

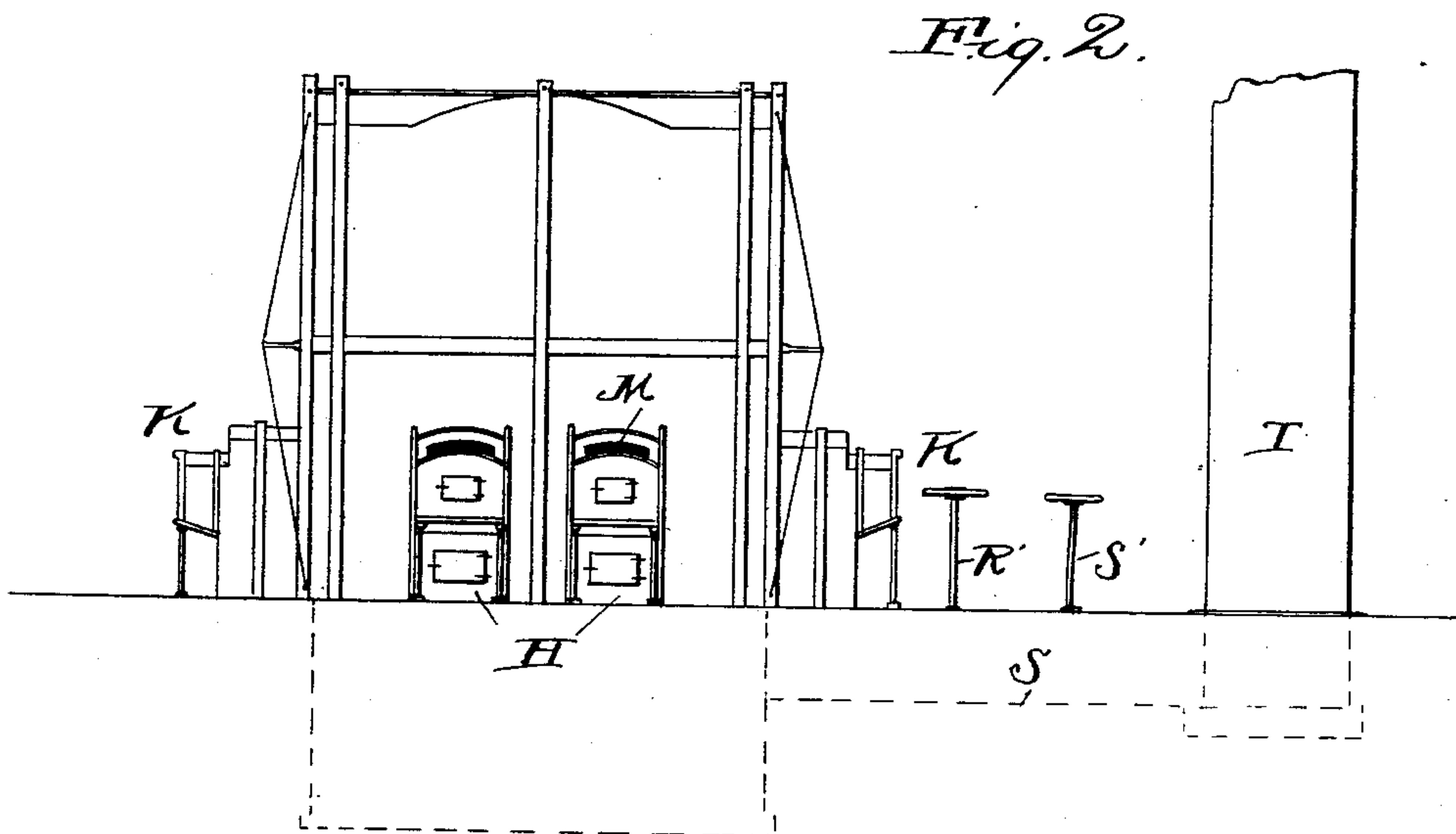
