

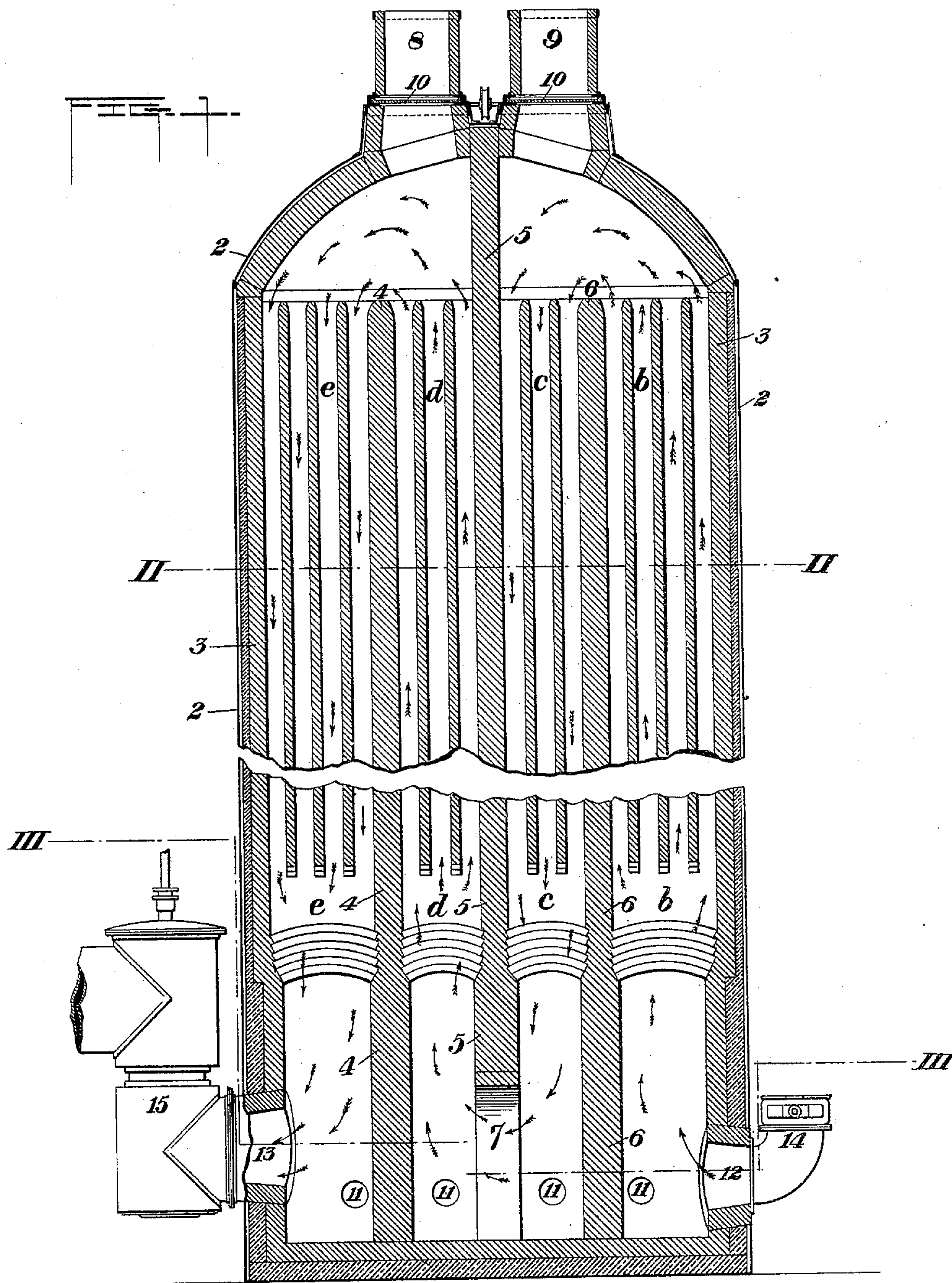
(No Model.)

3 Sheets—Sheet 1.

H. KENNEDY.  
HOT BLAST STOVE.

No. 429,725.

Patented June 10, 1890.



