

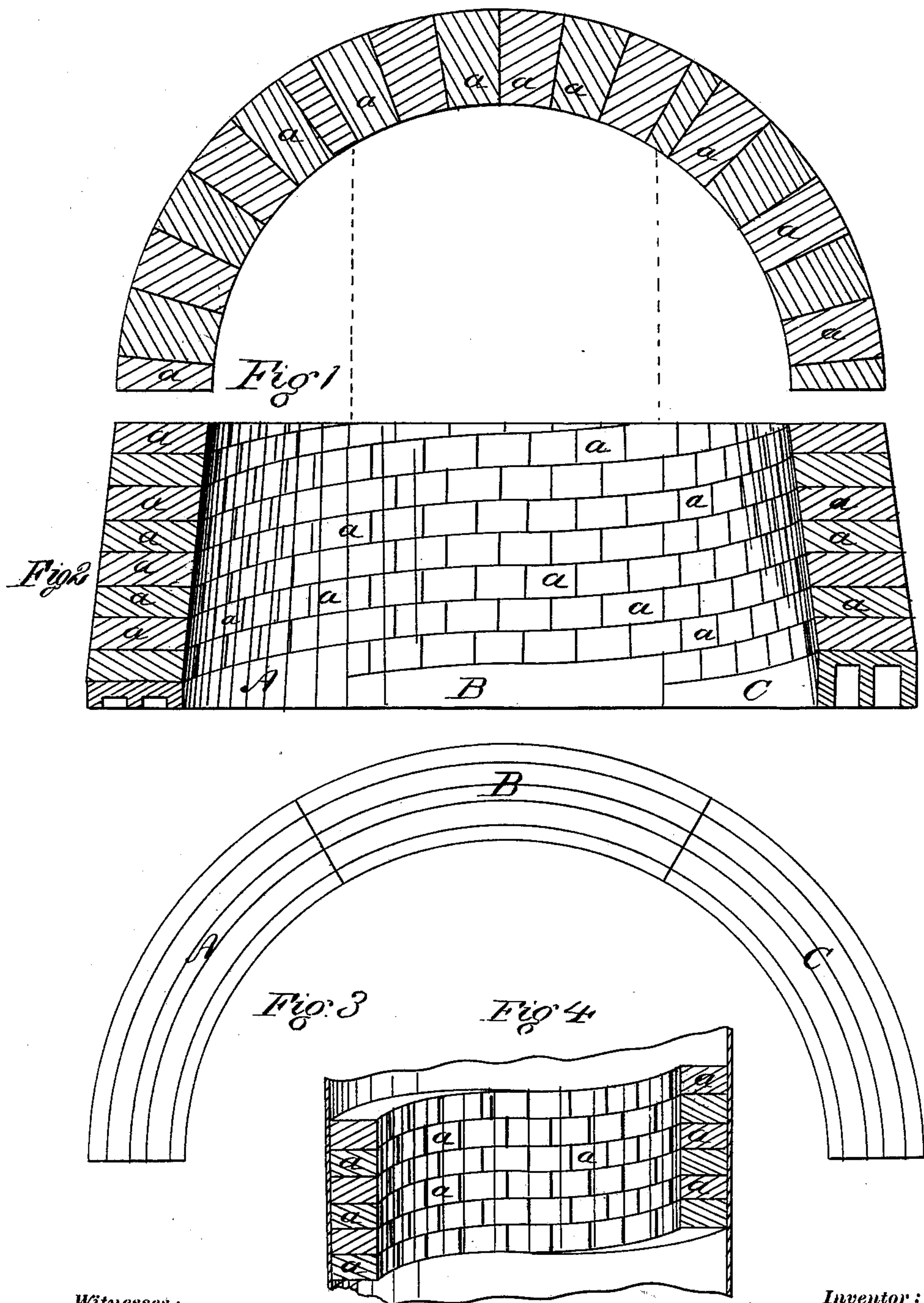
(No Model.)

2 Sheets—Sheet 1.

W. I. MANN & R. R. SINGER.
Method of Laying Brick Linings.

No. 229,724.

Patented July 6, 1880.



