3 Sheets—Sheet 1.

R. CARROLL.

BRICK-KILN.

No. 185,668. Patented Dec. 26, 1876.

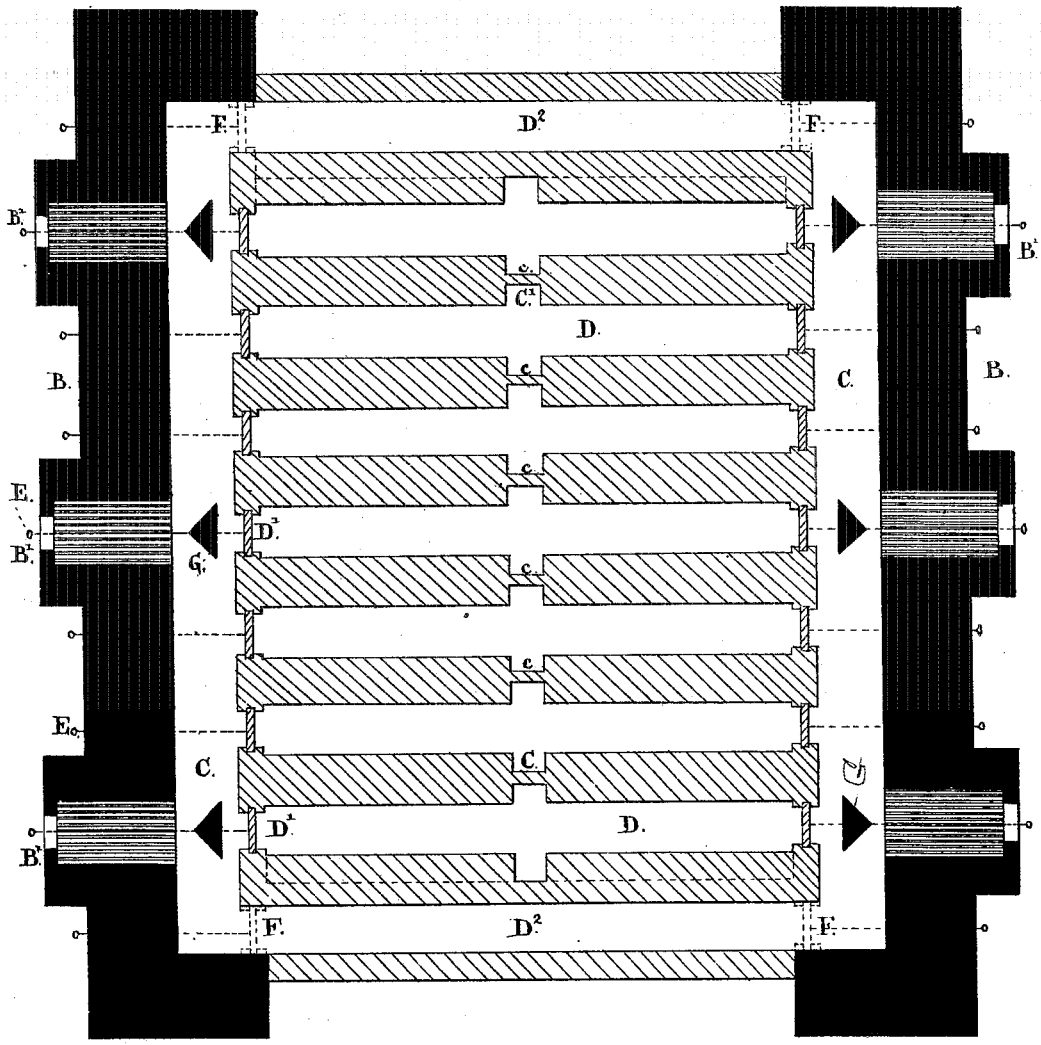

Fig. 1.

WITNESSES.

H. H. Warren

H. E. C. Carryl

INVENTOR

Robert Carroll

by Ridout & Lird & Co.

Attys.

3 Sheets—Sheet 2.

R. CARROLL.

BRICK-KILN.

No. 185,668. Patented Dec. 26, 1876.

