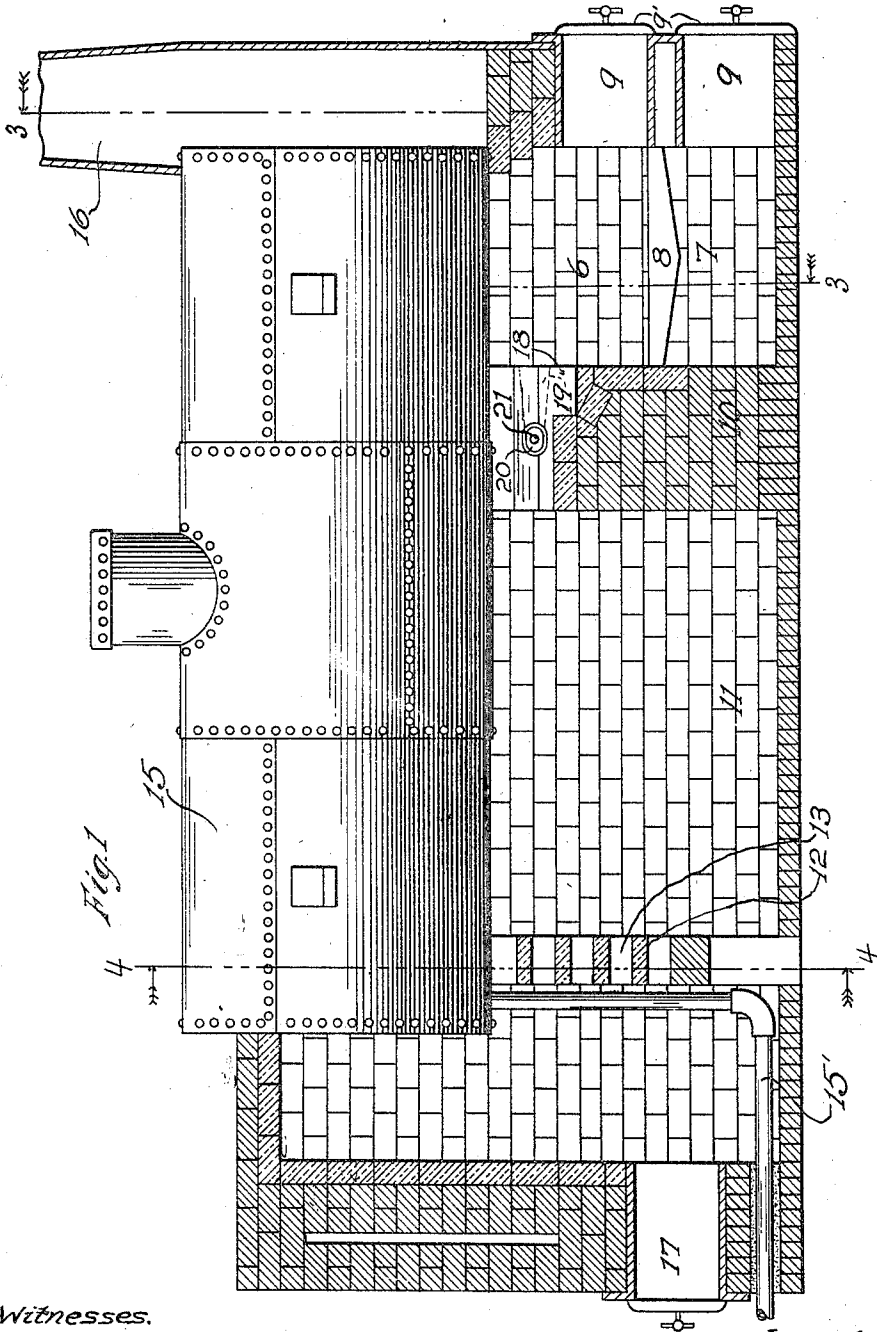


S. O. BERG.
SMOKE CONSUMING FURNACE.
APPLICATION FILED MAR. 23, 1912.

1,043,895.

Patented Nov. 12, 1912

3 SHEETS—SHEET 1.



Witnesses.
N. Brandt.
Thomas Colson.