Witnesses:

J. Connolly,
A. Connolly.

Inventor:

Wm. I. Mann
R. R. Singer
By Connolly, Proctor & Fitch
attys.

(No Model.)

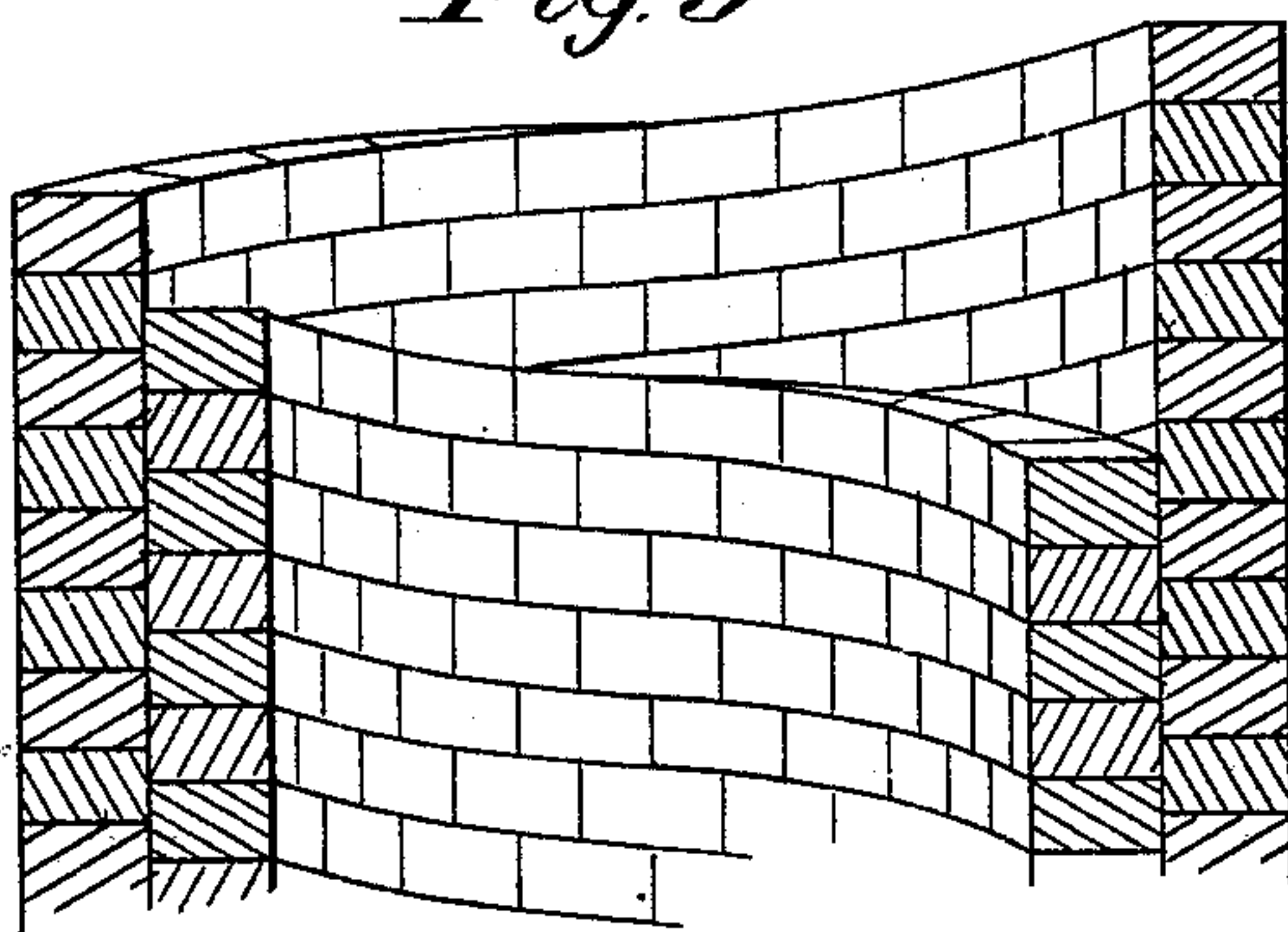
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Fig. 5



Witnesses:

S. S. Kane
J. H. Fisher

Wm. I. Mann
Robt. R. Singer
Inventors

By Connolly Bros & Co
attys.

