Feb. 14, 1933. W. B. MITCHELL 1,897,270

CHECKER BRICKWORK CONSTRUCTION FOR REGENERATOR FURNACES

Filed June 16, 1932 3 Sheets-Sheet 1

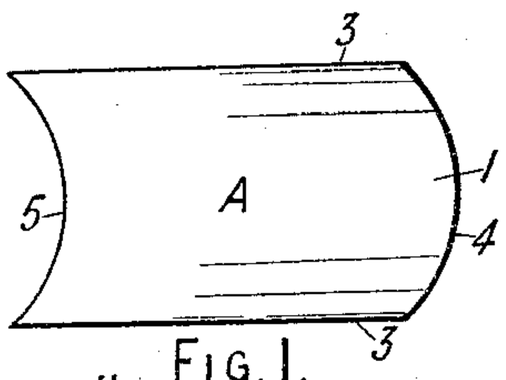

FIG. 1.

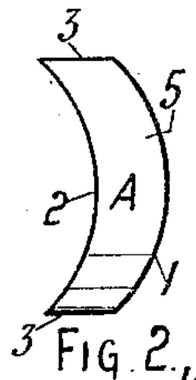

FIG. 2.

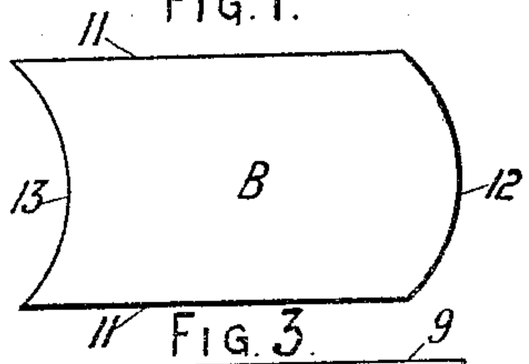

FIG. 3.

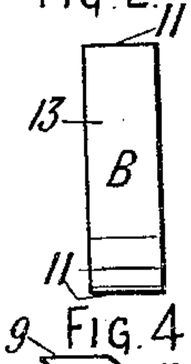

FIG. 4.

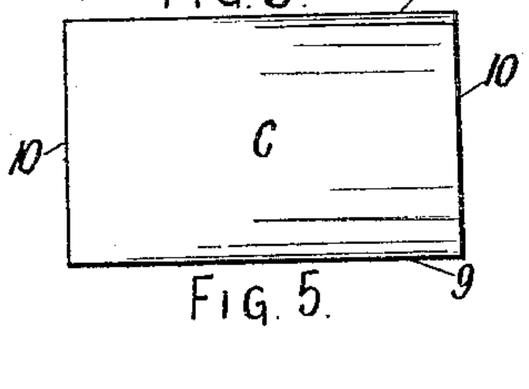

FIG. 5.