WITNESSES

*J. K. Smith*  
*H. L. Gill*

INVENTOR

*Hugh Kennedy*  
*by W. Baxwell How*  
*his Attorneys -*



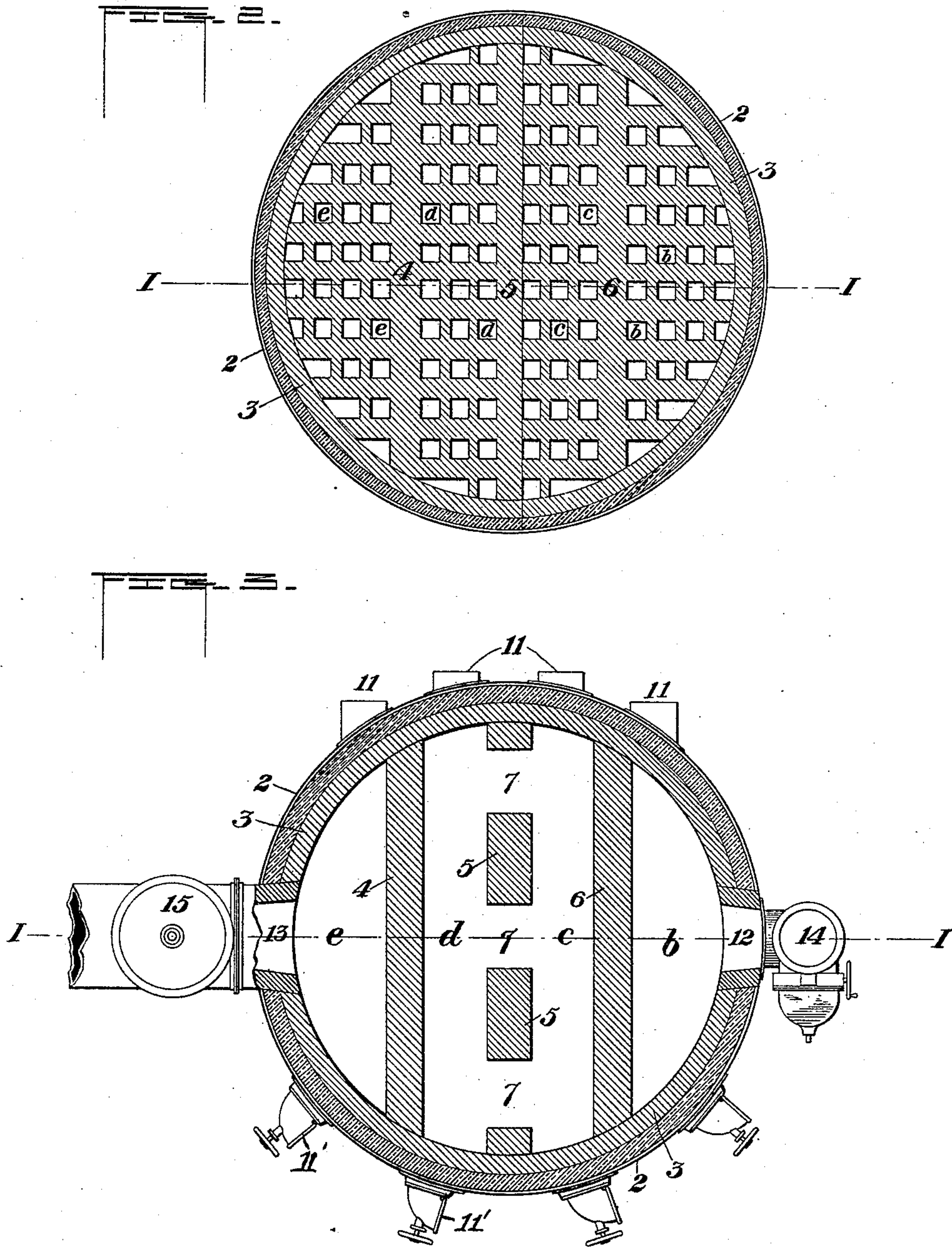
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*by W. Baxendale & Sons*  
*his Attorneys*



