

(No Model.)

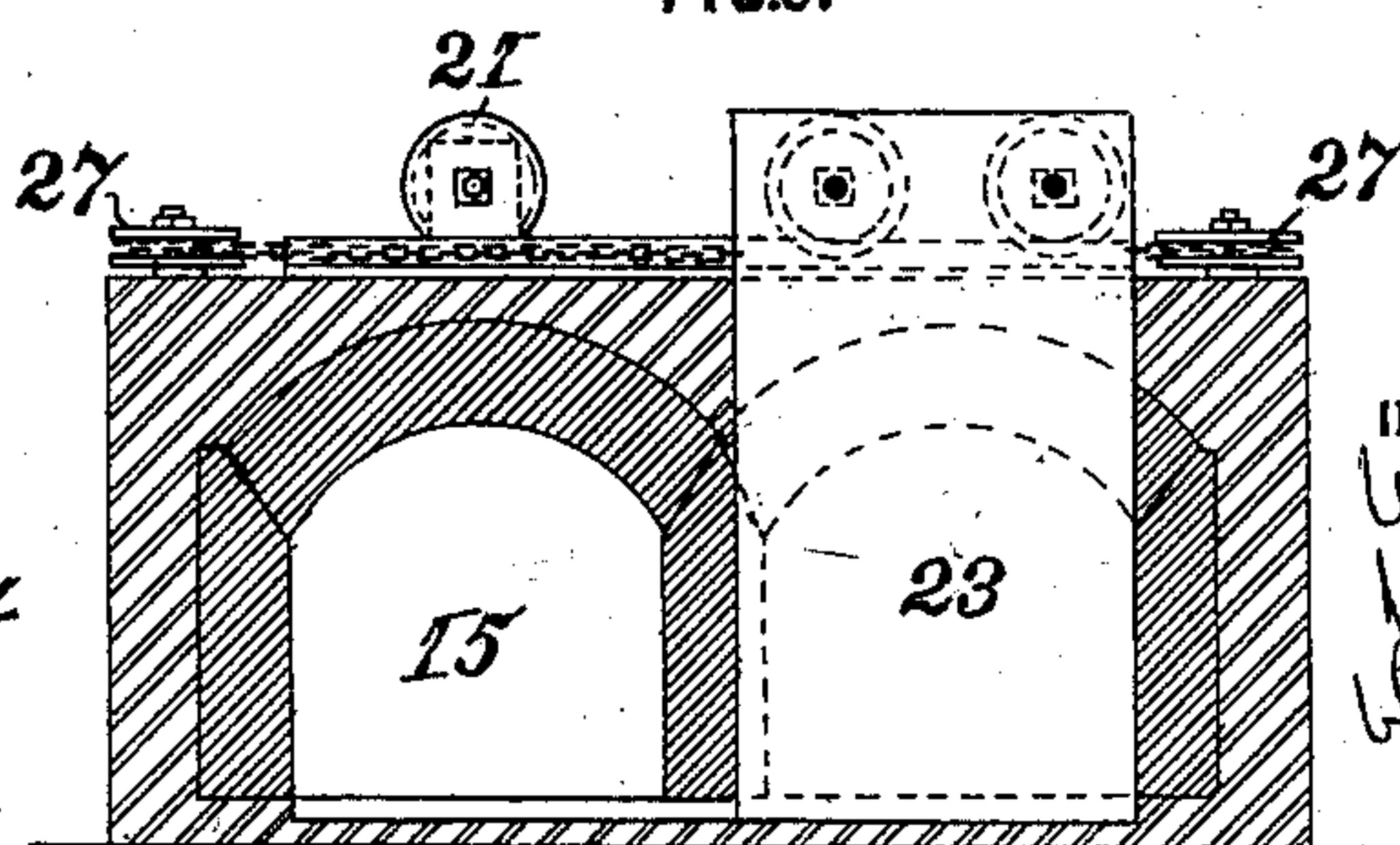
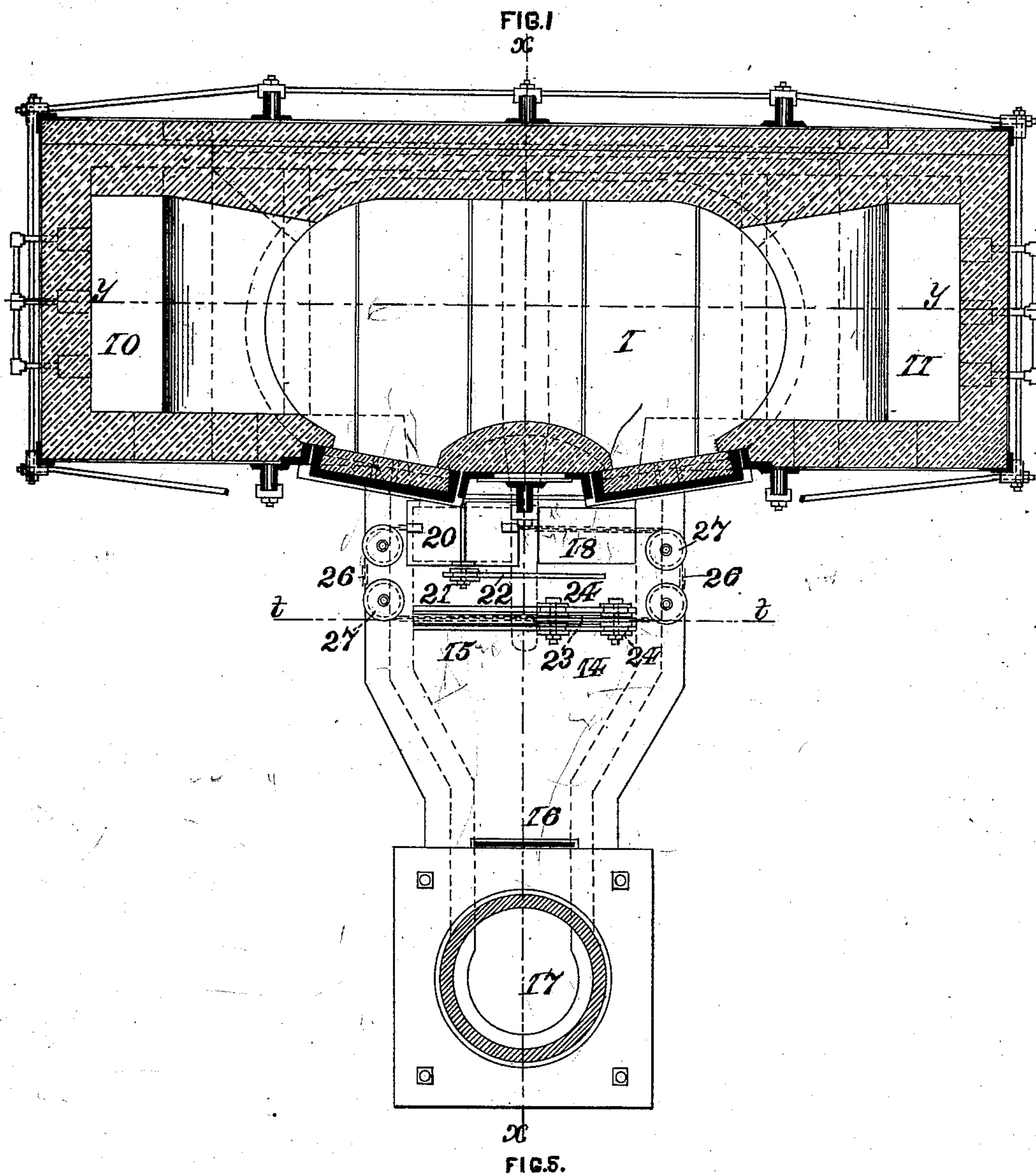
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W. & J. C. SWINDELL.