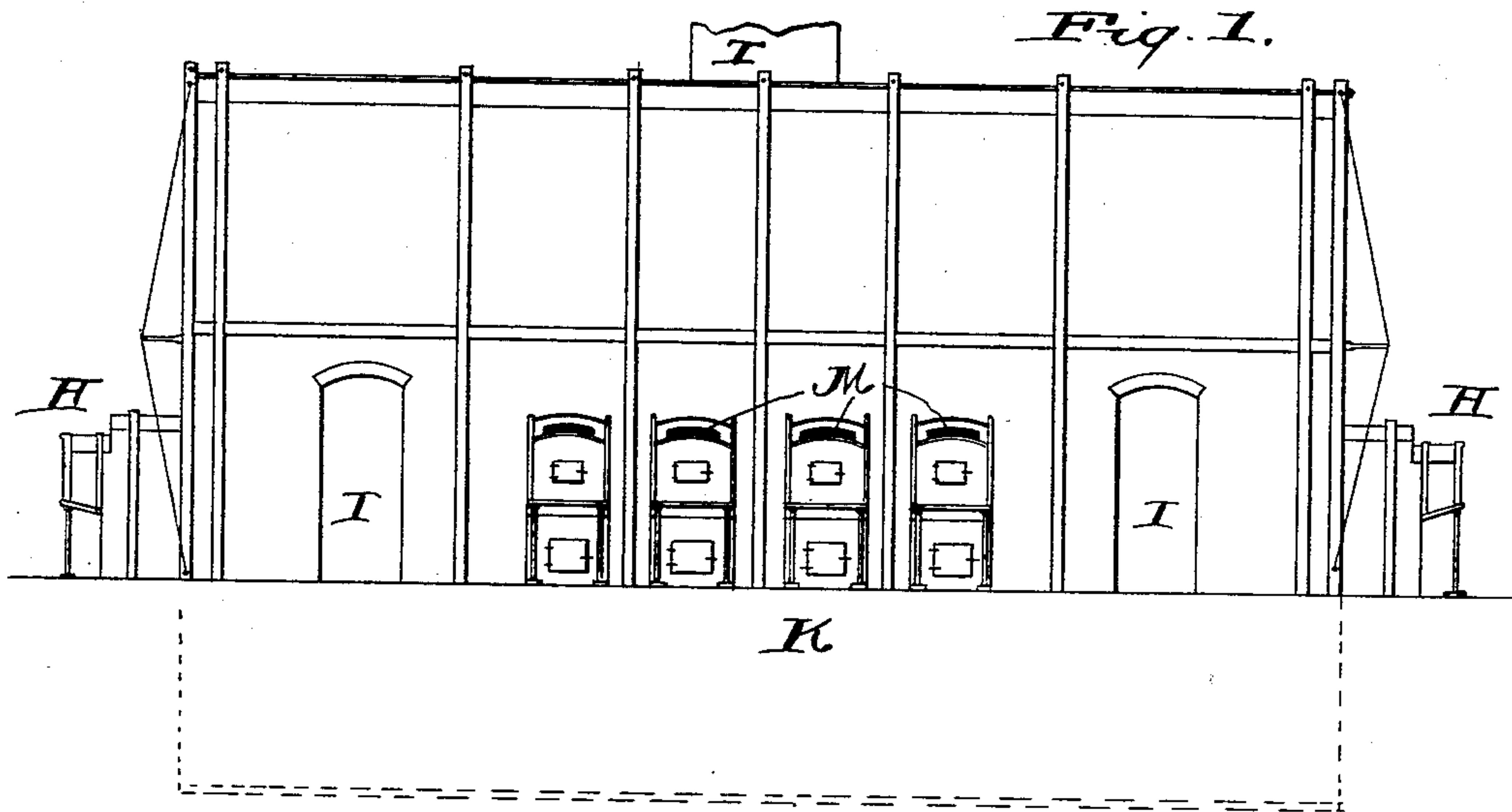
(No Model.)