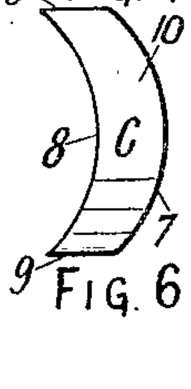

FIG. 6

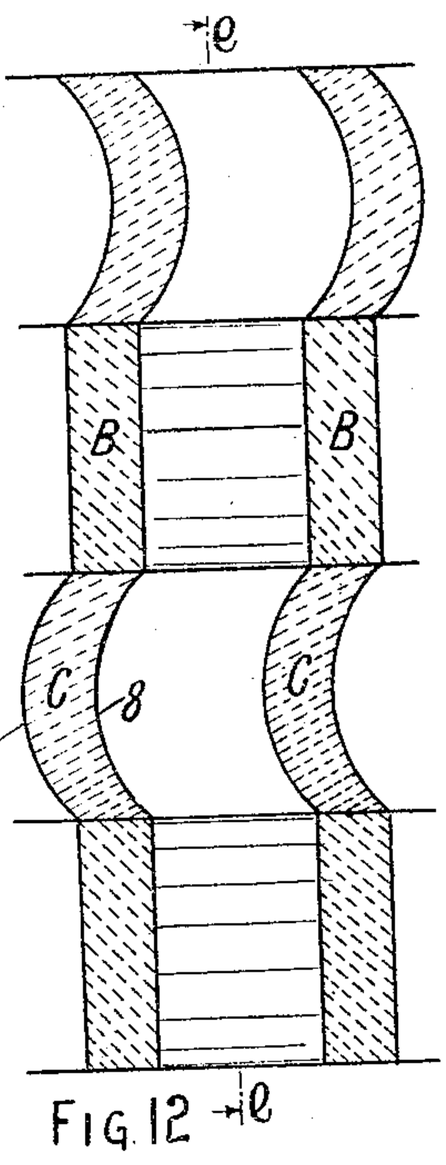

FIG. 12

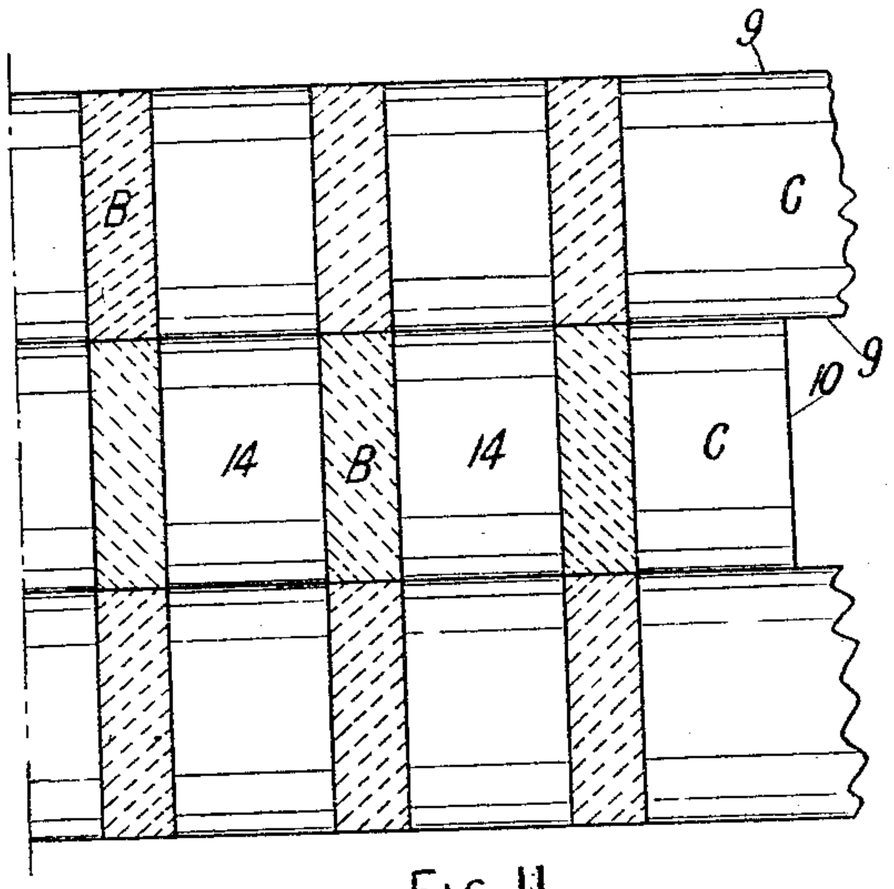

FIG. 11.

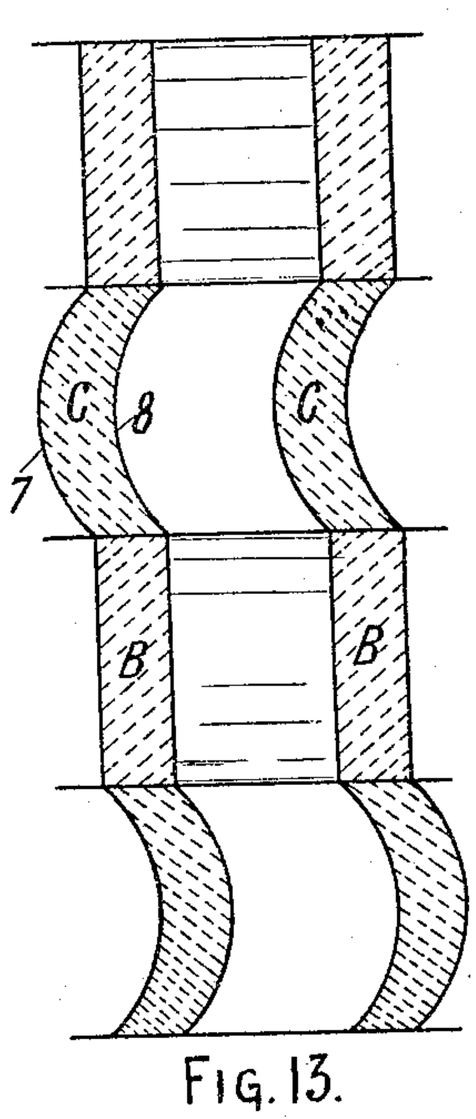

FIG. 13.

