

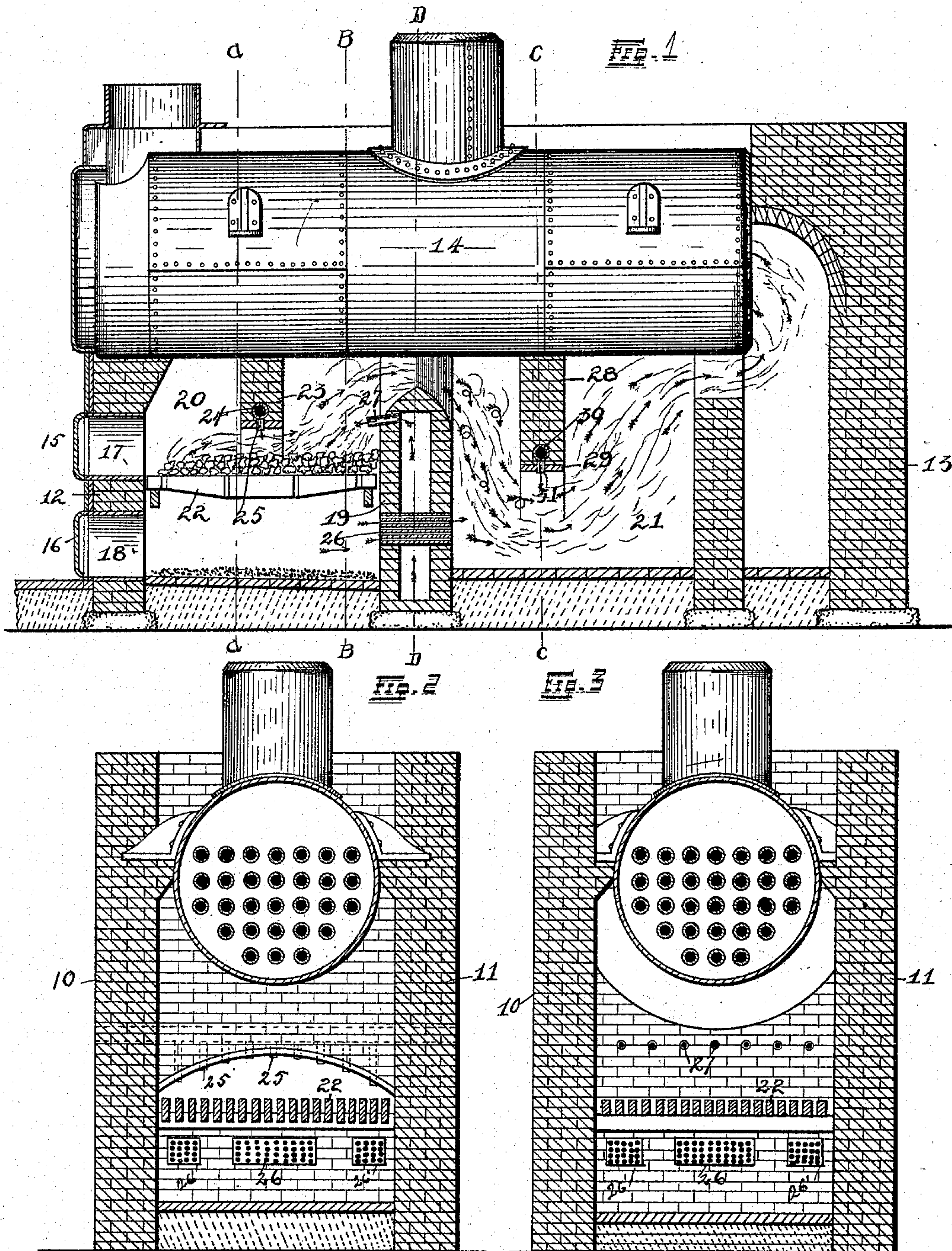
(No Model.)

2 Sheets—Sheet 1.

M. McCARTHY.
SMOKELESS BOILER FURNACE.

No. 527,532.

Patented Oct. 16, 1894.



