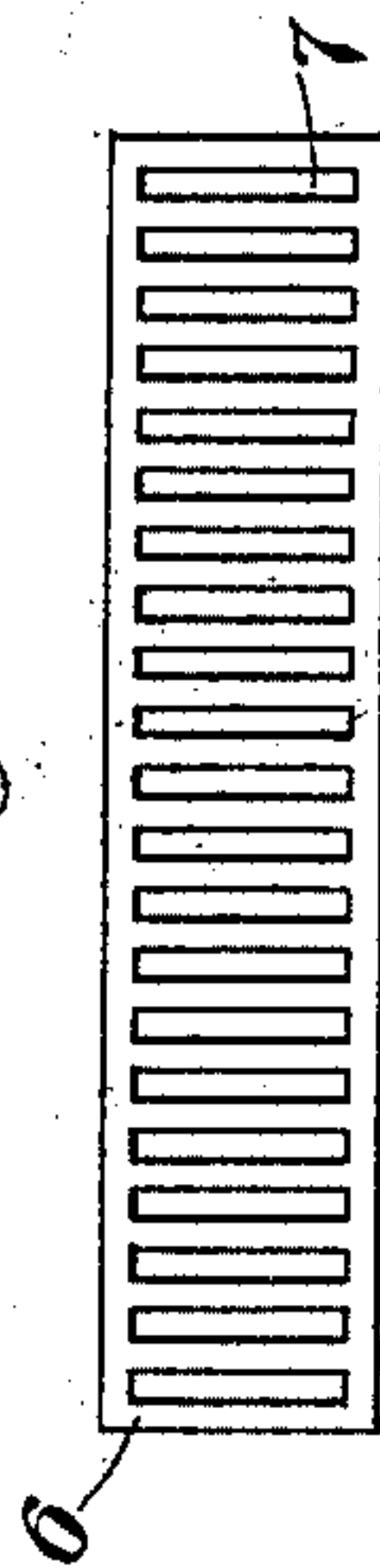
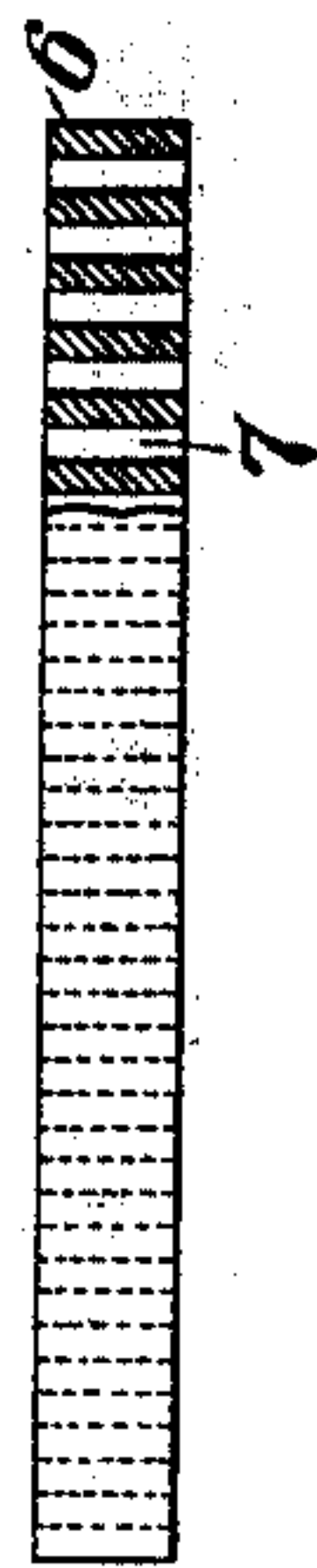


Fig. 3.



INVENTOR

Richard Bow,
by his Attorneys
W. Barwell & Son.