W. J. THOMAS.  
KILN.

3 Sheets—Sheet 1.

No. 541,218.

Patented June 18, 1895.



Witnesses  
E. B. Gilchrist  
*[Signature]*

Inventor  
William J. Thomas  
By M. D. Leggett & Co.  
his Attorneys

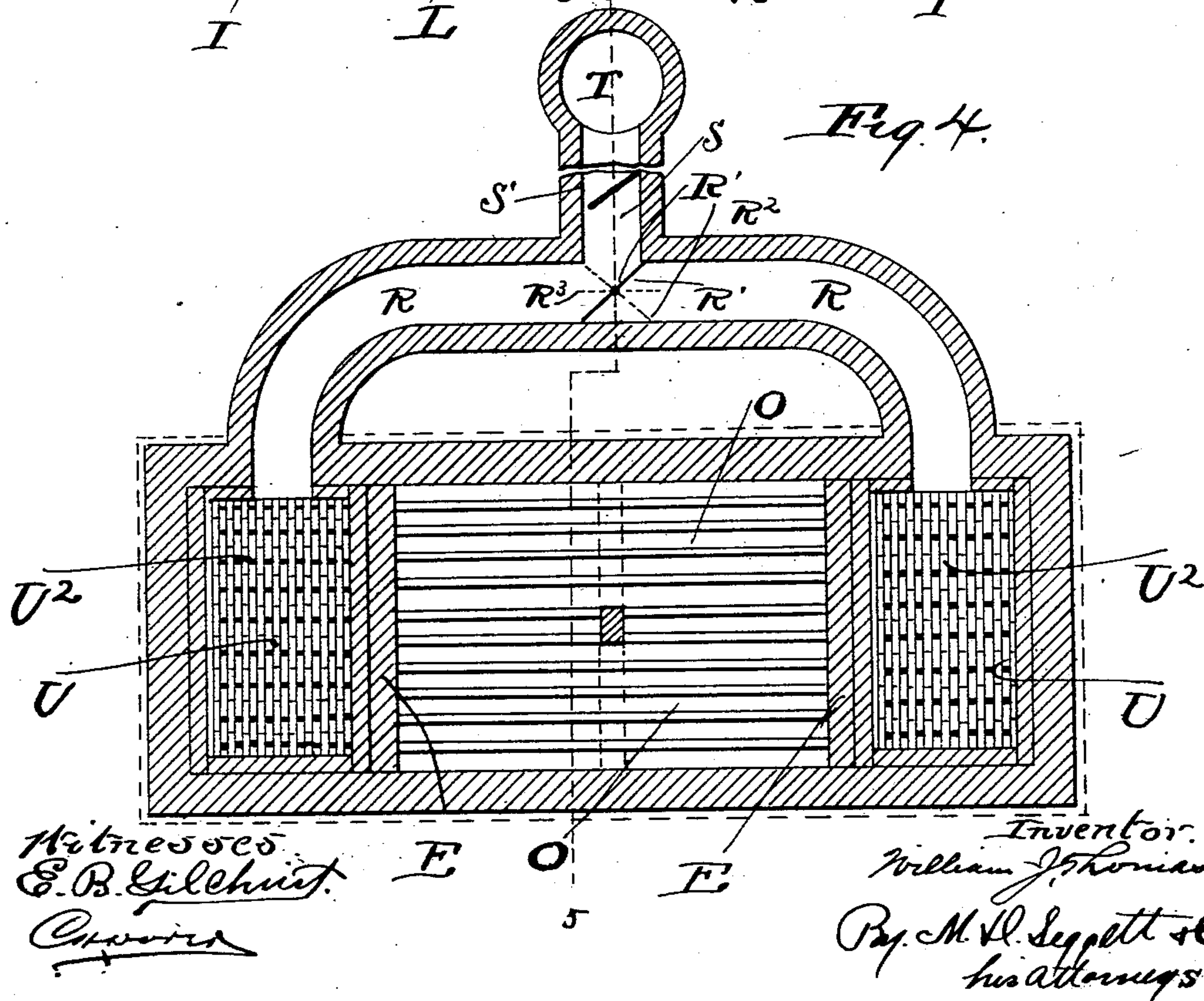
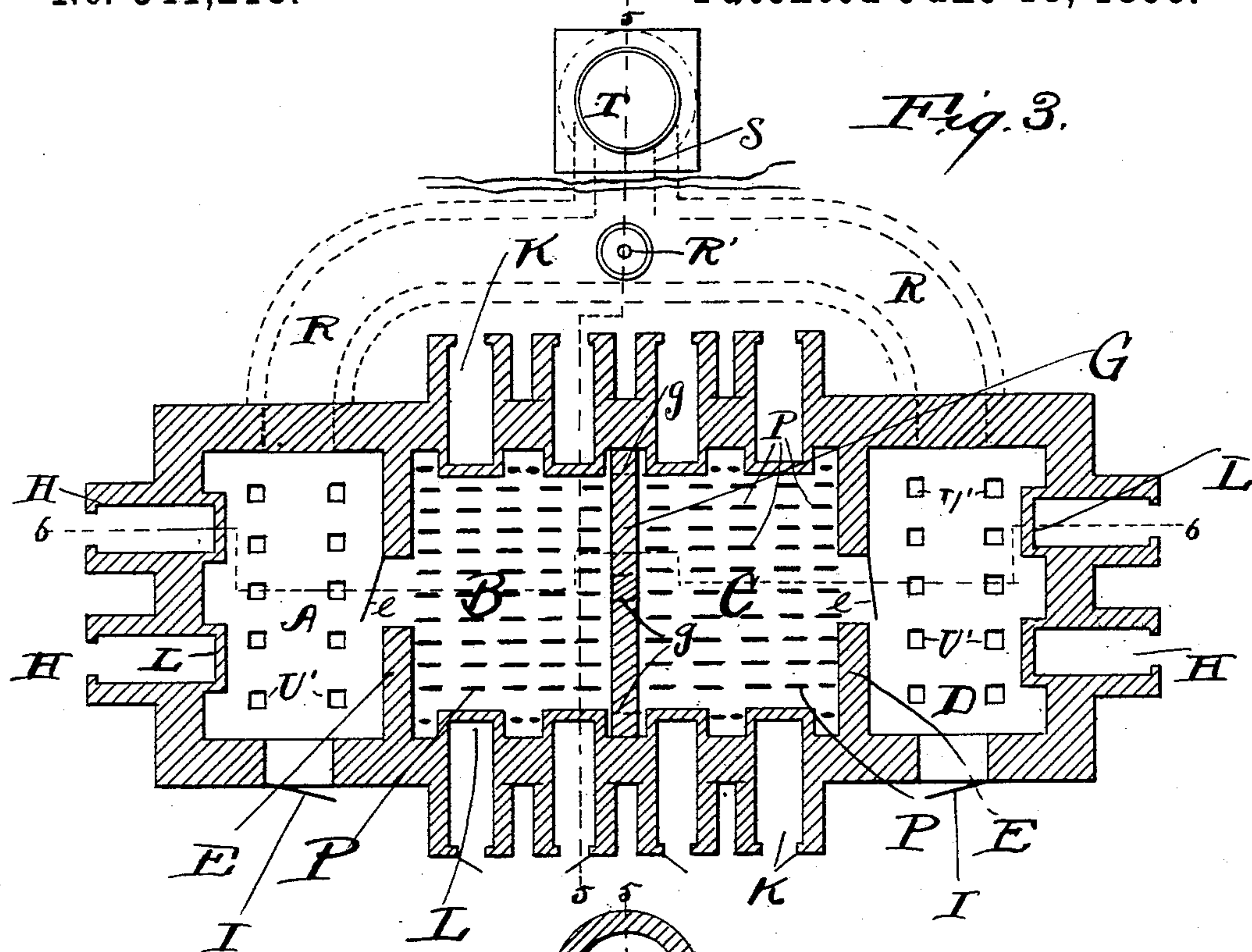
(No Model.)

