

T. J. MITCHELL.

COKE OVEN.

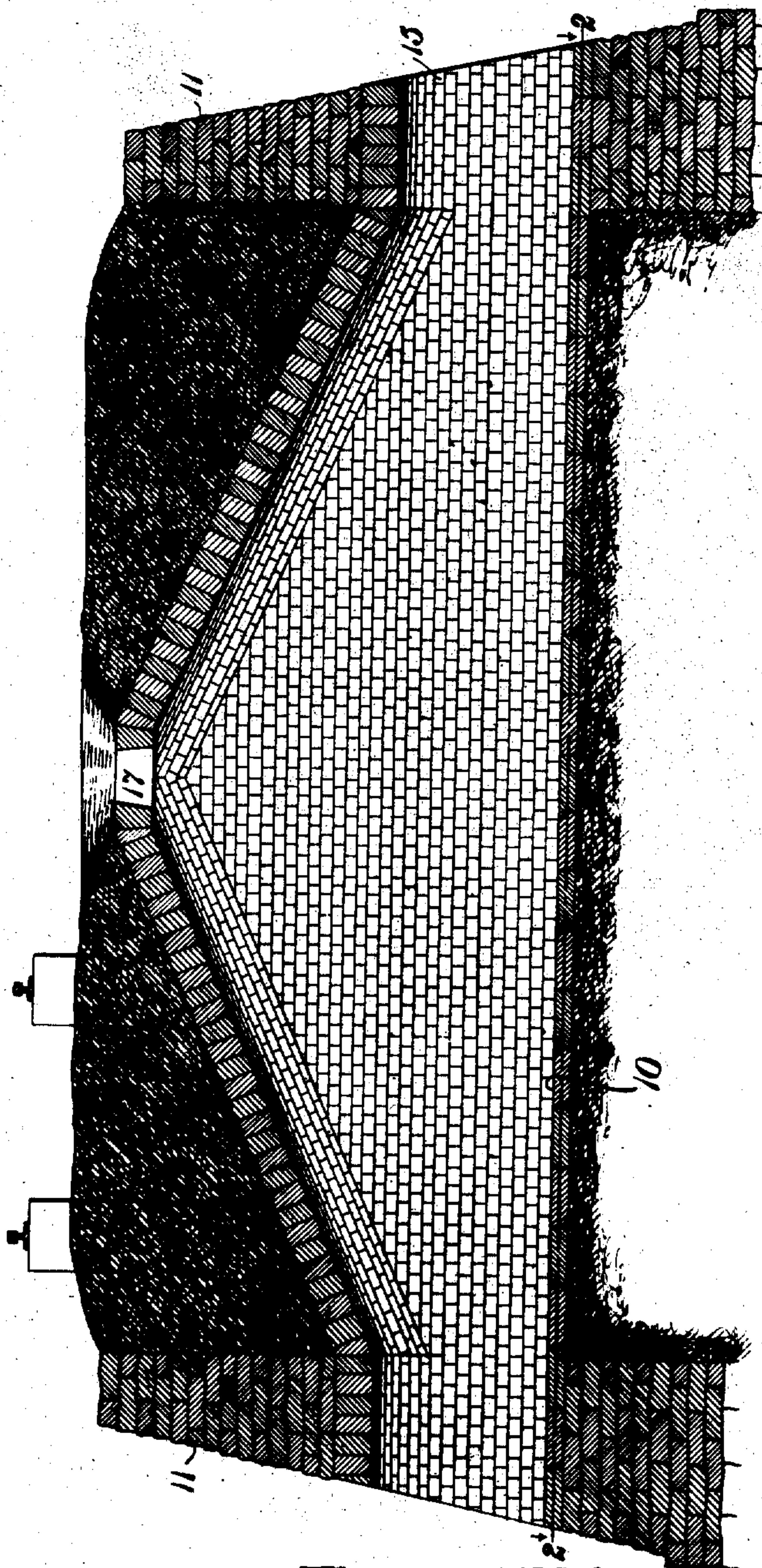
APPLICATION FILED NOV. 27, 1906.