REGENERATIVE FURNACE.

No. 389,671.

Patented Sept. 18, 1888.



WITNESSES:

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(No Model.)

3 Sheets—Sheet 2.

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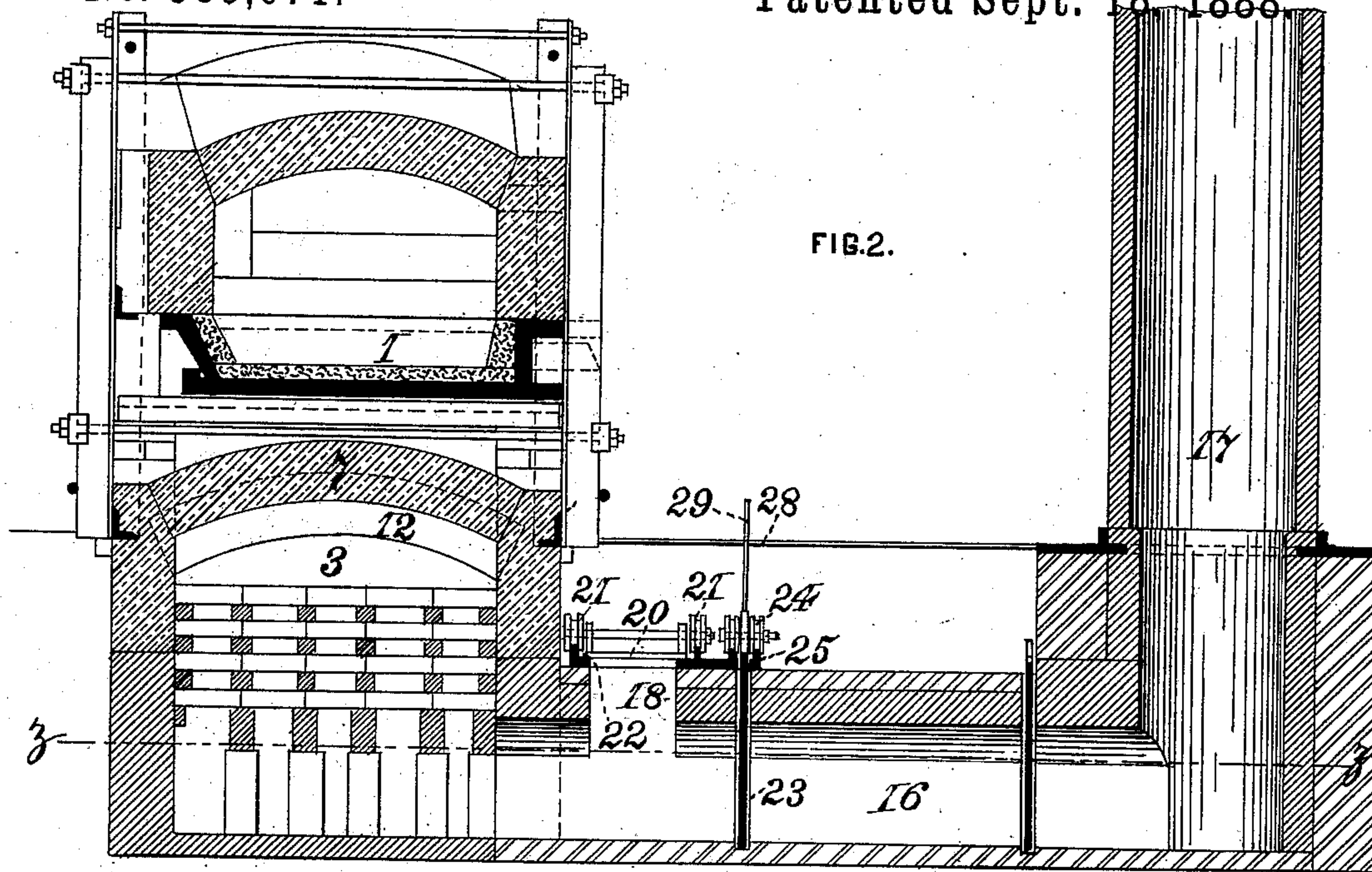
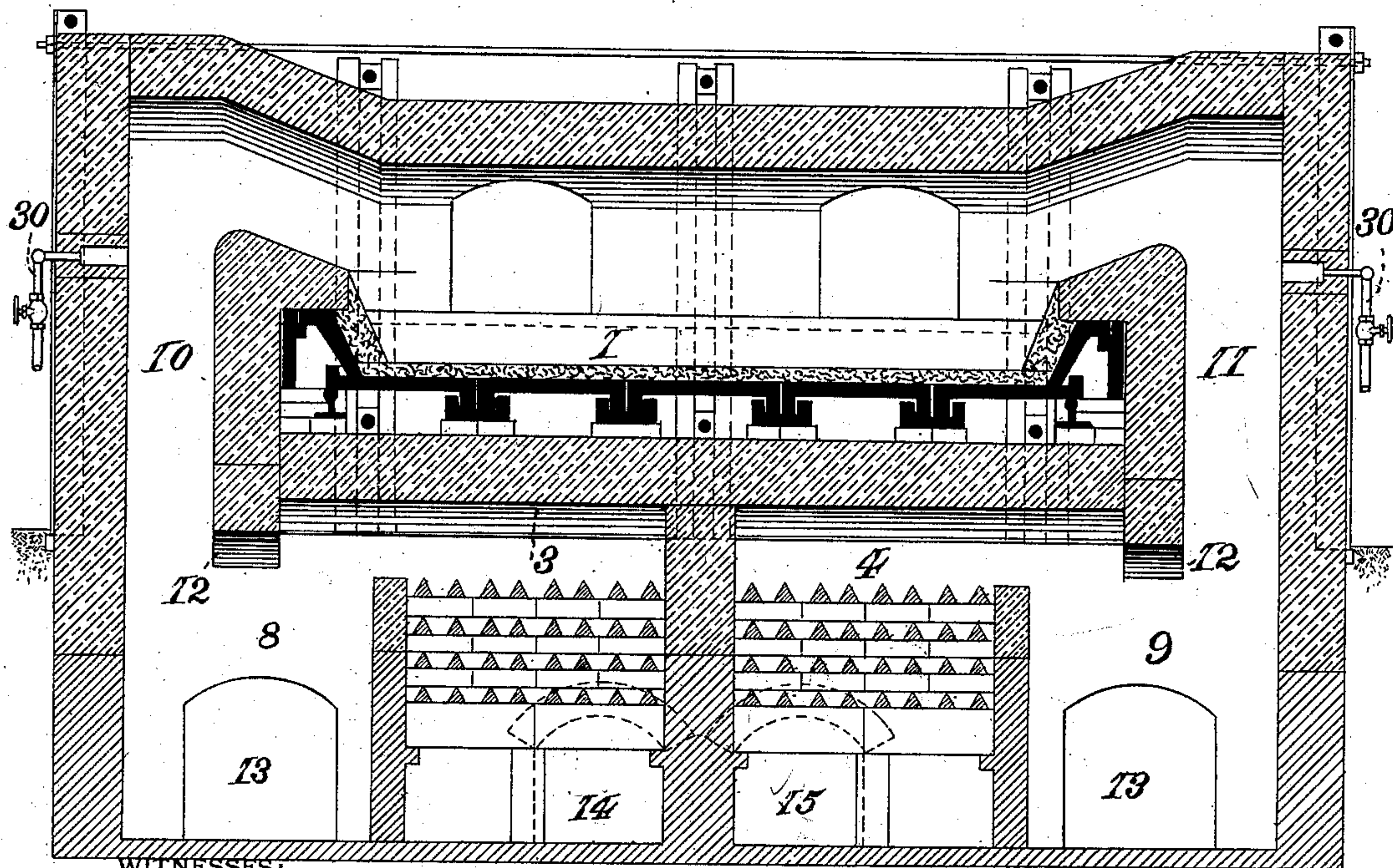