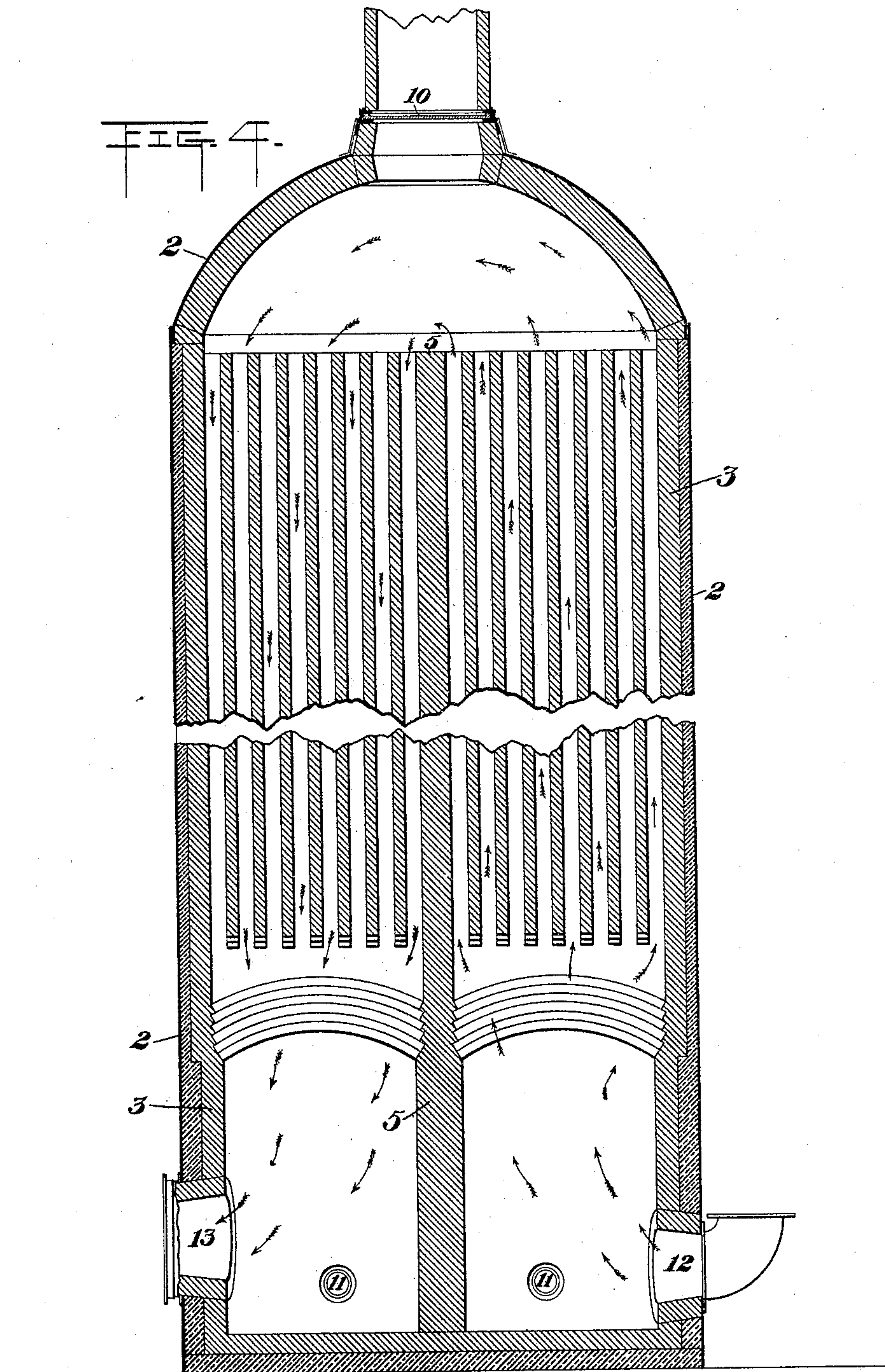
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3 Sheets—Sheet 3.

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*J. K. Smith*  
*H. L. Gill*

INVENTOR

*Hugh Kennedy*  
*by W. B. Russell & Sons*  
*his Attorneys*



# UNITED STATES PATENT OFFICE.

HUGH KENNEDY, OF SHARPSBURG, PENNSYLVANIA.

## HOT-BLAST STOVE.

SPECIFICATION forming part of Letters Patent No. 429,725, dated June 10, 1890.

Application filed September 27, 1889. Serial No. 325,271. (No model.)

*To all whom it may concern:*

Be it known that I, HUGH KENNEDY, of Sharpsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Hot-Blast Stoves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical central section of my improved stove on the line I I of Figs. 2 and 3. Fig. 2 is a horizontal cross-section on the line II II of Fig. 1. Fig. 3 is a horizontal cross-section on the line III III of Fig. 1. Fig. 4 is a vertical central section of a modified form of the stove.

Like symbols of reference indicate like parts in each.

My invention relates to vertical hot-blast stoves which are heated by the waste gases from the furnaces and are utilized to heat the blast. These stoves are provided with valves for reversing the currents by which they are traversed, so that at one time the waste heat from the furnace is passing through them in one direction, and later the blast of air from the blowing-engine is being forced through them in the opposite direction into the furnace. They are used in couples, so that while the waste heat is passing out through one or more, heating them up, the blast is being forced in through an equal number, which have been previously heated by the passage therethrough for a time of the hot waste gases. When one set becomes heated and the other cold by the currents passing through them, the valves are reversed, and then the currents pass in the opposite directions.

My invention relates to that class of stoves in which the interior is composed of a series of vertical channels through refractory brick-work and designed to give a long run to the gases and air over the same for the purpose of taking up from the hot gases all the heat contained therein and to impart the same in turn to the inflowing air.

