

No. 652,461.

Patented June 26, 1900.

E. KERR & W. R. BROWN.

BOSH PLATE.

(Application filed June 29, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

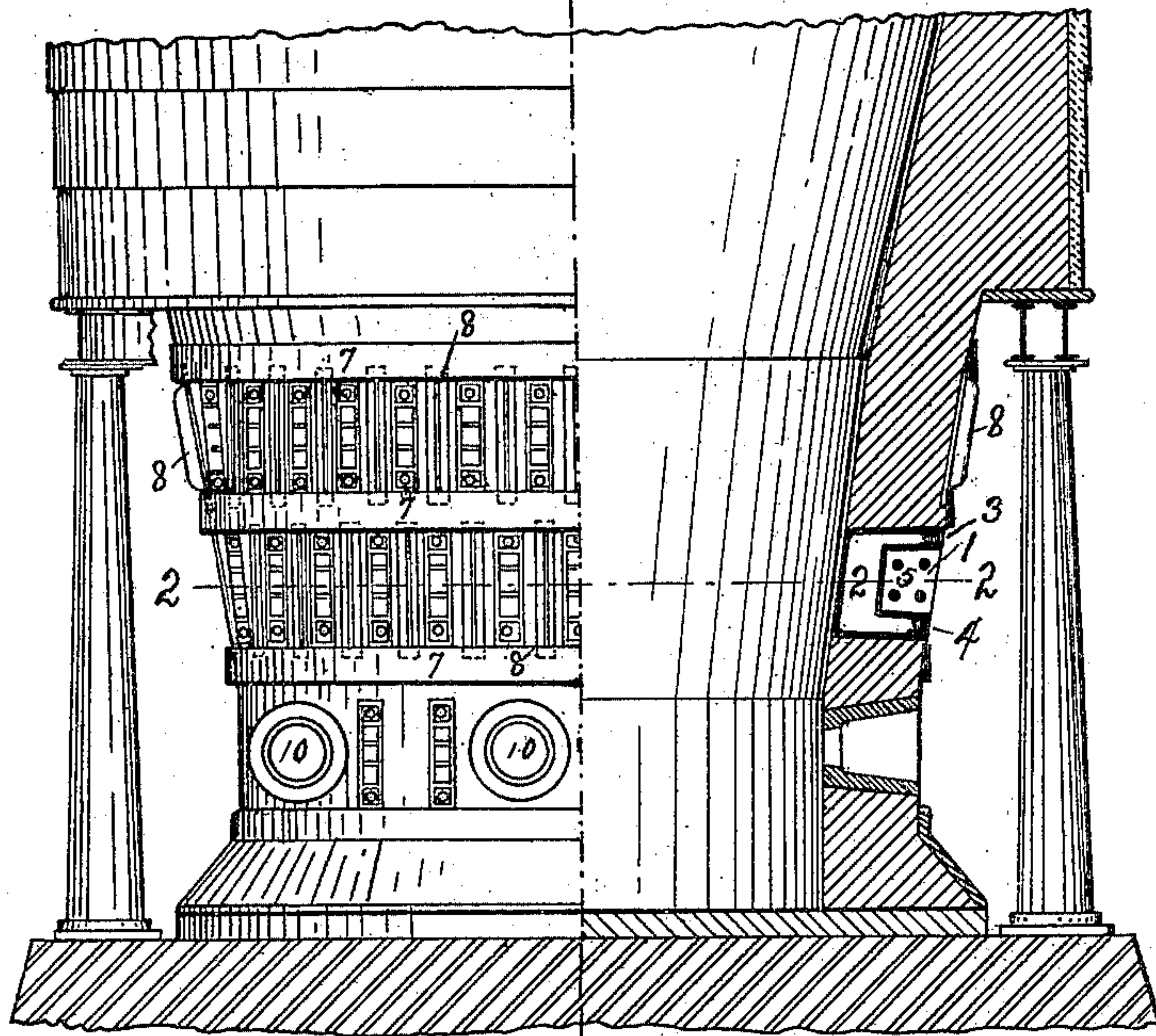
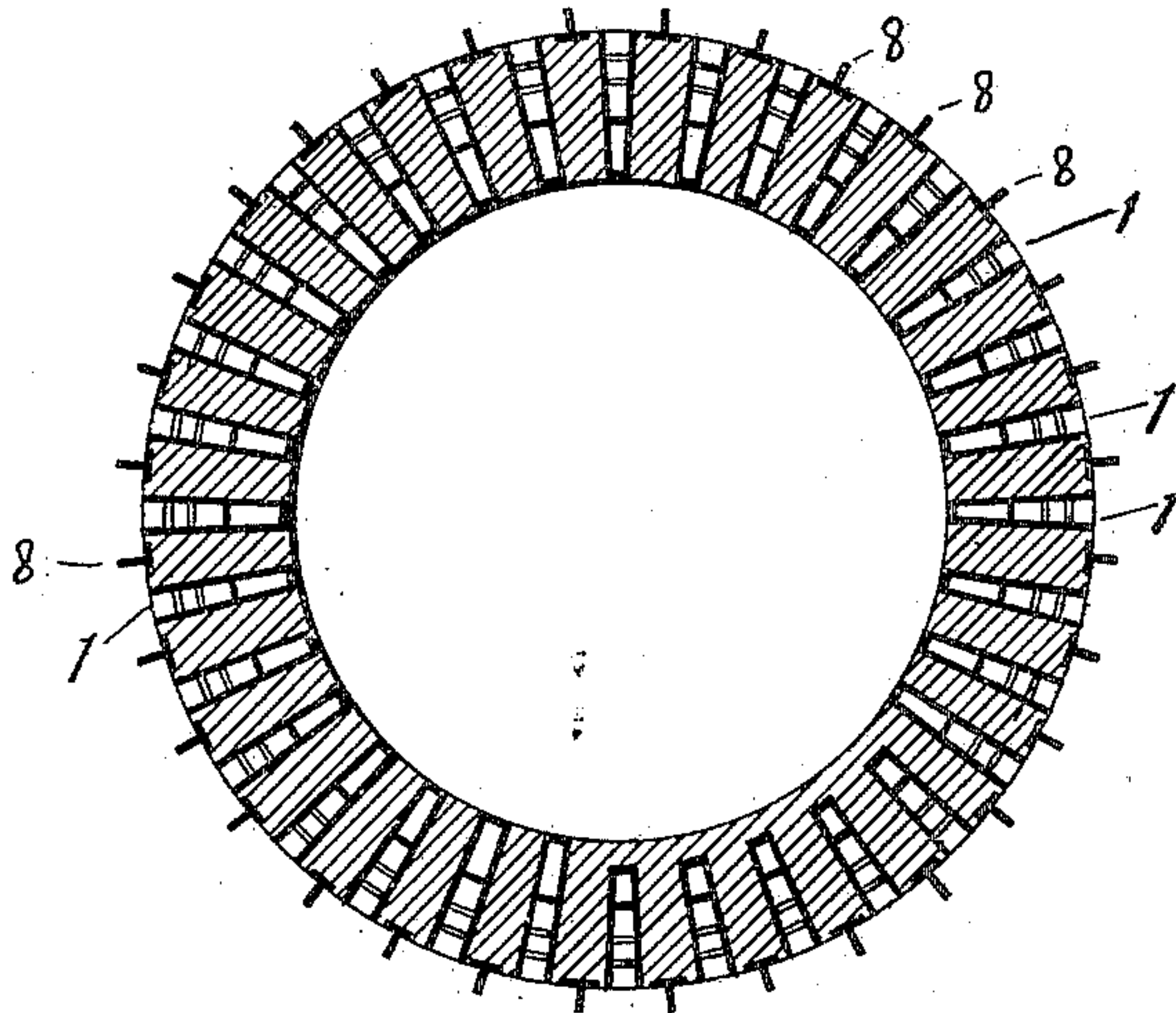


Fig. 2.