Witnesses

A. H. Chapman.
Thos. C. Flaherty.

Inventor

Michael M. McCarthy
By *Edwin Robinson* Attorneys

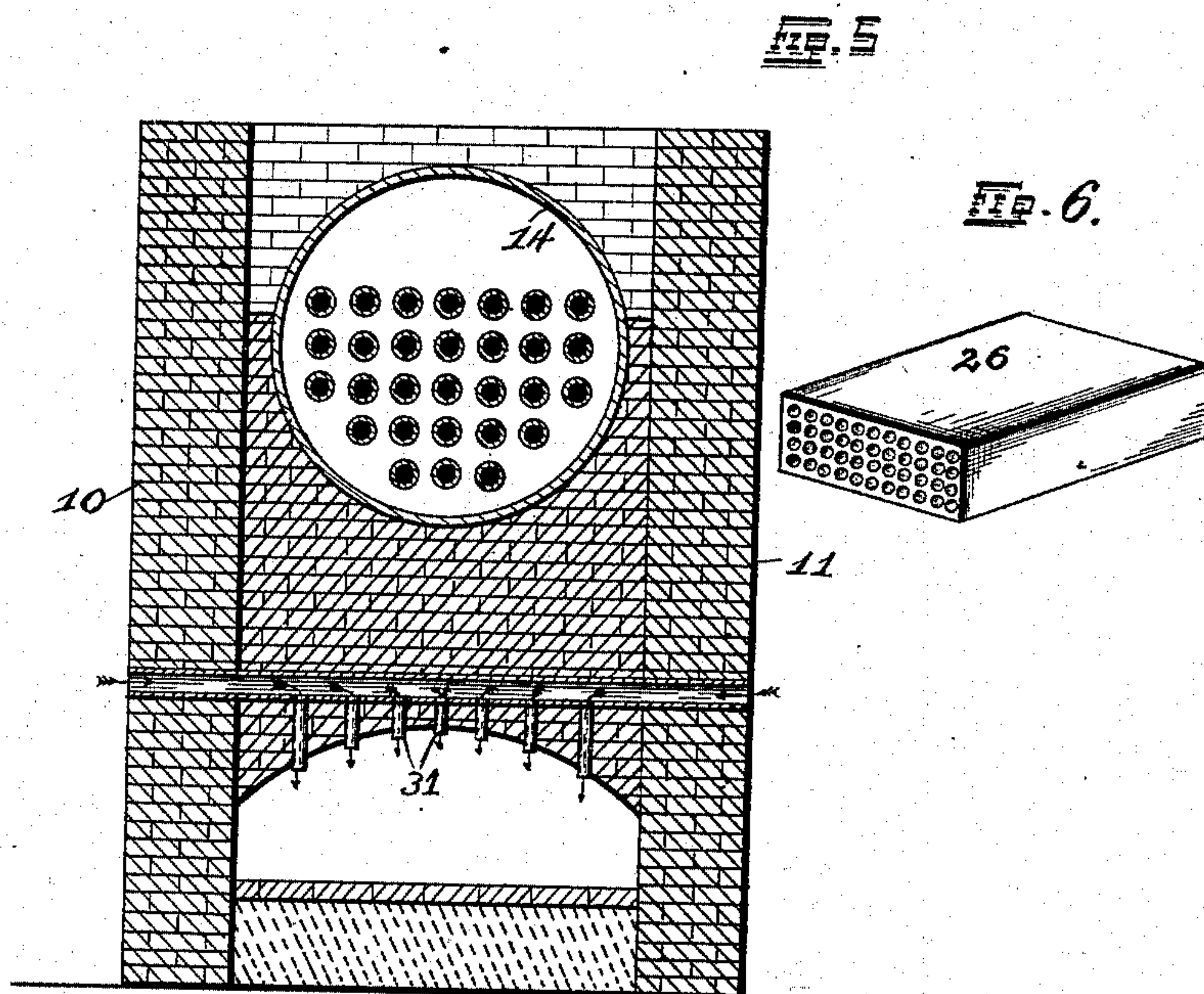
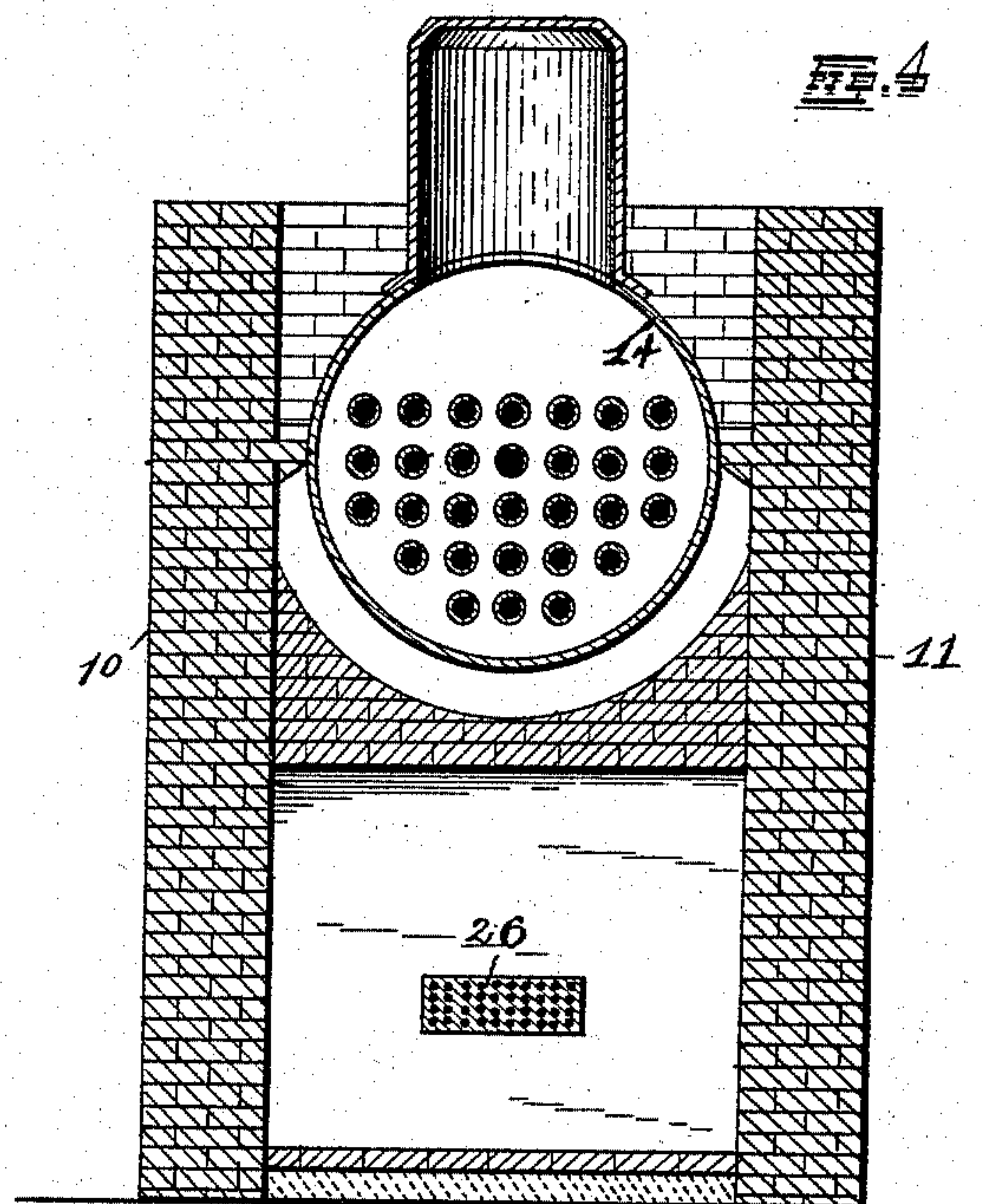
(No Model.)