Referring to the figures on Sheets 1 and 2 of the drawings, the stove has a cylindrical metallic shell 2, lined with brick work 3. The stove is divided into several passes by a number of vertical partition-walls 4, 5, and 6, of

which I have shown three, thus dividing the stove into four passes, though it should be understood that my invention is not limited strictly to this number of passes, since by suitable modifications, such as will suggest themselves to skilled blast-furnace engineers, the construction may be modified so that the stove shall afford other numbers of passes. Each of the passes *b*, *c*, *d*, and *e* is preferably divided into numerous small passages or flues by brick work arranged in the manner shown in Figs. 1 and 2, or otherwise, and below this brick work the flues are open to form combustion-chambers, in which gas and air are burned for the purpose of heating the stove. The walls 4, 5, and 6 are arranged so as to afford communication between the flues *b c d e* at alternate ends thereof. Thus the walls 4 and 6 extend from the bottom of the stove toward but not to the top, while the wall 5 extends to the top, and at the base is provided with arched openings 7, connecting the flues *c* and *d*. On each side of the partition-wall 5, at the top of the stove, is a stack-flue or chimney 8 9, each of which has a suitable valve 10, and at the base of the stove are pipes 11, for the admission of the gas and air by which the stove is heated as a preliminary to forcing the blast there-through. I have shown four of these gas and air inlet-pipes, one for each of the vertical passes of the stove; but, if desired, a single inlet-pipe may be used for both of those flues which communicate at the base—*i. e.*, the flues *c* and *d*.

11' are man-holes, by which access may be had to the interior of the lower part of the stove for cleaning it.

The stove is also provided with the usual adit-pipe 12, leading from the air-blowing engine, and an exit-pipe 13, leading to the blast-furnace. These pipes communicate with valve-chambers 14 and 15 of the usual construction.

In the operation of the stove the vertical flues are first heated by admitting air and gas through the pipes 11 and burning the gas in the combustion-chambers at the bases of the flues. The burning gases ascend through each of the flues *b c d e* and escape directly therefrom through the stacks 8 and 9, the stack 8 serving to carry off the products of



combustion from the flues *d e* on one side of the vertical wall 5, and the stack 9 to perform the same function for the flues on the other side of this wall. When the stove has been properly heated, the air and gas are shut off from entering the pipes 11, the valves 10 are closed, the valves 14 and 15 opened, and the air-blast is admitted through the valve-chamber 14. The air passes in succession through the several flues *b, c, d,* and *e*, as shown by the arrows in Fig. 1, and escapes through the flue 13, leading to the blast-furnace, thus passing through the entire heating-space of the stove and utilizing the whole thereof in supplying heat to the blast.

In Fig. 4 the construction of the furnace is the same as that above described, except that instead of having four passes for the air there are but two passes, there being but a single internal partition-wall 6 extending toward but not up to the top of the stove. This is desirable for some reasons, principally because as the vertical wall does not extend to the top its expansion and contraction in the heating of the stove will not displace or injure the arch or crown. The fact that there is only one stack-opening in the arch makes the stove easy to construct and makes it strong and durable.

It will be seen that the construction of Fig. 1 is a duplication of that of Fig. 4, in that while in Fig. 4 I show but one pair of flues communicating at the crown of the furnace and having a common stack-flue, in Fig. 1 I show two such pairs separated by the central wall 5.

The feature of construction in which my invention consists is the construction of the stove with at least a pair of flues separated by a vertical flue-wall and communicating at the upper portion of the stove, said flues hav-

ing air and gas inlets at their bases, a common outlet at the top and an air-blast inlet and outlet from and to which the air passes in series through the flues.

Within the limits of the construction above stated the stove may be modified in form in various ways.

The advantages of my invention will be appreciated by those skilled in the art. The stove is simple and cheap in construction, and by reason of the direct passes for the gas it is easy to heat, is economical in the amount of gas necessary to be consumed, and is otherwise very desirable.

I claim as my invention—

1. In a hot-blast stove, the combination of a pair of flues separated by a vertical flue-wall and communicating at the upper portion of the stove, said flues having air and gas inlets at their bases, a common outlet at the top, and an air-blast inlet and outlet from and to which the air passes in series through the flues, substantially as and for the purposes described,

2. In a hot-blast stove, the combination of a pair of flues separated by a vertical flue-wall and communicating at the crown of the stove above said wall, said flues having air and gas inlets at their bases, a common outlet at the top, and an air-blast inlet and outlet from and to which the air-blast passes in series through the flues, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 20th day of September, A. D. 1889.

HUGH KENNEDY.

Witnesses:

W. B. CORWIN,  
JNO. K. SMITH.