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Fig. 3.

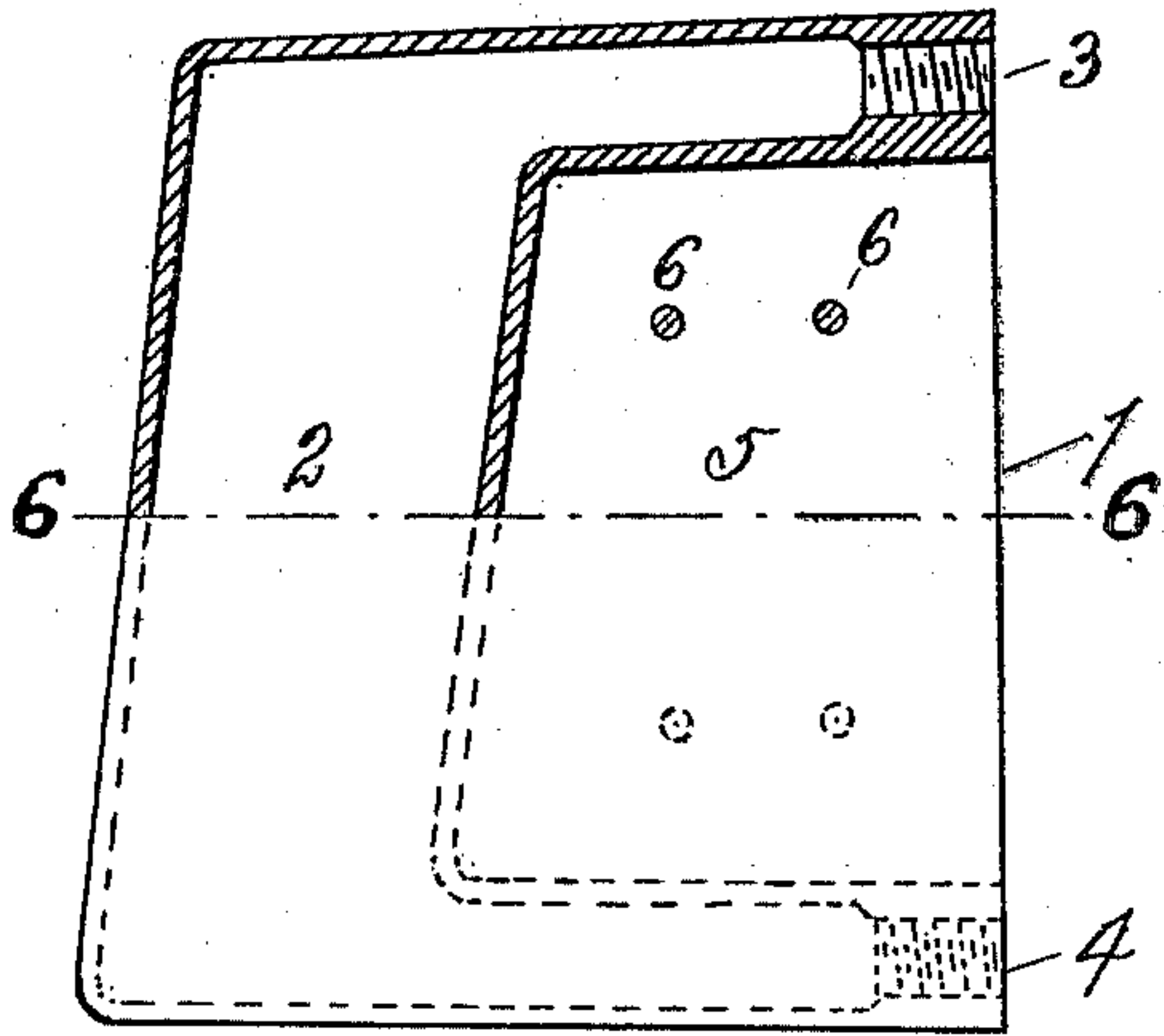


Fig. 4.