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CHECKER BRICKWORK CONSTRUCTION FOR REGENERATOR FURNACES

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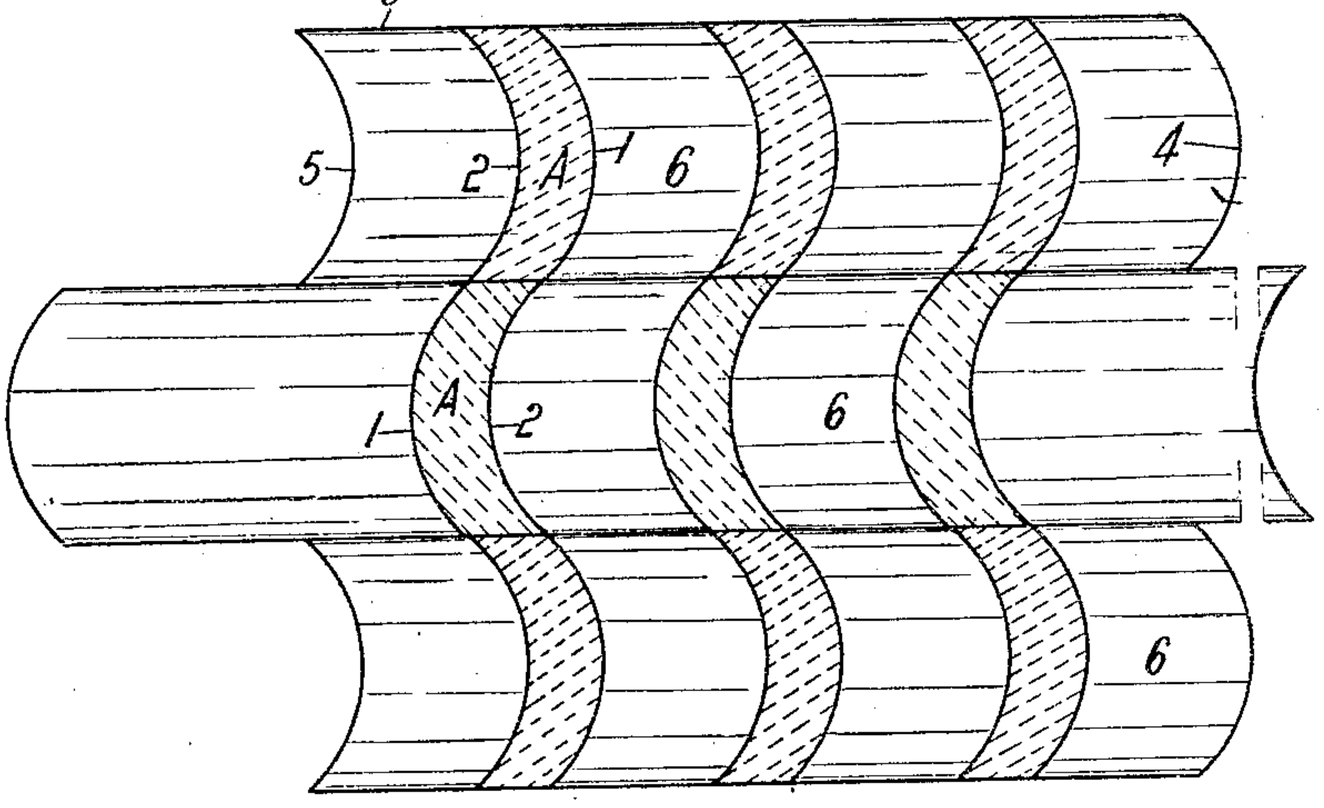