Inventor:
Sven O. Berg
By Joshua R. Torrey
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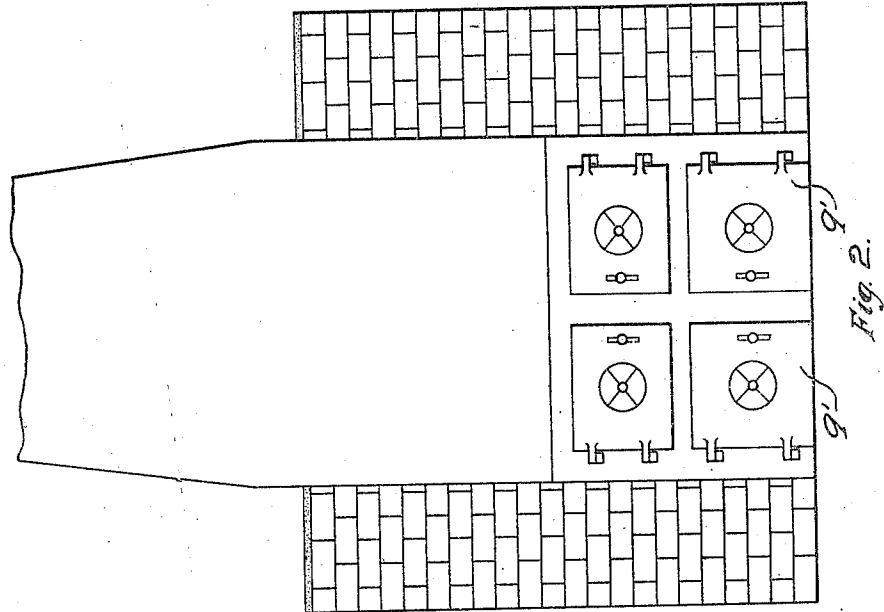


Fig. 2.

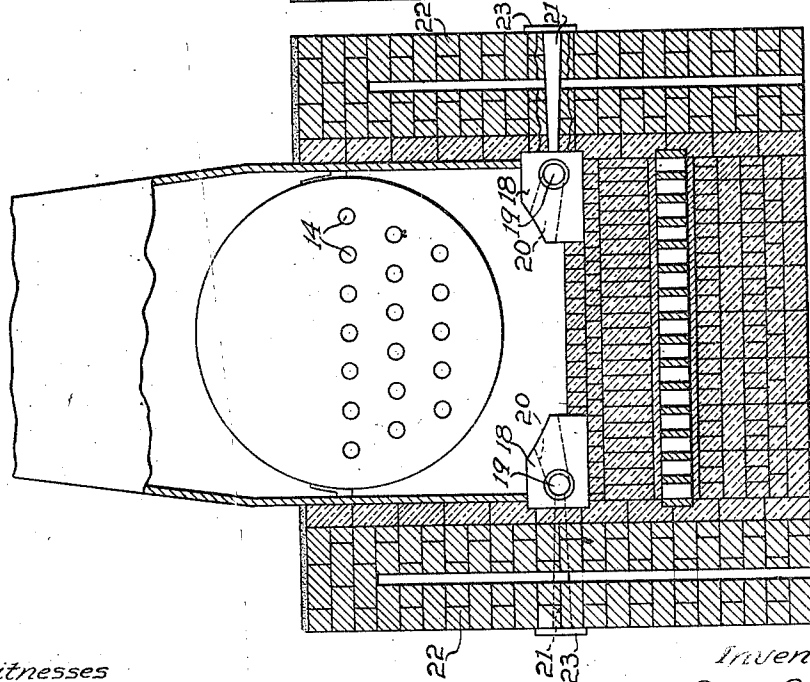


Fig. 3.

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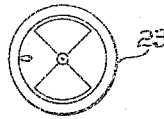
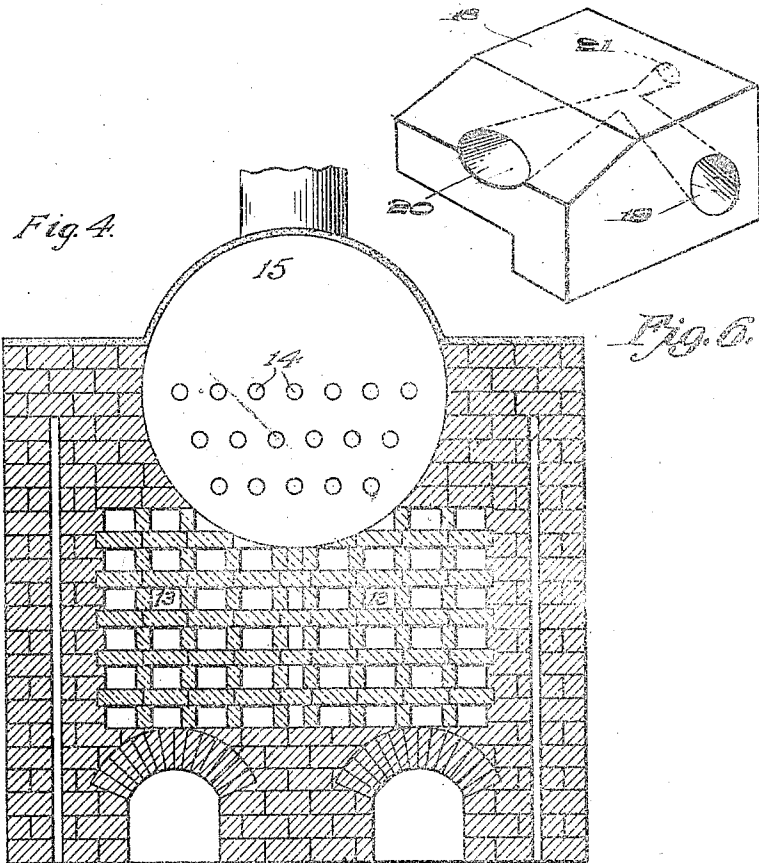


Fig. 5.