W. J. THOMAS.  
KILN.

3 Sheets—Sheet 2.

No. 541,218.

Patented June 18, 1895.



Witnesses:  
E. B. Gilchrist  
Charles

Inventor:  
William J. Thomas  
By M. H. Seppelt & Co.  
his Attorneys



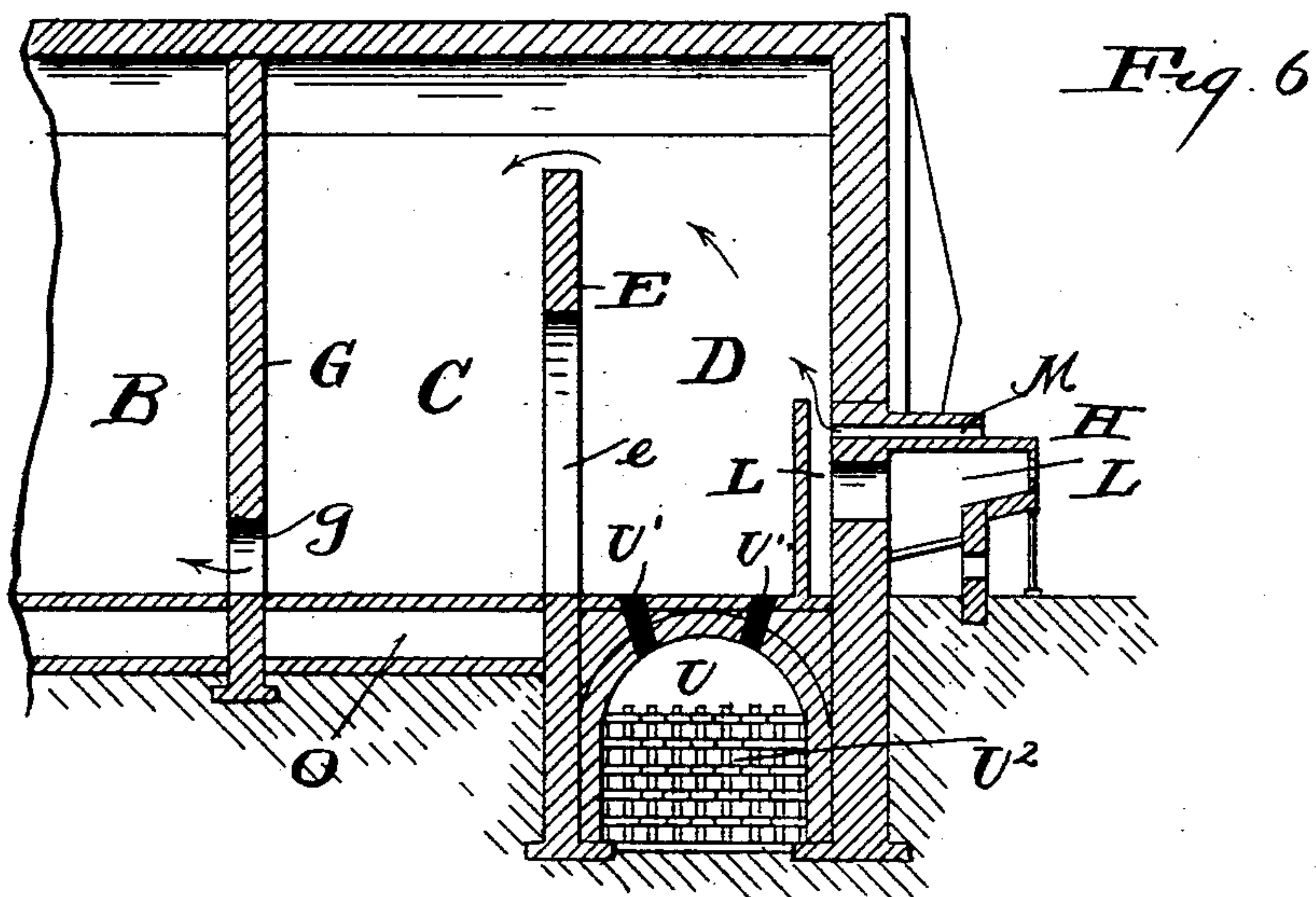
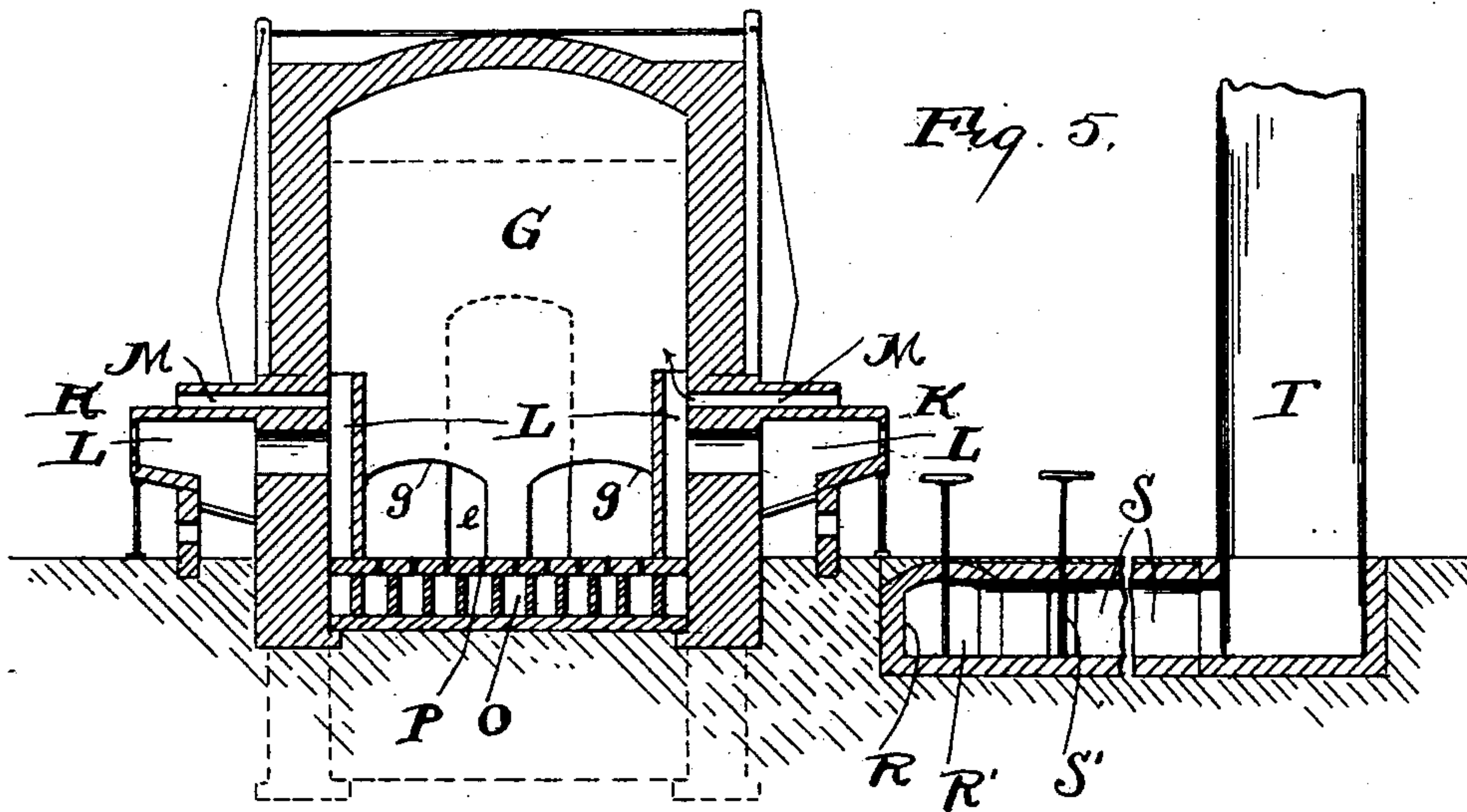
(No Model.)