FIG. 8

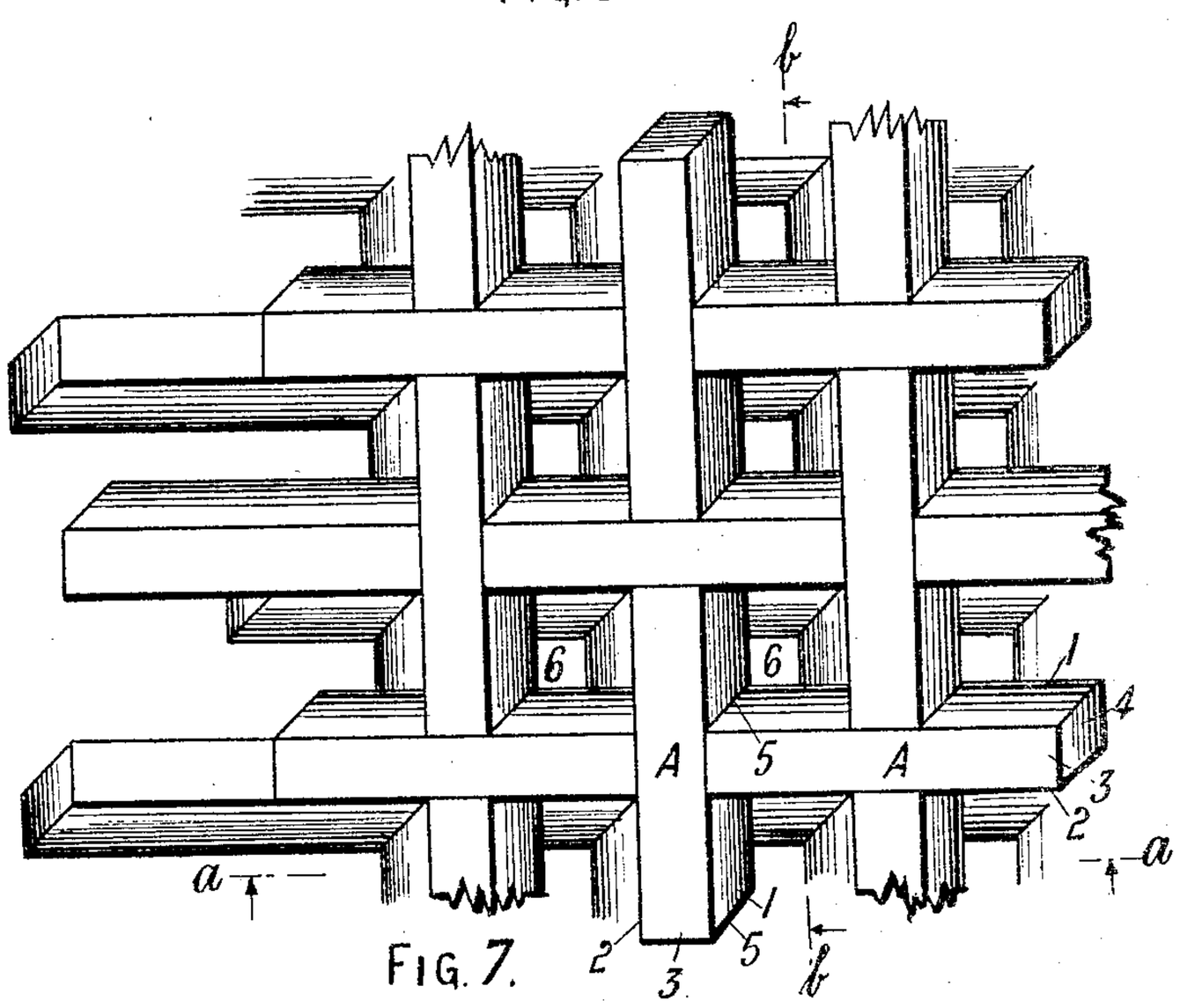

FIG. 7.