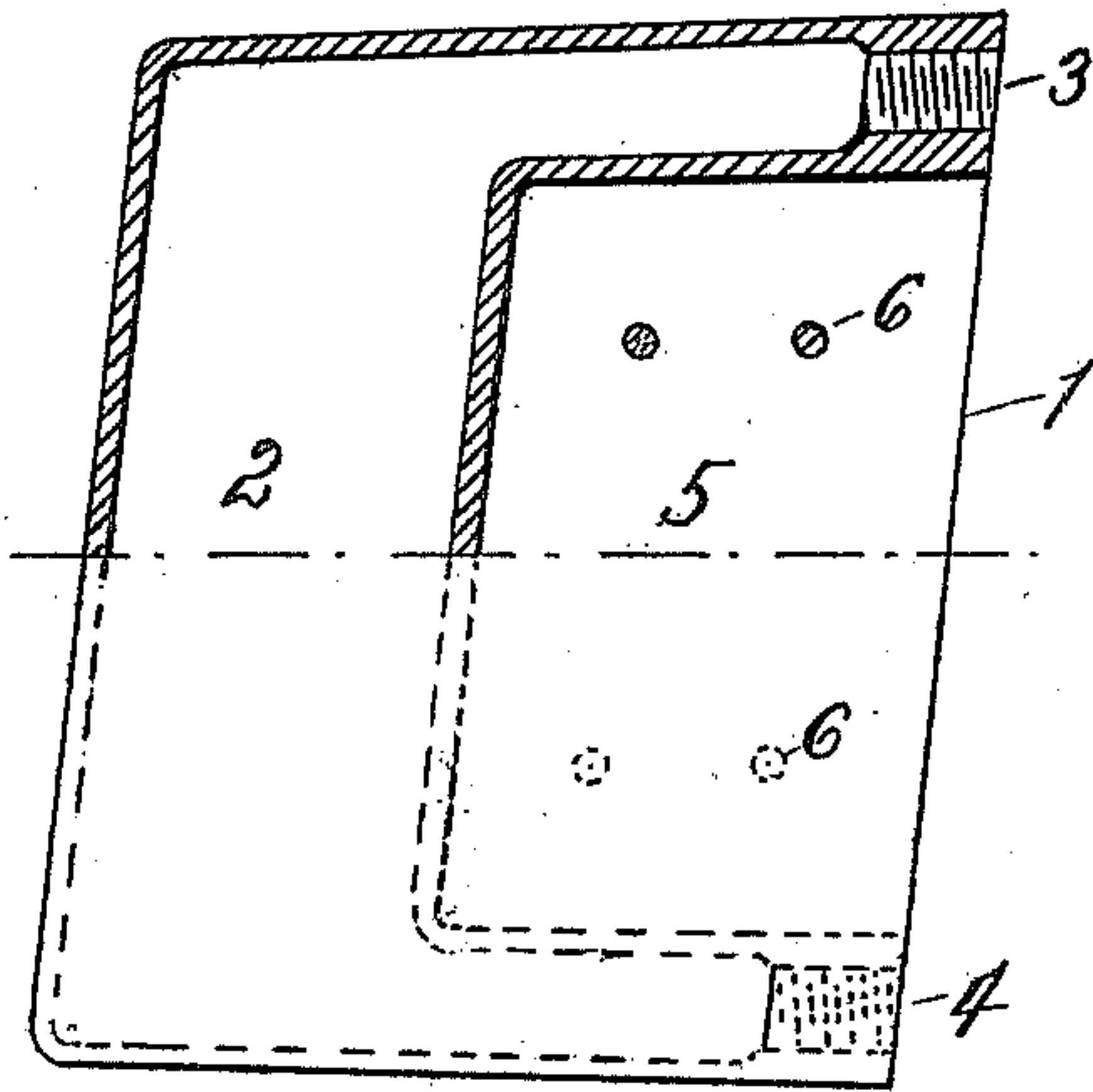


Fig. 6.