FIG. 3



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(No Model.)

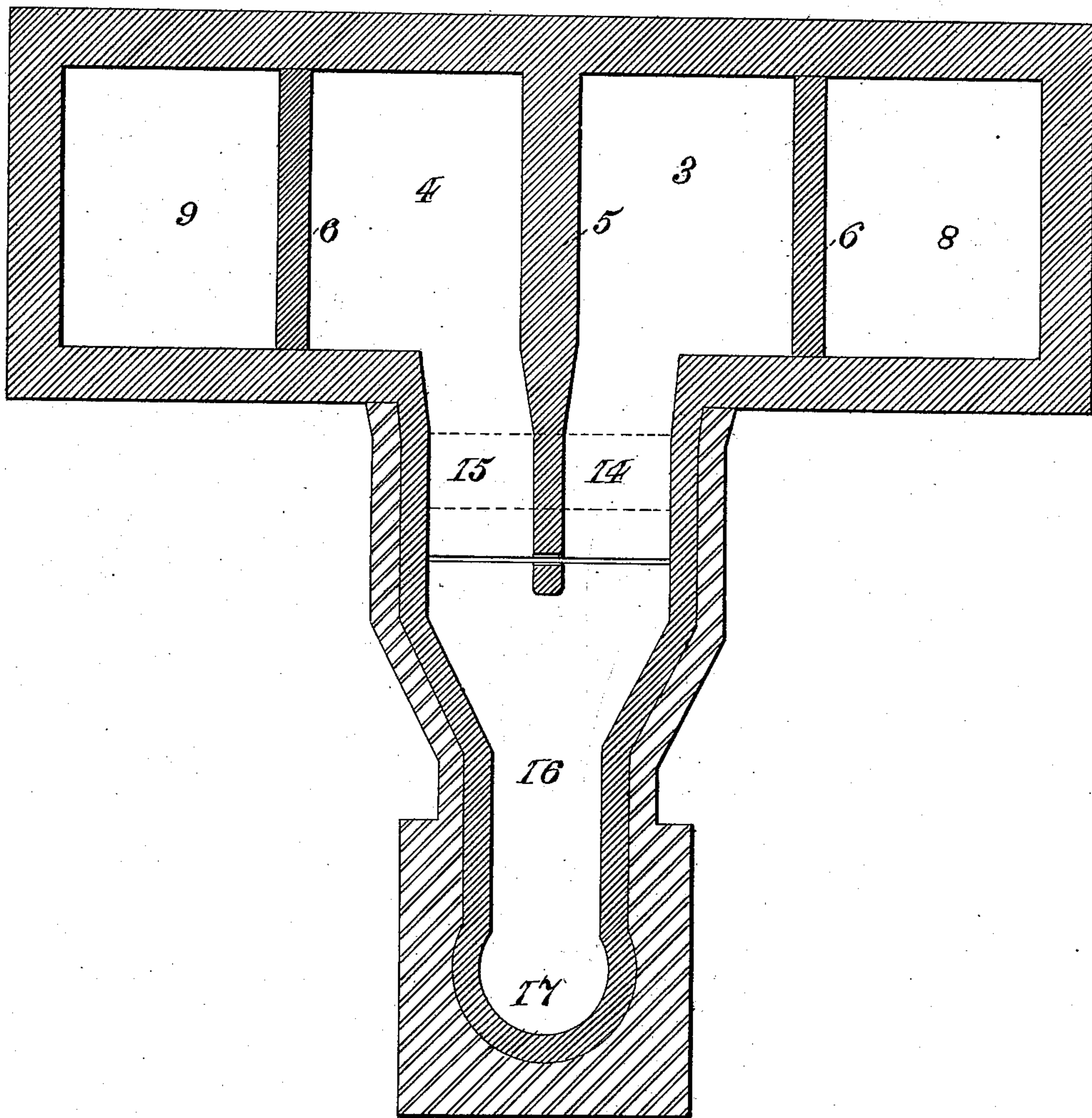
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FIG. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM SWINDELL AND JOHN C. SWINDELL, OF ALLEGHENY,
PENNSYLVANIA.

REGENERATIVE FURNACE.

SPECIFICATION forming part of Letters Patent No. 389,671, dated September 18, 1888.

Application filed August 1, 1887. Serial No. 245,826. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM SWINDELL and JOHN C. SWINDELL, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented or discovered certain new and useful Improvements in Regenerative Furnaces, of which improvements the following is a specification.

10 The invention herein relates to certain improvements in gas furnaces of the open-hearth type, and has for its object such a construction and arrangement of flues and regenerative chambers as will prevent the clogging up of
15 the checker-work of said chambers by dust, slag, and other foreign materials; and it is a further object of the invention to provide for the simultaneous operation of all the valves necessary in a reversal of the furnace by the
20 single movement of one lever.

In general terms, the invention consists in the construction and combination of parts, substantially as hereinafter more fully described and claimed.