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CHECKER BRICKWORK CONSTRUCTION FOR REGENERATOR FURNACES

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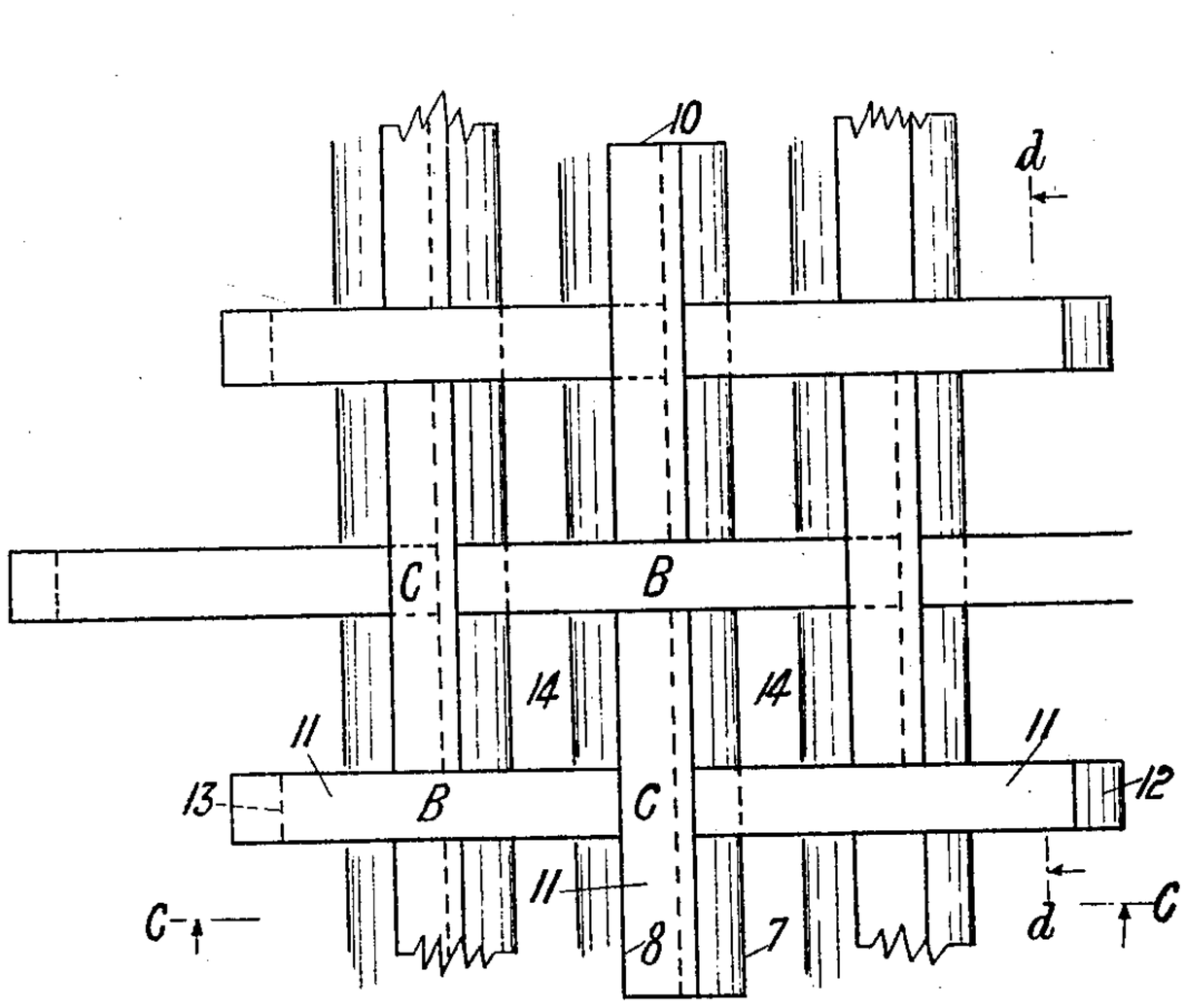

FIG. 9.