2 Sheets—Sheet 2.

M. McCARTHY.
SMOKELESS BOILER FURNACE.

No. 527,532.

Patented Oct. 16, 1894.



Witnesses
A. H. Chapman.
Thos. C. Flaherty.

Inventor,
Michael M. McCarthy,
By *Edwin Robinson* Attorneys

UNITED STATES PATENT OFFICE.

MICHEAL MCCARTHY, OF ST. LOUIS, MISSOURI.

SMOKELESS BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 527,532, dated October 16, 1894.

Application filed June 7, 1894. Serial No. 513,755. (No model.)

To all whom it may concern:

Be it known that I, MICHEAL MCCARTHY, a citizen of the United States, and a resident of St. Louis, State of Missouri, have invented certain new and useful Improvements in Smokeless Boiler-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

10 The object of this invention is to be found in the provision of improved means for aiding in the consumption of the products of combustion emanating from a coal fire.

15 This invention consists in the combination with the fire box and bridge-wall of a plurality of air passages through the bridge-wall affording communication between the ash-pit and the hot-air room, a plurality of air passages from the exterior to the interior of the 20 combustion chamber or fire box above the central portion of the grate and a plurality of air passages from the exterior of the furnace to the interior of the hot-air room, the several air passages tending to commingle with the 25 products of combustion, a series of currents of atmospheric air of a lower temperature than the said products of combustion, and by means of such commingling create an inflammable gas to be consumed within the furnace and in 30 its consumption destroy the offensive gases, soot and heavy smoke, which otherwise would be discharged into and through the chimney.

This invention consists further in the construction, arrangement and combination of 35 elements, hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

40 Figure 1 is a central longitudinal sectional elevation of a furnace equipped with my invention. Fig. 2 is a transverse sectional elevation on the line A—A of Fig. 1. Fig. 3 is a transverse sectional elevation on the line B—B of Fig. 1. Fig. 4 is a transverse sectional elevation on the line D—D of Fig. 1. 45 Fig. 5 is a transverse sectional elevation on the line C—C of Fig. 1. Fig. 6 is a perspective view of one of the registers employed in my device.