25 In the accompanying drawings, forming a part of this specification, Figure 1 is a view, partly in plan and partly in section, of our improved construction of furnace. Fig. 2 is a sectional elevation, the section being taken on
30 the line *xx*, Fig. 1. Fig. 3 is a similar view on the line *yy*, Fig. 1. Fig. 4 is a sectional plan view taken on the line *zz*, Fig. 2. Fig. 5 is a sectional view on the line *tt*, Fig. 1.

The shell of the furnace is of the usual construction as regards the general features thereof. Underneath the hearth 1, which is of the usual construction, are arranged the regenerative chambers 3 and 4, formed by the wall 5, separating the chambers and forming the central support for the arch 7, which in turn supports the hearth and the bridge-walls 6, preferably located at short distances inside of the ends of the hearth, as shown in Fig. 2. The chambers 8 and 9, formed by the bridge-walls
40 6 and the outer walls of the furnace, are connected by the flues 10 and 11, of the usual form and construction, with the melting-chamber. At the ends of the arch 7, forming the top of the chambers 3, 4, 8, and 9, are formed the
50 depending walls 12, which are extensions of

the inner walls of the flues 10 and 11 and project downwardly a sufficient distance to cause the gas or air in its flow from the melting-chamber to the regenerative chambers, or vice versa, to pass down into the chambers 8 and 9, thereby causing such a stoppage or change
55 of flow in the gas or air that dust and other foreign substances will be separated therefrom and deposited in the chambers 8 and 9, from which such deposit can be removed through
60 the doors 13, formed in the outer walls of the furnace for that purpose.

From the regenerative chambers 3 and 4 extend the flues 14 and 15, arranged alongside of each other and uniting a short distance from
65 the furnace with the flue 16, leading to the stack 17. (See Figs. 2 and 4.) In the tops of these flues, near the furnace, are formed openings 18 for the inflow of air, which is regulated by the valve-plate 20, adapted to alternately
70 cover each of the openings 18. This valve-plate is supported on both sides by grooved wheels 21, mounted on small rails 22, arranged alongside of the openings 18. (See Figs. 1
75 and 2.)

The flow of the products of combustion from the regenerative chambers to the stack is regulated by the valve-plate 23, arranged to move transversely of the flues 14 and 15 at a point
80 between the openings 18 in the flues and their junction with the flue 16. A suitable slit is formed through the top of the flues and the wall separating them, so as to permit of the traverse of the valve-plate from one flue to the other. The upper end of the valve-plate
85 projects up through the slit in the top wall of the flues and is supported by the shafts connecting the grooved wheels 24, which are mounted on rails 25 on each side of the slit. The valve-plates 20 and 23 are connected to-
90 gether in such relation to each other by chains or other flexible connections, 26, passing around guide-pulleys 27, that motion imparted to either valve will simultaneously shift the other in the opposite direction, and that when the
95 valve-plate 20 covers the opening into one of the flues, as 14, the valve-plate 23 will close the other flue, as 15, and vice versa. The operating-lever 28, which projects up through the charging-floor 29, can be connected to
100

either of the valve-plates, which, as before stated, are firmly connected together.

It will be readily understood from the above that a reversal of the operation is quickly effected by a single movement of the operating-lever. As the valves are formed of plain cast or wrought iron plates, they can easily be changed and renewed. As the valve 23 in its movements is shifted entirely from one flue to the other, it will be protected from the direct impact of the products of combustion on their way to the stack.

Gas is introduced into the furnace through the pipes 30, projecting through the outer walls of the flues 10 and 11.

Although a plate-valve is for many purposes the preferable form, we do not wish to limit ourselves to such construction, as in many cases other forms are equally applicable.

We claim herein as our invention—

In a regenerative furnace, the combination of flues extending from the regenerative chambers and connected to a stack, each flue being provided with an air-inlet, a valve for closing the inlet of one flue and opening the inlet of the other flue, a second valve for alternately connecting said flues with the stack, and a connection from one valve to the other, whereby the movement of either will simultaneously shift the other in the opposite direction, substantially as set forth.

In testimony whereof we have hereunto set our hands.

WILLIAM SWINDELL.
JOHN C. SWINDELL.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.