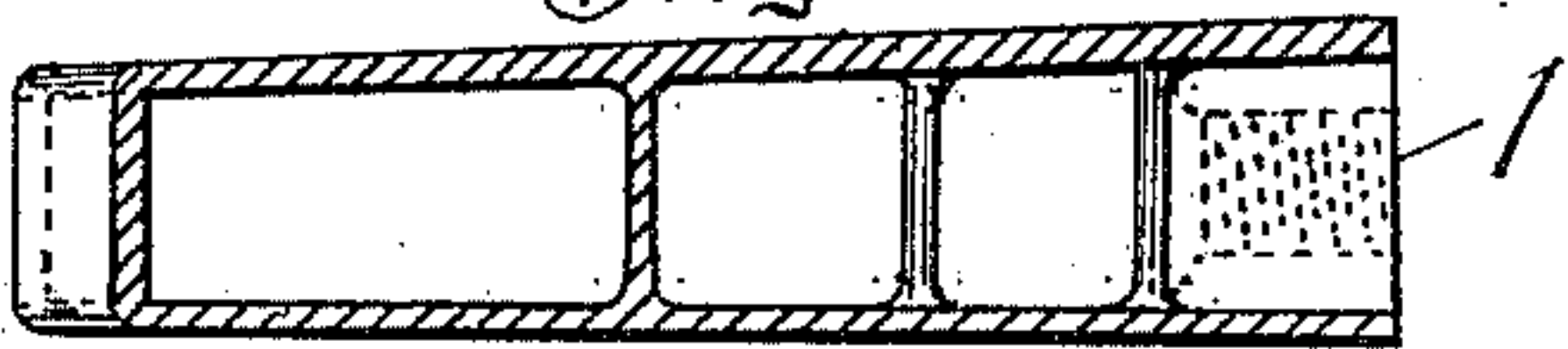


Fig. 5.