UNITED STATES PATENT OFFICE.

WILLIAM I. MANN AND ROBERT R. SINGER, OF PITTSBURG, PENNSYLVANIA.

METHOD OF LAYING BRICK LININGS.

SPECIFICATION forming part of Letters Patent No. 229,724, dated July 6, 1880.

Application filed April 3, 1880. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM I. MANN and ROBERT R. SINGER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in the Method of Laying Brick Linings, of which we declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, in which like letters of reference indicate like parts.

Figures 1 and 2 are respectively a plan and sectional elevation of part of a blast-furnace lining built by our method. Fig. 3 is a bottom view of segmental castings supporting the brick-work. Fig. 4 is a sectional view of a part of a pipe lined according to our invention. Fig. 5 is a vertical sectional elevation of modification.

Our invention relates to the laying of brick-work in lining furnaces, wells, sewers, blast-pipes, hot-blast ovens or stoves, and analogous structures.

It consists in a furnace-lining constructed of brick-work in continuous helical or spiral courses, whereby the courses can be rapidly laid without stopping to fit ends together, in combination with a suitable foundation for such helical courses.

We will illustrate our invention as applied, in the manner we most prefer, to the inner lining of a blast-furnace. As a foundation and proper guide for the workmen, we provide the segmental castings A B C, &c., in any desired number, each being part of a circle or other curve, and having their upper surface inclined and laid together, as shown, with the highest point of one overtopping the lowest point of the adjoining segment by the thickness of one or more bricks. We prefer to so proportion the length of each segment to the width of the brick *a* to be used that when the latter are laid upon one segment the last brick will either fall short of the end of the segment or overhang it, so as to break joint continuously with the course laid on the adjoining segment. By employing as many bricklayers as we have segments they can follow each other in succession without delaying to finish courses by breaking bricks. In this manner, one course being laid on segments A and B, the second course on segment B is simply a continuation

of the first course laid on A, and which finds its continuation in the third course laid on segment C, and so on. We therefore have endless courses running spirally to the top, there being as many independent courses as there are segments at the starting-point; or, by using a single pitch at the base, we can produce a single continuous course winding around the structure from bottom to top.

A structure thus built in continuous courses is much stronger than if built in the usual horizontal courses. In the latter construction the last few bricks laid to complete each course must be chipped or broken to complete the circle or curve properly. With our invention not a single brick need be broken from the foundation to the capping. This avoidance of breaking and chipping every few inches of vertical height becomes a very considerable economy in the erection of such a large structure as a blast-furnace. There is also obviously a great saving of time and labor, which sometimes is of the utmost importance.

The foundation may be of cast-iron, stone, tile, or other material, having its upper surface pitched to helical lines.

The invention is applicable to many different structures, among which may be enumerated linings for blast-furnaces, downcomers, blast-pipes, domes, cementation-furnaces, sewers, wells, vaults, tunnels, &c.

The curve to be constructed being known, we determine the number of helices or spiral courses best adapted to the circumstances and establish the pitch by suitable calculations. Having done this, we cast or form the helicoidal segments A B C, &c., and proceed to lay the courses continuously from them.

Another feature of our invention is its peculiar fitness for double-walled structures. In such case we have two foundations, or one formed in two ways. One has the helical pitch in one direction and the other in the opposite direction. We have thus an independent bond in each wall, the courses being helical in both, but in opposite directions.

We claim as our invention—

1. A lining for furnaces and analogous structures, composed of bricks laid in continuous helical or spiral courses, combined with foundation segments or plates having their upper

surfaces conformed to the pitch of the courses, substantially as described.

2. A foundation for helical courses in brick structures, consisting in segments or plates
5 having their upper surface pitched to one or more ascending spirals, substantially as described.

3. A double-walled brick structure, composed of two walls helically coursed, the re-

spective courses of both walls running in opposite directions.

In testimony whereof we have hereto set our hands.

WM. I. MANN.

ROBERT R. SINGER.

Witnesses:

FRANCIS RUSSELL,
JAS. A. RUSSELL.