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UNITED STATES PATENT OFFICE.

SVEN O. BERG, OF CHICAGO, ILLINOIS.

SMOKE-CONSUMING FURNACE.

1,043,895.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed March 23, 1912. Serial No. 685,675.

To all whom it may concern:

Be it known that I, SVEN O. BERG, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

My invention relates to furnaces for the prevention of the formation of smoke, and the object being to provide a device of this character which will be of simple construction and efficient in operation.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which—

Figure 1 is a sectional elevation of a furnace equipped in accordance with my invention, Fig. 2 is a front elevation of the same, Fig. 3 is an irregular vertical section of the same, Fig. 4 is a vertical section taken through the perforated wall near the rear portion of the furnace, Fig. 5 is a side elevation illustrating the throttling valve for admitting auxiliary air into a furnace equipped with my device, and Fig. 6 is a detail perspective view illustrating more clearly one of the reflecting members.

Like numerals of reference indicate like parts throughout the several views.

The preferred form of construction, as illustrated in the drawings, comprises a furnace having a conventional fire box 6 and ash pit 7 separated by the grate bars 8 and provided with door-openings 9 closed with doors 9'. The furnace is also provided with a conventional bridge wall 10 and compartment 11. Near the rear end of such compartment is formed a wall 12 having a plurality of perforations 13 by which the resultant gases of combustion are separated and allowed to come together again after passing through such perforations to re-mix before passing through tubes 14 of a boiler 15. Such furnace is also provided with a conventional smoke-stack 16 and man-hole 17 for cleaning out the rear portion of said furnace. The boiler 15 is provided with a conventional clean-out pipe 15'.

Formed on the bridge wall 10 in proximity with the sides of the furnace, are reflecting members 18 provided with longi-

tudinal funnel shaped passages 19 and angular funnel shaped passages 20 fashioned in a manner to receive gases from the sides of the furnace and deliver them transversely over the central portion of said bridge wall. Ducts 21 extending through walls 22 of the furnace, are connected with the reflecting members 18 in a manner to deliver outside air into such reflecting members to be discharged with the gases discharged from such reflecting members. The funnel shaped passages 19, 20 and 21 are connected at their smallest portions so that the gases passing through the passages 19 and 20 will have their greatest velocity at the time outside air is introduced through duct 21 into said passages, thus insuring thorough mixture of the introduced air into such gases. Situated in such ducts are valves 23 for limiting the amount of air admitted through said ducts.

The operation of this device is as follows: Gases emanating from the side portions of the fire box will be collected by the passages 19 of the reflecting members 18 and discharged through the passages 20 into the portion of gases coming from said fire box which pass over the central portion of the bridge wall. Such gases will be laden with the new supply of outside air brought in through ducts 21 and after being superheated by the gases in such reflecting members, will stimulate combustion of the gases passing over the central portion of such bridge wall, producing a perfect combustion, thereby preventing the formation of smoke. The wall 12 provided with the small perforations 13, serves as a means for dividing the gases again as they pass through this wall, and in their coming together again they will mix with different particles of the same gases, thereby producing better combustion before passing through the tubes 14 of the boiler. By this arrangement, smoke is prevented by producing a perfect combustion of the fuel.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the exact details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a furnace of the kind described the
5 combination with a fire box and a bridge
wall in the line of draft of said furnace, of
members on said bridge wall against the
side walls of said furnace, each of which is
10 provided with passages therethrough to col-
lect gases from the side of said fire box and
deliver them transversely of such fire box
over the central portion of the bridge wall,
there being a restriction in the intermediate
15 portion of each of said passages; and a
means for admitting outside air in said pas-
sages at the point of greatest restriction,
substantially as described.

2. In a furnace of the kind described the
20 combination with a fire box and a bridge
wall in the line of draft of said furnace, of
members on said bridge wall against the
side walls of said furnace, each of which is
provided with an inwardly tapering pas-
25 sage leading into such member from the fire
box in a line parallel with the side wall of
said furnace and a second inwardly taper-
ing passage leading from the inner end of
said first mentioned passage out over the
bridge wall; and a third inwardly tapering

passage communicating with the smaller 30
ends of each of said first mentioned pas-
sages and with the outside atmosphere, sub-
stantially as described.

3. In a furnace of the kind described the
35 combination with a fire box and a bridge
wall in the line of draft of said furnace, of
members on said bridge wall against the
side walls of said furnace each of which
is provided with an inwardly tapering pas-
40 sage leading into such member in a line par-
allel with the side wall of said furnace and
a second inwardly tapering passage leading
from the inner end of said first mentioned
passage in a line perpendicular with said
45 first mentioned passage and out over the
bridge wall; a third inwardly tapering pas-
sage communicating with the smaller ends
of each of said first mentioned passages and
with the outside atmosphere; and means for
50 regulating the passage of air through said
three passages, substantially as described.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

SVEN O. BERG.

Witnesses:

JOSHUA R. H. POTTS,
BRAYTON G. RICHARDS.