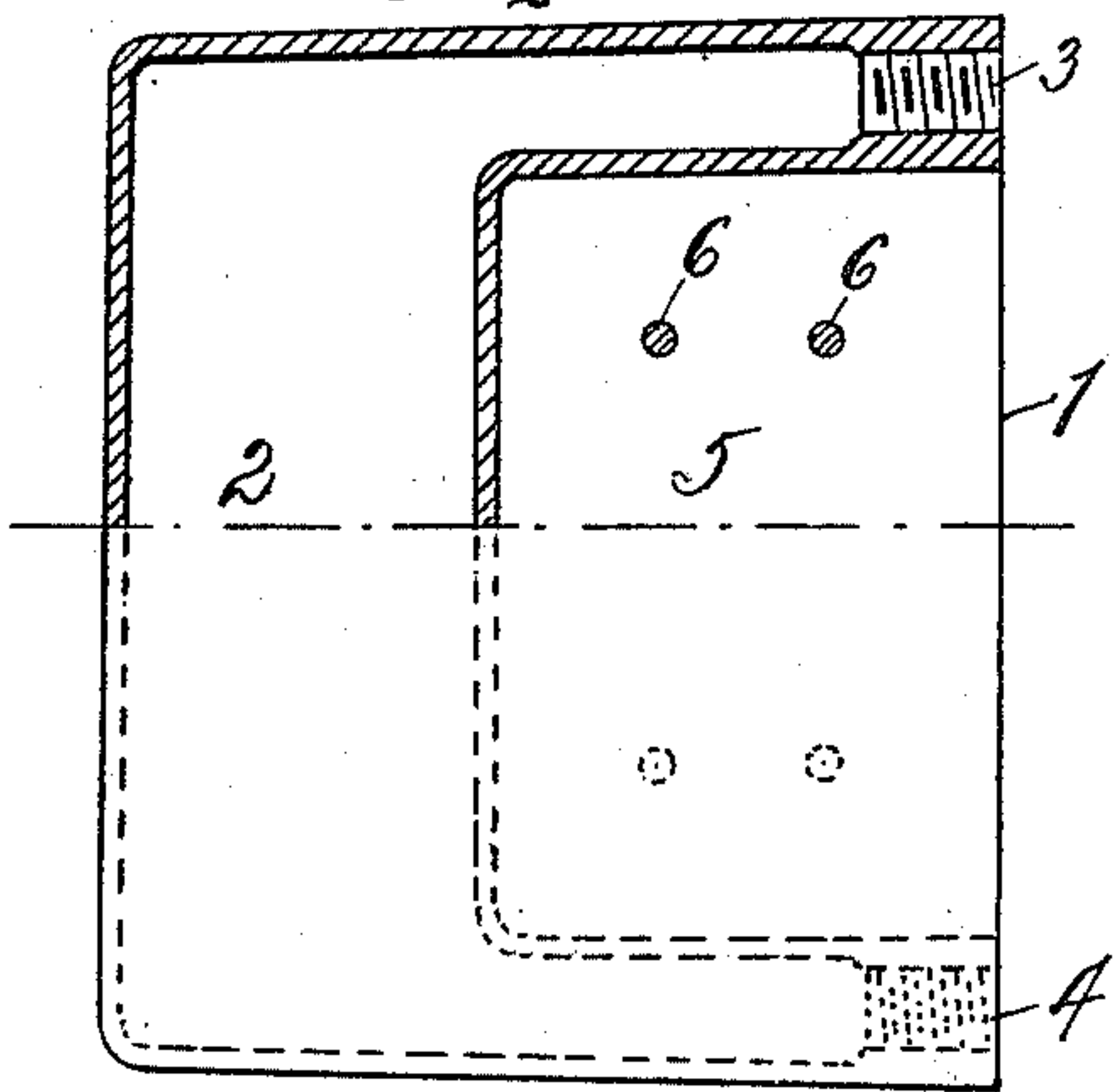
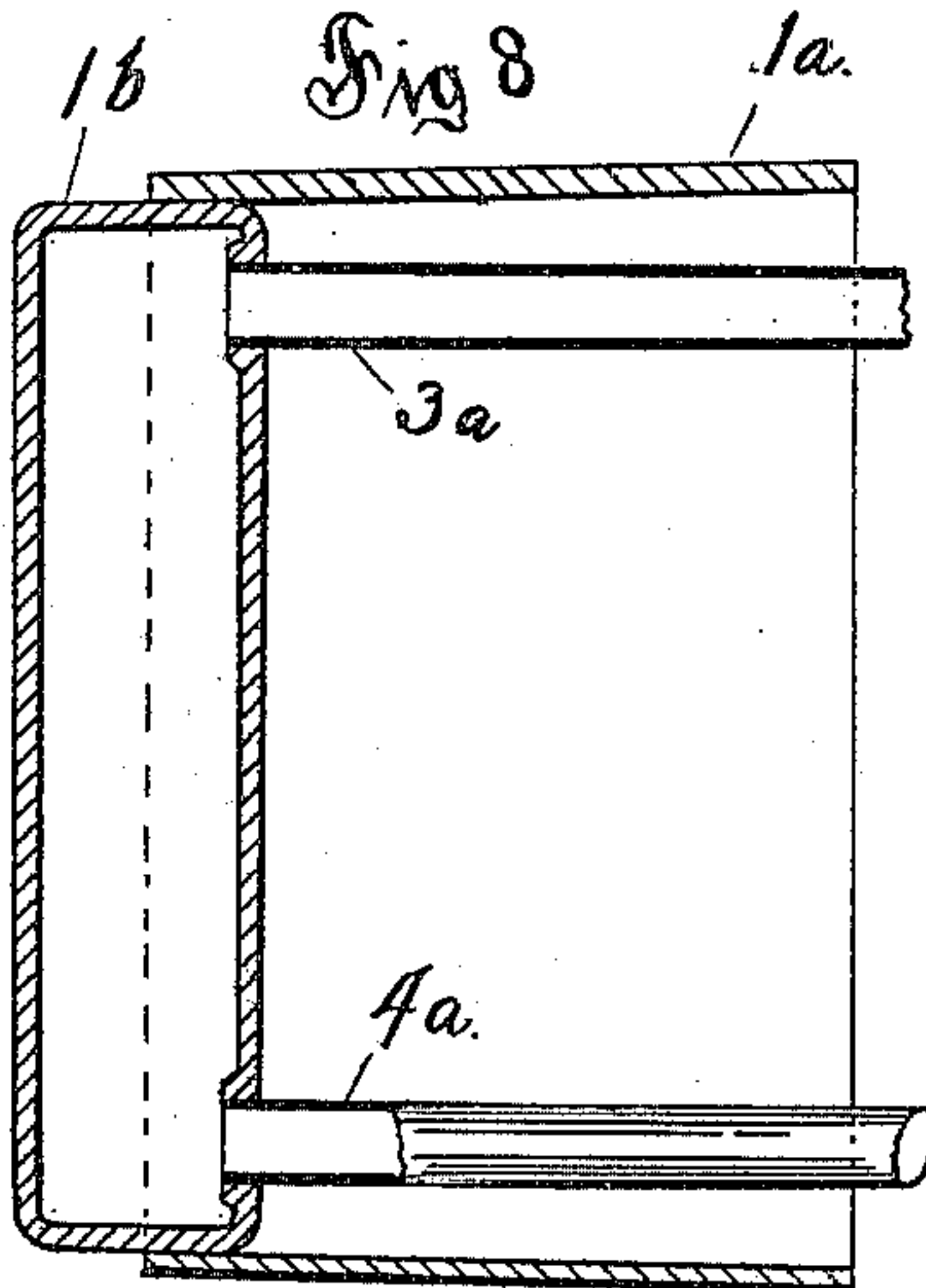