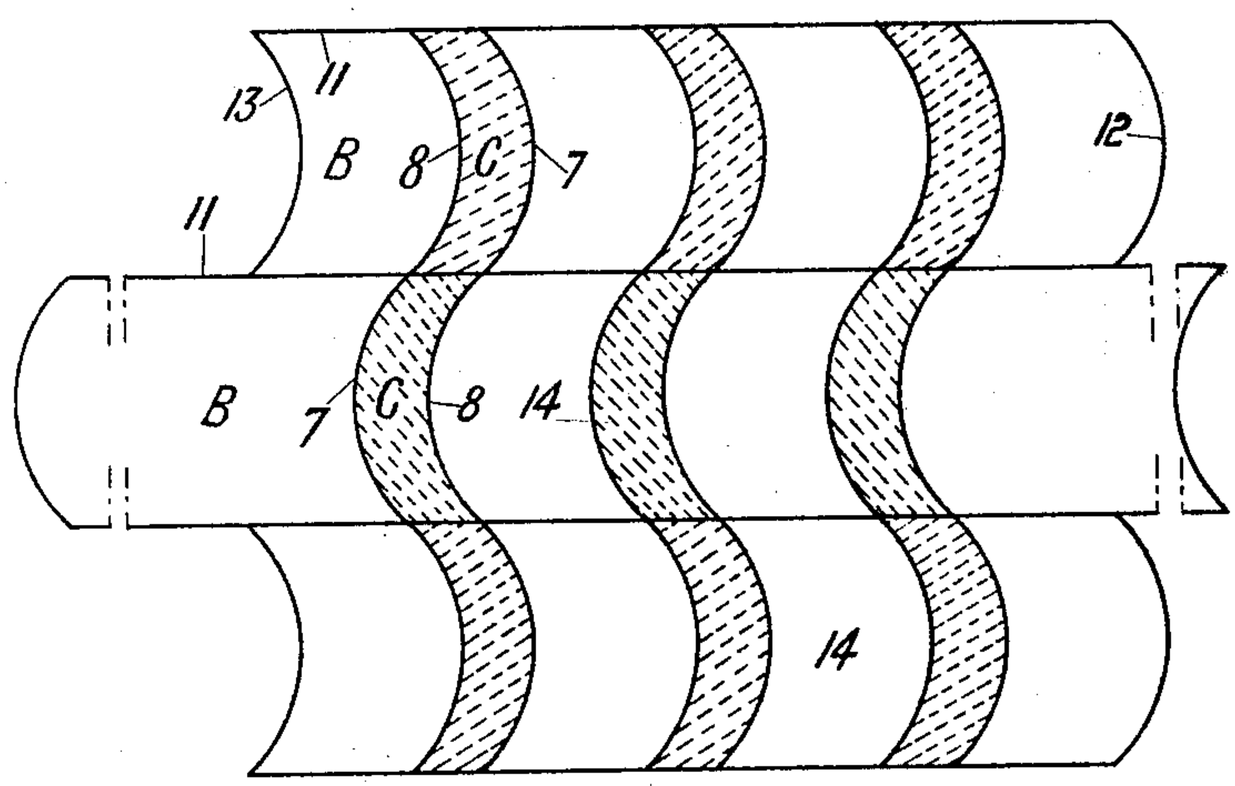

FIG. 10.

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1,897,270

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CHECKER BRICKWORK CONSTRUCTION FOR REGENERATOR FURNACES

Application filed June 16, 1932, Serial No. 617,516, and in Great Britain February 16, 1932.

This invention relates to improvements in checker brickwork constructions for regenerator furnaces.

According to the invention the checker brickwork presents a plurality of gas passages bounded by sinuous walls and each of substantially the same cross sectional area throughout and uninterrupted by projections, ensuring effective turbulence of the gases and, by continuous deflection of the gas stream, effecting rapid heat exchange.

As hereinafter described the filler bricks constituting the checker work are of generally rectangular form but have two opposed convexly and concavely curved faces.

In the accompanying drawings Figs. 1 and 2, 3 and 4, and 5 and 6, are elevations at right angles to each other showing three forms of brick designated hereinafter for convenience of description as bricks A, B and C, respectively; Figs. 7 and 8 shows a portion of a checker-work structure composed of bricks A and presenting a plurality of gas passages each of which is bounded by four sinuous walls, Fig. 7 being a plan view and Fig. 8 a section on the line *a*—*a* or on the line *b*—*b* of Fig. 7; Figs. 9, 10 and 11 show a portion of a checker-work structure composed of bricks B and C presenting a plurality of gas passages each of which is bounded by two opposed sinuous walls and by two opposed plane walls at right angles to the sinuous walls, Fig. 9 being a plan view, Fig. 10 a section on the line *c*—*c* of Fig. 9, and Fig. 11 a section on the line *d*—*d* of Fig. 9; Figs. 12 and 13 show a portion of a checker-work structure comprising a combination of bricks B and C so assembled that the bricks B and C of any one course are disposed, respectively, at right angles to the bricks B and C of the next underlying course, Fig. 12 being a vertical section and Fig. 13 a vertical section on the line *e*—*e* of Fig. 12.