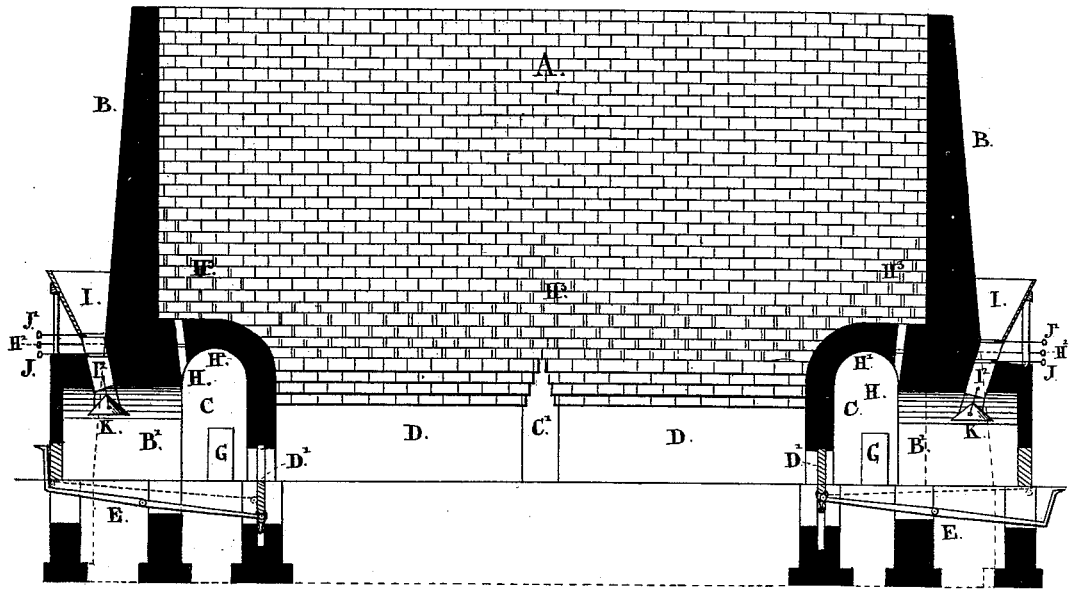

Fig. 2.

Fig. 5.

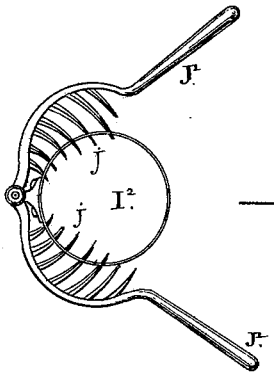

Fig. 6.

WITNESSES

Harry H. Warren

H. Carrp

INVENTOR

Robert Carroll

by Ridout & Maybee

Attys.

3 Sheets—Sheet 3.

R. CARROLL.

BRICK-KILN.

No. 185,668. Patented Dec. 26, 1876.

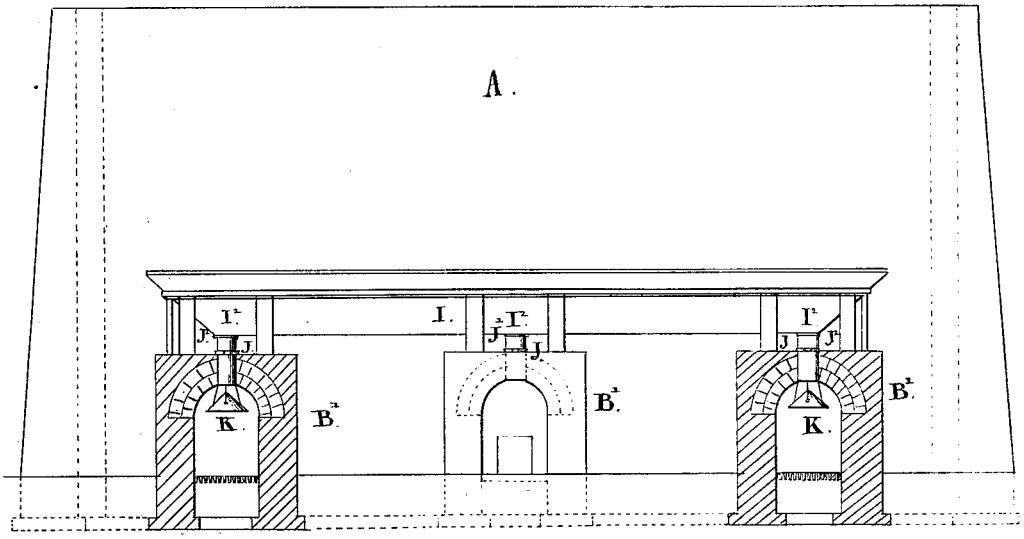

Fig. 4.