Fig. 7.



Fig. 8.



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# UNITED STATES PATENT OFFICE.

EDWARD KERR AND WILLIAM R. BROWN, OF PITTSBURG, PENNSYLVANIA.

## BOSH-PLATE.

SPECIFICATION forming part of Letters Patent No. 652,461, dated June 26, 1900.

Application filed June 29, 1897. Serial No. 642,811. (No model.)

*To all whom it may concern:*

Be it known that we, EDWARD KERR and WILLIAM R. BROWN, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Bosh-Plates, of which the following is a specification.

In the accompanying drawings, which make part of this specification, Figure I is a broken elevation, partially in section, of a furnace fitted with our invention. Fig. II is a sectional plan view of the same along the line 2 2 in Fig. I. Figs. III, IV, and V are elevations, partially in section, of our improved bosh-plate, showing various external contours to fit the different furnace shapes. Fig. VI is a sectional view along the line 6 6 in Fig. III. Fig. VII is a rear end elevation of the same, and Fig. VIII shows a modified construction of our bosh-plate.

Generally speaking, our invention consists of a new and improved bosh-plate set vertically in the wall of a blast-furnace and a novel arrangement of horizontal bands and vertical buckstaves interposed between adjacent bosh-plates.

The following is a detailed description of our invention:

1 is our bosh-plate of horizontal top and bottom and inwardly-tapering sides. We prefer to construct our bosh-plate about eighteen inches in height and about four inches in width at the inner face.

2 is a vertical passage in bosh-plate for the cooling medium adjacent to the inner face of said bosh-plate, provided with connections at 3 and 4, 4 being preferably the inlet and 3 the outlet, so that any steam generated in passage 2 will readily pass out through outlet 3. In the rear portion of the bosh-plate 1 is air-chamber 5, open at its rear and provided with horizontal strengthening-studs 6 6.