The structure shown in Figs. 7 and 8 is composed of filler bricks A (Figs. 1 and 2) each formed as a segment having convex and concave cylindrical lateral faces 1, 2, respectively, of the same radius of curvature and having plane top and bottom sides 3 parallel to the axes of said cylindrical surfaces, and convex and concave ends 4, 5, respectively, of the same radius of curvature, equal to the radius of curvature of the lateral faces 1, 2, the bricks being so assembled that the resultant checker-work structure presents a plurality of gas passages 6 each of which is bounded by four sinuous walls.

The bricks A are mated T fashion to form superposed grid-like courses, the bricks constituting each course facing reversely to the bricks of the next underlying course.

The structure shown in Figs. 9–11 is composed of bricks B and C (Figs. 3–6), each brick C being formed as a segment having convex and concave cylindrical lateral faces 7, 8, respectively, of the same radius of curvature, parallel top and bottom sides 9, and parallel ends 10 at right angles to the sides 9, and each brick B being formed as a flat slab having parallel top and bottom sides 11 and convexly and concavely curved ends 12, 13, respectively, of the same radius of curvature, equal to the radius of curvature of the cylindrical faces 7, 8 of the bricks C.

The structure constituted by assembling such bricks presents a plurality of gas passages 14 each of which is bounded by two opposed sinuous walls and two opposed plane walls transverse to the sinuous walls.

Alternatively, and as shown in Figs. 12 and 13, the bricks may be so assembled that the bricks B and C of any course are respectively disposed transversely to the bricks B and C of the next underlying course.

The bricks B and C are mated T fashion to form superposed grid-like courses, the bricks B running at right angles to the bricks C and in each course the C bricks curve reversely to the C bricks on the underlying course.

I claim:—

1. A checker brickwork construction for regenerator furnaces comprising superposed courses each constituted by filler bricks arranged in transverse rows, said filler bricks being each formed with two exposed parallel faces which are respectively convexly and concavely curved.

2. A checker brickwork construction for regenerator furnaces as claimed in claim 1

built up of filler bricks each formed as a segment having cylindrical lateral faces of the same radius of curvature and convexly and concavely curved ends of a radius of curvature equal to the radius of curvature of the lateral faces.

3. A checker brickwork construction as claimed in claim 1 built up of filler bricks of two forms, one in the form of a segment having convex and concave lateral faces of the same radius of curvature, parallel top and bottom sides, and parallel ends at right angles to the sides, and the other in the form of a flat slab having parallel top and bottom sides and convex and concave ends of the same radius of curvature, equal to the radius of curvature of the lateral faces of the first mentioned form.

4. As an element of a checker brickwork construction for regenerator furnaces a filler brick in the form of a prism segment having parallel faces which are respectively convexly and concavely curved cylindrical faces of the same radius of curvature.

5. A filler brick as claimed in claim 4 of generally rectangular form as seen in at least one elevational view thereof.

6. A filler brick as claimed in claim 4 having convexly and concavely curved ends.

7. A checker brickwork construction for regenerator furnaces comprising superposed courses of filler bricks each of simple prismatic form presenting only six ruled surfaces, the bricks in each course being arranged in T-relation to present a plurality of gas passages of substantially rectangular form in horizontal section and substantially the same horizontal cross sectional area throughout, said passages being uninterrupted by projections and presenting paths for the gases such that the gases are deflected by at least two walls of each passage.

8. A checker brickwork construction for regenerator furnaces as claimed in claim 7 in which one of the surfaces of each filler brick of a set is concavely curved and the surface parallel to said first mentioned surface is convexly curved to the same radius as said first mentioned surface, and the remaining surfaces of the brick are plane.

9. A checker brickwork construction for regenerator furnaces as claimed in claim 7 in which two parallel lateral faces of each filler brick of a set are respectively concavely and convexly curved, the end faces are respectively concavely and convexly curved, and the two remaining faces are plane.

In testimony whereof I have signed my name to this specification.

WILLIAM BOYD MITCHELL.