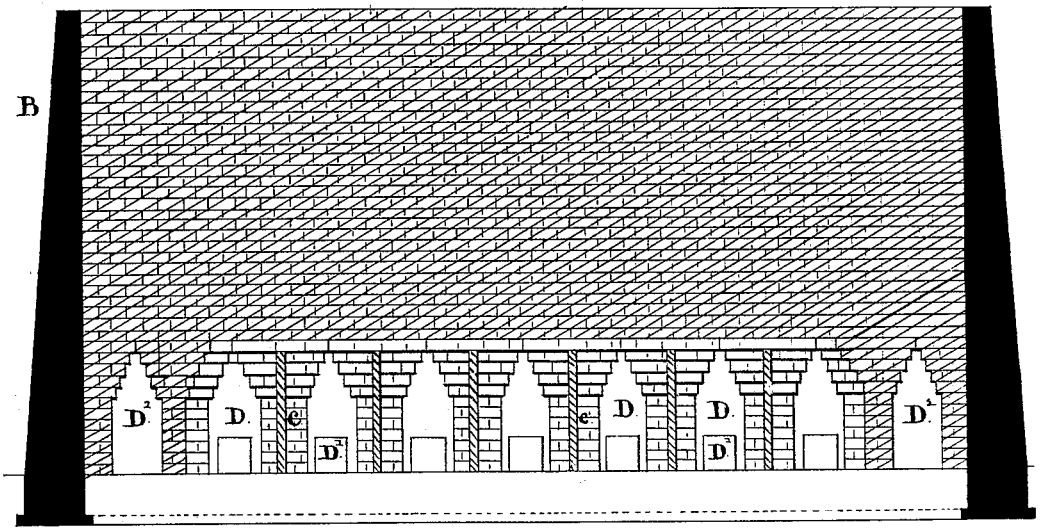

Fig. 3.

WITNESSES

H. H. Warren

H. E. C. Carryl

INVENTOR

Robert Carroll

by Ridout & Maybee

Attys.

UNITED STATES PATENT OFFICE.

ROBERT CARROLL, OF TORONTO, ONTARIO, CANADA.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. **185,668**, dated December 26, 1876; application filed May 13, 1876.

To all whom it may concern:

Be it known that I, ROBERT CARROLL, of the city of Toronto, in the county of York and Province of Ontario, Canada, manufacturer, have invented certain new and useful Improvements in Brick-Kilns; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, and the letters of reference marked thereon, and forming a part of this specification.

My invention relates to the manner of setting the arches in the kiln and the arrangement of dampers in controlling and directing the heat, and to the apparatus for feeding the fuel to the furnaces; and it consists, first, in building the kiln with three transverse arches, one being placed in the center, and one at each side of the kiln at right angles with the ordinary arches. The side transverse arches run the full length of the kiln, connecting with and entering into the ordinary end arches, thus forming a continuous passage all around the body of the brick for the passage of the heat. The side transverse arches also connect at will with the ordinary arches by means of openings provided with dampers, which dampers are operated from outside of kiln-case. The center arch is formed commencing at the center of the inside bench of outside end arch, and extends through the heart of kiln, terminating at a corresponding point at the other end. This arch is divided into sections by draft-walls running from end to end of each bench. By this mode of construction, and by means of the center transverse arch or fire chambers, together with the side transverse arches, we are able to burn a much wider kiln than has hitherto been attempted, thus saving largely, both in fuel and labor, on the bricks burned, and at the same time greatly increasing the quantity of the choicest bricks in each kiln.

My invention consists, secondly, of a hopper-bottomed coal-reservoir, into which the coal is shoveled from the wagons, placed above the top of the furnaces, and provided with downwardly-projecting chutes or leading-pipes, which pipes extend into the furnace-chamber, and are fitted with a pair of dampers for the purpose of measuring and discharging the fuel in charges of regular quantity into the furnace. The discharge end of the feed-pipes are fitted with "roses," for the purpose of distributing the fuel equally over the bed of the furnace. By this process one burner can do the work of three, nor is he brought into contact with the fire.

In the accompanying drawings, Figure I is a plan, Figs. II and III sections, and Fig. IV a side view, of a kiln constructed according to my invention. Figs. V and VI are details of the cut-off damper.