In Fig. VIII a modification of our bosh-plate is shown, consisting of the hollow plate 1<sup>a</sup>, open at both front and rear, in the front of which is seated a chamber for the cooling medium 1<sup>b</sup>, fitted with water connections 3<sup>a</sup> and 4<sup>a</sup>. The case 1<sup>a</sup> may be made of cast-iron, and the chamber 1<sup>b</sup>, alone, of bronze, thus cheapening the construction. In the case of this construction the chamber 1<sup>b</sup> may be in-

serted or withdrawn without disturbing frame 1<sup>a</sup>. We prefer not to place the inner faces of our bosh-plates in direct contact with the interior of the furnace, but prefer to have at least four inches of brickwork interposed. Fig. II shows both this arrangement and also bosh-plate extending completely through the furnace-wall.

The bosh-plates are set preferably about nine inches apart in horizontal rows in the wall of the furnace, and between said rows are placed horizontal bands 7 7, encircling the furnace, and between adjacent bosh-plates are placed vertical buckstaves 8 8, held in place by bands 7 7, serving to strengthen the furnace-wall.

10 10 are the twyers, one or more bosh-plates being interposed between adjacent twyers.

The benefits of our invention, *inter alia*, are as follows: No special form of brickwork nor arched or modified construction of the furnace-wall is required in the use of our device the bosh-plate, with its horizontal top and bottom and inwardly-tapering sides, being simply built into the wall of the furnace. The narrowness of the aperture left by the withdrawal of our bosh-plate avoids the dropping out and down of the bricks and the disturbance of the wall usually attendant on the withdrawal of the old form of horizontally-set bosh-plates. The novel form of our bosh-plate renders its withdrawal and insertion a very simple and easy operation unattended by any disturbance of the adjacent wall. Again, a much larger number of our form of bosh-plate than of the horizontally-set bosh-plate may be introduced into a furnace-wall, and accordingly a much greater cooling surface procured without weakening the structure. In the use of the horizontally-set bosh-plates much trouble is experienced in the burning out of hollows or pockets in the brickwork exposed between the rows of bosh-plates, which hollows or pockets become bridged over with deposits of slag, &c., and filled with gas. Explosions result, often causing great damage and loss of life. The areas of brickwork between the rows of bosh-plates in furnaces fitted with our invention and also between the individual bosh-plates are so small and narrow and so well cooled by the



adjacent bosh-plate that the formation of such pockets is impossible.

In the annexed claims by the term "width" we mean the horizontal dimension of the bosh-plate from side to side and not its horizontal dimension from front to back through the furnace-wall, which is more properly called its "depth."

Having described our invention, what we claim is—

1. A furnace-wall having a series of bosh-plates set therein, said bosh-plates having their vertical axes sufficiently greater than the axes of their width so that no bridge-arch shall be required in the furnace-wall over the bosh-plate opening to support the superincumbent masonry, and means for introducing a cooling medium into said plates.

2. A furnace-wall having a series of bosh-plates set therein; said bosh-plates having their vertical axes sufficiently greater than the axes of their width so that no bridge-arch shall be required in the furnace-wall over the bosh-plate opening to support the superincumbent masonry; an inner chamber for the respective bosh-plates with suitable connections for a cooling medium and an open air-chamber forming the rear of such plates.

3. A furnace-wall having a series of bosh-plates set therein, said bosh-plates having

their vertical axes sufficiently greater than the axes of their width so that no bridge-arch shall be required in the furnace-wall over the bosh-plate opening to support the superincumbent masonry; said bosh-plates having horizontal tops and bottoms with inwardly-tapering sides, and means for passing a cooling medium through said bosh-plates.

4. A furnace-wall having a series of bosh-plates set therein, said bosh-plates having their vertical axes sufficiently greater than the axes of their width so that no bridge-arch shall be required in the furnace-wall over the bosh-plate opening to support the superincumbent masonry; said bosh-plates having horizontal tops and bottoms with inwardly-tapering sides and respectively provided at their inner side with a chamber for the passage of a cooling medium and at their outer side with an open air-chamber and with horizontal strengthening-lugs in said open air-chamber.

In testimony whereof we have hereunto set our hands this 21st day of June, A. D. 1897.

EDWARD KERR.  
WILLIAM R. BROWN.

Witnesses:

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