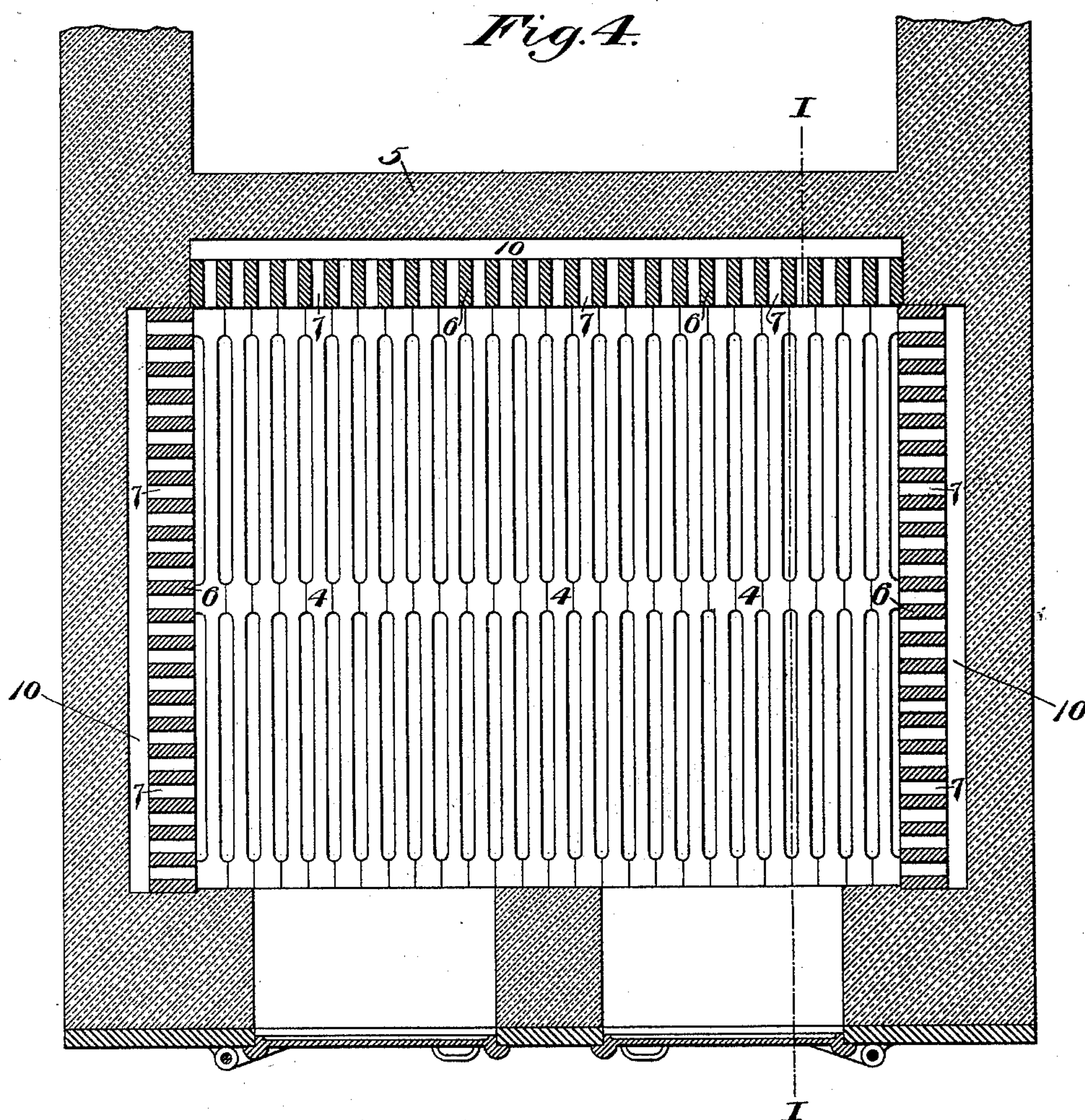
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INVENTOR

Richard Bow
by his Attorneys
W. B. Sewell & Sons.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RICHARD BOW, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS
TO RICHARD HAMPSON AND JAMES M. BROWN, OF SAME PLACE.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 520,032, dated May 22, 1894.

Application filed July 15, 1893. Serial No. 480,616. (No model.)