A is the kiln, having the permanent side walls B, and furnaces B′, the permanent portion of the construction being indicated by solid black within the boundary-lines, and the temporary construction by open lines. C C are the side transverse arches, into which the furnaces B′ enter, and C^2 is the central transverse arch connected to the side arches by the ordinary arches D. The connection between the arches C and D is optional, a cut-off damper, D^1, of fire-brick, being provided at each end of the latter, which dampers are operated from the exterior of the kiln-case by the pivoted lever E, or any equivalent mechanical device. The side arches connect at each end at right angles with the ordinary end arches D^2 of the kiln, thus forming a continuous passage for the heat around the whole body of the bricks; but in order that the heat may be cut off from, or concentrated at, any side, movable fire-brick dampers F are fitted at each angle and operated from outside of the kiln. The center arch C^1 is divided into sections by the draft-walls *c*, running from end to end of each bench. G are triangularly-shaped shield-blocks, placed in the arches C C, immediately in front of the mouth of the furnace, with the object of dividing and deflecting the heat, and to prevent too direct a connection with the arch immediately in front of the furnace. At intervals in the length of the side arches C C a flue, E, fitted with a cut-off damper, H^1, operated by a rod, H^2, from inside of the case, is led from the crown of the arch upwardly and outwardly. Above this flue the bricks are built "scintling" for a few courses, H^3, in order that the fire may move freely through to outside bricks.

As will be observed, the scintling or separating a short distance apart of the bricks at

the central and side portions of the kiln are made to extend much higher than the rest, and in some instances are carried to the top of the kiln, so as to form flues for the heat to pass freely through all portions of the mass of bricks. These flues may, if desired, be led direct from each furnace, as shown by dotted lines.

I are the fuel-reservoirs, built strongly of wood, and hopper-bottomed, in order that the fuel may feed itself to the furnace leading-pipes I^2. These pipes (of, preferably, a circular form) are fitted with two dampers, placed with an interval between sufficient to contain a charge, the lower damper, J, being an ordinary close draw-valve, but the upper damper, J′, being formed of two pieces hinged together at one end, and fingers *j*, which, in the operation of closing, pass readily between the lumps of coal, cutting off the supply. K is a rose, attached to the discharge end of the pipes I^2, for the purpose of spreading the coals equally over the fire-bars.

In operation, the heat is first cut off from the body of the kiln and confined to the arches C C, from whence it passes into the end arches D^2, and at the same time upwardly through the flues H to the scintled courses, thus thoroughly and rapidly heating the entire outside of the kiln. When this portion has been thus treated, the dampers H^1 are closed and the dampers D^1 opened. The heat then passes into and concentrates in the ordinary arch D and center arch C^1, each section of which forms a reservoir, thus thoroughly burning the center of the kiln, which, being much wider than any hitherto in use, gives us a much larger quantity of choice bricks in each kiln without additional furnaces or labor.

I claim as my invention—

1. In a brick-kiln constructed with front and rear system of furnaces B B′, opening directly into a passage, C D^2, which extends entirely around the body of the kiln, the dampers F, placed at the angles of the passages C D^2, and dampers D^1 placed at the entrances to the arches D, whereby the heat may be cut off or concentrated at any point, as and for the purposes set forth and shown.

2. The center arch C^1, divided into independent sections by the draft-walls *c*, and connected to the side arches C C by the ordinary arches D, the entrances to the said arches D being fitted with cut-off dampers D^1, operated by the pivoted lever E, or any equivalent mechanical device from the exterior of the kiln-case, arranged and operating as and for the purpose specified.

3. In combination with the arches C and furnaces B′, the flues H, provided with dampers H^1, operated from the exterior of the kiln by rods H^2, substantially as and for the purposes described.

4. The hopper-bottomed fuel-reservoirs I, placed over the furnaces, and provided with the leading-pipes I^2, the said pipes being fitted with the cut-off damper J′, draw-valve J, and rose K, arranged and operating substantially as described, and for the purpose specified.

5. In a brick-kiln, in combination with the flues H and C^1, the flues H^3, formed over the central and side arches by scintling or separating the bricks, as shown, and made to extend up to, or near, the top of the kiln, substantially as and for the purposes described.

Toronto, March 16, A. D. 1876.

ROBERT CARROLL.

In presence of—

GEO. A. AIRD,

H. WARREN.