3 Sheets—Sheet 3.

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Witnesses.  
E. B. Gilchrist  
C. W. ...

Inventor.  
William J. Thomas  
By M. V. Seggett & Co.  
his Attorneys



# UNITED STATES PATENT OFFICE.

WILLIAM J. THOMAS, OF CANAL DOVER, OHIO.

## KILN.

SPECIFICATION forming part of Letters Patent No. 541,218, dated June 18, 1895.

Application filed May 24, 1894. Serial No. 512,337. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. THOMAS, of Canal Dover, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Kilns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in kilns for and method of burning brick, tile and other clay products, the object being to construct a kiln wherein the heating-agent is more economically utilized and is equally distributed throughout the kiln, and so that the products burned in the kiln can be more uniformly treated by reversing the current or draft through the kiln at suitable intervals of time.

With this object in view, and to the end of attaining certain other advantages hereinafter specified, my improved kiln consists in certain features of construction and in combinations of parts hereinafter described and pointed out in the claim.

A preferable construction of kiln embodying my invention is shown in the accompanying drawings, wherein—

Figures 1 and 2 are elevations of adjacent sides, respectively, of the kiln. Figs. 3 and 4 are top plans in horizontal section, taken above and below the floor line respectively. Fig. 5 is a vertical section on line 5 5, Figs. 3 and 4; and Fig. 6 is a vertical section on line 6 6, Fig. 3.

The kiln illustrated is of the quadrangular variety and has four rooms or chambers A, B, C and D, located in line as shown. Chambers B and C constitute the central or inner chambers and chambers A and D constitute the end or outer chambers. Every one of said chambers is designed to receive products to be burned. The partition or dividing-walls E between the end or outer chambers and the central or inner chambers are provided with doors *e* through which access is had into the central or inner chambers. Said dividing-walls or partitions do not extend to the top of the kiln, but terminate, at their upper end, a suitable distance below the top of the kiln, in order to form open communication between the outer or end-chambers and the central or

inner chambers of the kiln. The dividing-wall or partition G between the two central or inner chambers, at or near the bottom, is provided with one or more lateral ducts *g* establishing open relation between said chambers. Those side-walls of the outer or end-chambers, that are located opposite to the partitions between said chambers and the central or inner chambers, are provided with one or more furnaces H, and one of the side-walls of said outer or end-chambers that is adjacent to the furnace-bearing wall, is provided with a door I for access to the respective chamber. The central or inner chambers, at the side-walls adjacent to the dividing-wall or partition between said chambers are provided, respectively, with one or more furnaces K. The fire or fuel-chamber of each furnace of the kiln is in open relation with an upright flue L constructed at the rear of the furnace and discharging upwardly into the adjacent chamber of the kiln.

A horizontally-arranged flue or passage-way M is shown constructed above each furnace of the kiln, said flue discharging into the upright flue L at the rear of the furnace, and being adapted to conduct air from outside of the kiln to said upright flue, where the air commingles with the products of combustion leading from the furnace, and thereby improves the combustion.

A series of horizontally-arranged flues O are suitably constructed below the floor of the central or inner chambers of the kiln, said flues being arranged preferably side by side, and parallel with each other, and at right angles to the dividing-wall or partition G between said chambers. Holes or perforations P in the floors of said central or inner chambers establish open relation between said horizontally-arranged flues and the interior of said chambers. Said flues O are designed to distribute heat in under the floor of the kiln and heat said floor from below.