To all whom it may concern:

Be it known that I, RICHARD BOW, of Mc-
Keesport, in the county of Allegheny and
State of Pennsylvania, have invented a new
and useful Improvement in Furnace, of which
the following is a full, clear, and exact de-
scription, reference being had to the accompa-
nying drawings, forming part of this speci-
fication, in which—

Figure 1 shows in vertical longitudinal sec-
tion a steam-boiler furnace provided with my
improvement, the section being taken on the
line I—I of Fig. 4. Fig. 2 shows in elevation
one of the plates or castings adapted to be
set in the wall of the combustion-chamber for
the purpose of admitting and distributing air.
Fig. 3 is a top plan view thereof, partly in
horizontal section. Fig. 4 is on a larger scale,
and in horizontal cross-section on the line
IV—IV of Fig. 1.

The object of my invention is to improve
the construction of furnaces for steam-boilers
and other furnaces, and to increase their effi-
ciency and the durability of their settings.

It consists in a furnace having in some or
all of the walls, an air chamber faced with a
plate or casting provided with series of lat-
eral perforations which receive air from the
rear and discharge it into the sides of the com-
bustion-chamber.

It also consists in certain other items of in-
vention hereinafter described and stated in
the claims.

In the drawings, 2 represents the combus-
tion-chamber, 3 is the ash-pit or chamber be-
low, 4, 4, are the grate-bars, and 5 is the
bridge-wall. At three sides of the combus-
tion-chamber are plates 6, shown in detail in
Figs. 2 and 3. Each plate is preferably made
of an integral casting, and is formed with a
series of lateral holes or perforations 7 ex-
tending through the same and terminating
substantially at or below the fuel level, so
that the air which passes through the perfo-
rations, as hereinafter described, shall pass
through the bed of fuel and not over it. The
plates are set vertically on edge in recesses
in the walls of the furnace, and are support-
ed on frames or plates 8 having vertical lugs
9 which uphold the plates 6 and permit the

passage of air from the ash-pit 3 into cham-
bers 10, which are formed in the walls of the
furnace back of the plates 6 and communicate
with the perforations of said plates. In the
drawings I show the plates 6 set in three of
the walls of the furnace. This is best, but
within the scope of my invention they may
be applied to a less number of the walls. The
plates 6 are reversible, and when one face is
burned or injured they may be turned about to
bring the other face in front.

When the furnace is in use, the fuel on the
grate-bars is fed with air which passes in the
usual way up through the grate-bars, and
there is also a supplemental supply of air
which passes from the ash-pit into the cham-
bers 10 and thence through the perforations
in the plate 6 into the side portions of the
combustion-chamber and through the bed of
fuel therein. This supplemental air-supply
is heated to some extent by passage through
the plate, and it not only enhances the com-
bustion of fuel, thus acting as a smoke-con-
sumer, and securing greater economy in the
operation of the furnace, but it tends to pre-
serve the walls of the combustion-chamber
and to prevent their rapid destruction by the
burning fuel.

Within the scope of my invention as defined
in the claims, various modifications in the
form and relative arrangement of the parts
may be made by the skilled mechanic.

The advantages of my invention will be ap-
preciated by those skilled in the art. The
apparatus is simple in construction, easy to
apply, and the economy in fuel and saving in
deterioration of the furnace which it occa-
sions, are of great benefit. The invention is
applicable, not only to steam-boiler furnaces,
but to furnaces of other construction and used
for other purposes.

I claim—

1. A furnace having above the grate-bars
an air-chamber formed in the furnace wall,
and a perforated removable plate interposed
between the air-chamber and the combustion-
chamber and adapted to permit passage of
air into the bed of fuel in the latter, said
plate being supported above the base of said
air-chamber to afford an air passage leading

transversely from beneath the grate-bars into said chamber back of the plate; substantially as described.

2. A furnace having above the grate bars
5 an air chamber formed in the furnace wall, a perforated reversible plate interposed between the air-chamber and the combustion-chamber, and adapted to permit passage of air into the bed of fuel in the latter, and a

supporting plate 8, having lugs which uphold said plate above the base of the air-chamber; substantially as described.

In testimony whereof I have hereunto set my hand.

RICHARD BOW.

Witnesses:

HOWARD SOLES,

JAMES M. BROWN.