50 In the construction of the furnace as shown, the numerals 10, 11 designate the side walls, 12 the front wall, 13 the back wall, and 14 the

boiler of a furnace, which parts are of ordinary construction.

Mounted in the front wall of the furnace are doors 15, 16, adapted to close the entrance 55 to fuel and waste passages 17, 18, respectively.

Located on the interior of the furnace, beneath the boiler 14 and extending between and in engagement with the walls 10, 11, is a hollow bridge wall 19, the positioning of which 60 bridge-wall subdivides the interior of the furnace into what I shall term the combustion chamber or fire box 20 and the hot-air room 21.

The floor of the combustion chamber 20 is preferably inclined rearwardly. 65

Horizontally positioned in the combustion chamber 20 is a grate 22 and located immediately above the central portion of the grate and extending transversely of said combustion chamber, parallel with the front wall of 70 the furnace is a partition 23 which serves to subdivide the upper portion of the combustion chamber into two compartments. Mounted in the partition wall 23 and extending through the walls 10, 11, and into communication with 75 the atmosphere outside the furnace is a pipe 24 open at both ends and provided with lateral ways or wings 25 leading downward therefrom through an arch plate 26 by means of which the partition is supported. Mounted 80 transversely of the lower portion of the bridge-wall 19 is a plurality of registers 26 preferably formed of clay tiling, having open ends communicating respectively with the lower 85 portion of the combustion chamber 20 and the lower front portion of the hot-air chamber 21. The register 26 is located in the center of the lower portion of the hollow bridge wall, and ports of communication are provided between 90 the ash pit, and the combustion chamber 20. Located on each side of the register 26, are registers or perforated tiles 26', and its ports of communication are provided between the ash pit, and the interior of the bridge wall 19.

Pipes 27, 27, are provided in the upper portion 95 of the bridge-wall 19 which pipes afford communication between the interior of the bridge-wall and the upper portion of the combustion chamber in the rear of the partition 23. 100

A partition 28 is located beneath the boiler 14 and extends transversely of the central por-

tion of the hot-air room 21, which partition rests upon and is supported by an arch-plate 29. The partition 28 contains a tube 30 open at both ends and communicating at its ends
5 with the exterior of the furnace and at its body portion with the interior of the hot-air room through the lateral ways or wings 31.

In the practical use of this invention, combustion being performed on the grate 22 and
10 disseminating heat, smoke, soot and gases, vertically and rearwardly from said grate, atmospheric air is introduced through the pipe 24 and wings 25 into contact with the products of combustion immediately above the
15 grate, and atmospheric air is introduced into contact with the products of combustion through the outer registers 26, bridge-wall 19 and pipes 27 at the rear end of the grate 22 whereby the products of combustion are
20 merged into a gas adapted for consumption within the combustion chamber. Those products of combustion which pass beyond the bridge-wall contact with the partition 28 and are deflected thereby downwardly and be-
25 neath said partition and are caused to mingle with currents of atmospheric air introduced through the central register 26 and the pipe 30 and wings 31 in said partitions, whereby an inflammable gas is produced
30 which igniting from the influence of the heat emanating from the combustion chamber is consumed within the hot-air chamber.

I claim as my invention—

1. In a smokeless boiler furnace comprising
35 ing a hollow bridge wall, perforated tiles secured in the one half of the bridge wall for means to allow the air to pass from the ash pit, into the hollow bridge wall, and a perforated tile to allow the air to pass directly through the

bridge-wall, from the ash pit, to the combustion chamber in the rear, small pipes or tubes secured in the upper part of the hollow bridge-wall, an air passage in an arch, located over the fire chamber, and a series of tubes connecting said air passage, to bring the air over
45 the fire, substantially as shown and for the purpose described.

2. A smokeless boiler furnace comprising side walls 10, 11, a front wall 12, having fuel and waste passages and doors therein a back
50 wall 13, a boiler 14, a hollow bridge-wall 19 intermediate of the front and back walls, a grate connecting the front wall and bridge-wall, a partition 23 depending from the boiler above the grate, a pipe 24 mounted in said
55 partition and communicating with the exterior of the furnace, wings 25 leading from said pipe to the interior of the combustion chamber, registers mounted in the bridge-wall and communicating with the lower por-
60 tion of the combustion chamber and hot-air room and the interior of the bridge-wall, pipes leading from the interior of the bridge-wall to points above the grate, a partition 28 depending from the boiler in the rear of the bridge-
65 wall, the lower edge of which partition is below the top of the bridge-wall, a pipe mounted in the partition 28 and communicating with the exterior of the furnace, and wings 31 affording communication between the pipe and
70 the hot-air room, arranged and combined as set forth.

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

MICHAEL MCCARTHY.

Witnesses:

ALFRED A. EICKS,
HERBERT S. ROBINSON.