By the construction thus described, it will be observed that the heating-agent is generated at all sides of the kiln. The heating-agent from the furnaces of the outer or end-chambers passes upwardly into said chambers over the dividing-walls or partitions between said chambers and the central or inner chambers and thence downwardly to and



through the lateral ducts in the dividing or partition wall G between the two central or inner chambers, and, in their passage into and through the inner or central chambers, unite with the products of combustion from the furnaces of said inner chambers, resulting in a still higher or more complete combustion. A flue or passage-way, R, located below the ground or floor-line, connects the outer or end-chambers of the kiln, and a duct or passage-way S, also located below the ground or floor-line, connects said flue R with the stack or chimney T of the kiln. Flue or passage-way R, at the mouth or induction-end of duct S is shown provided with a rotary valve or damper R' adapted to interrupt the continuity of said flue and adapted to establish communication between duct S and either end of flue or passage way R, and the draft through the kiln is in the one direction or the other according as duct S, and consequently the stack or chimney, is placed in open relation with the one or the other of the outer or end-chambers of the kiln. It will, therefore, be observed that the draft through the kiln, can, by means of said valve or damper, be reversed at pleasure, whereby the interior of the kin can be maintained in a most uniformly heated condition, and the result is a most evenly heated and shaded product.

In Fig. 4 of the drawings valve or damper R', in solid lines, is shown in the position required to establish communication between duct S and end-chamber A and to close open relation between said duct and end-chamber D, whereas, by dotted lines R<sup>2</sup> in same figure, it is shown in position opening communication between end-chamber D and duct S and closing communication between said duct and end-chamber A.

Duct S that leads to the stack or chimney, as hereinbefore indicated, is preferably provided with a valve or damper S' whereby the passage of the heating-agent or products of combustion to the chimney can be interrupted when desired, and valve or damper R' can be placed in the position shown by dotted lines R<sup>3</sup> in Fig. 3 so as not to interrupt the continuity of the passage-way R. I would also remark that chambers or pits U are constructed below a floor of the outer or end-chambers of the kiln, said lower chambers or pits being in open relation with the adjacent outer or end-chamber of the kiln by means of any suitable number of ducts U' leading from the lower chamber or pit into the kiln-chamber above. Chambers or pits U are provided for the purpose of storing heat, as will presently

be described, and, in order to enlarge their storing capacity, are preferably occupied, to any desired extent, with checker-work of brick or other heat-absorbing material.

In the operation of the kiln, with the draft through the kiln in a given direction, some of the heating-agent passes into and is stored in the pit located below the kiln-chamber that (at the one end of the kiln) is in open relation with the stack or chimney and when the draft is reversed, the heat, thus stored away below the respective kiln-chamber, is drawn back into and through the kiln with the reverse-draft, and heat, in turn, is stored in the pit under end-chamber at the opposite end of the kiln, all whereof is instrumental in utilizing the heat to the best advantage and in obtaining the best and most uniform results.

I would here remark that my invention not only involves the improved construction of kiln hereinbefore described, but also embraces the method of burning products in the kiln by reversing the direction of the draft through the kiln, at suitable intervals of time, during the burning operation, and I would further remark that the draft is preferably reversed about once every hour during the operation.

What I claim is—

A kiln divided into four rooms or chambers A, B, C and D arranged in line, substantially as shown, the central or inner chambers being in open relation with each other at the bottom and the outer or end-chambers being in open relation, respectively, with the next adjacent central or inner chamber at the top; doors leading from outside of the kiln into the outer or end-chambers; doors leading from the outer or end-chambers to the central or inner chambers; one or more furnaces for discharging heat into the outer or end-chambers, said furnaces being located at the sides of said chambers that are opposite to the partition or dividing-walls between said chambers and the central or inner chambers; furnaces at opposite sides of the central or inner chambers; stack or chimney; passage-ways connecting the outer end-chambers with said stack or chimney, and suitable means whereby the draft through the kiln can be reversed at pleasure, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 13th day of April, 1894.

WILLIAM J. THOMAS.

Witnesses:

C. H. DORER,  
WARD HOOVER.