Patented Sept. 29, 1908

3 SHEETS—SHEET 1

899,886.

Fig. 1.



WITNESSES:

E. H. Stewart
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By

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3 SHEETS—SHEET 2.

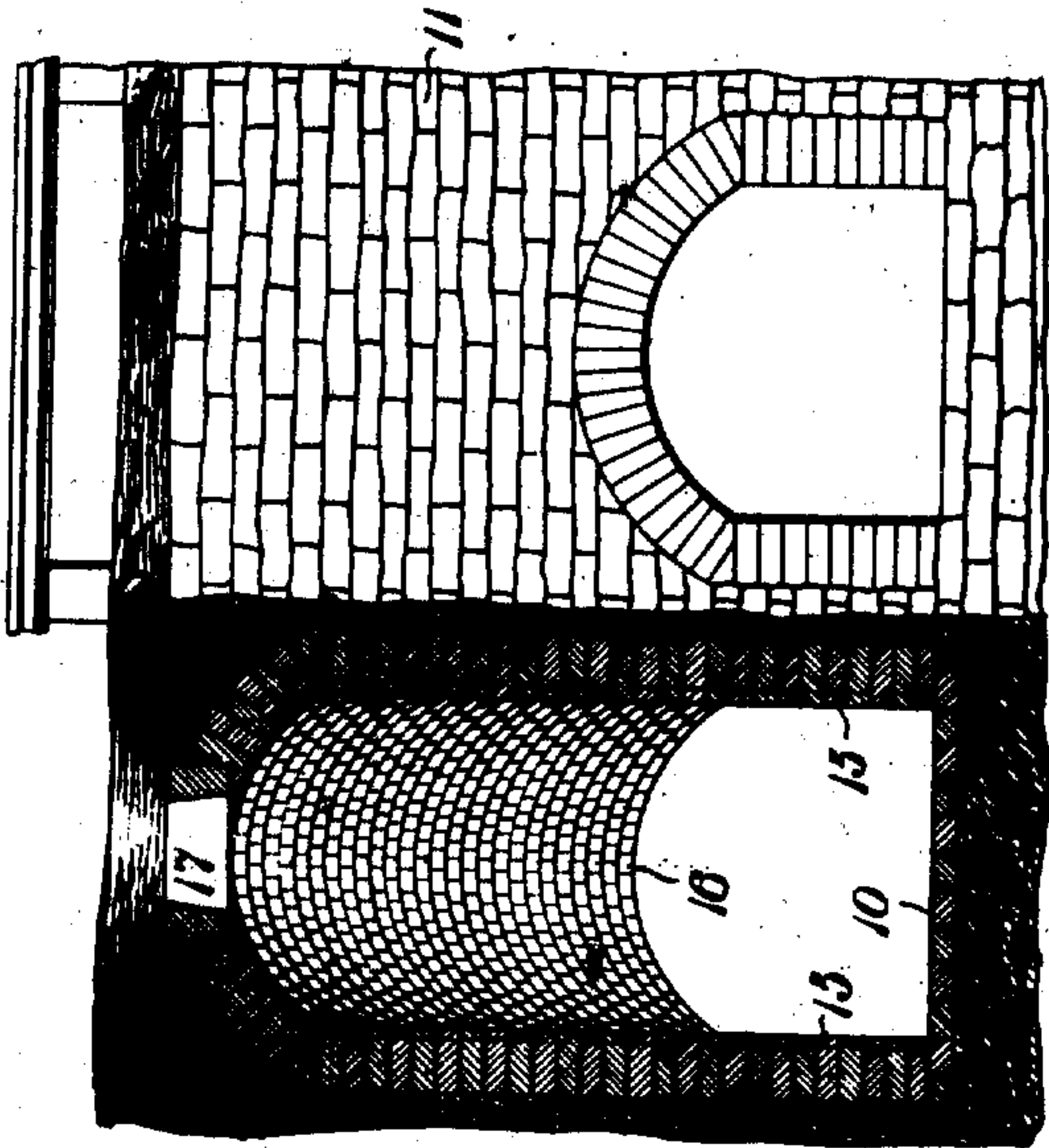


Fig. 3.

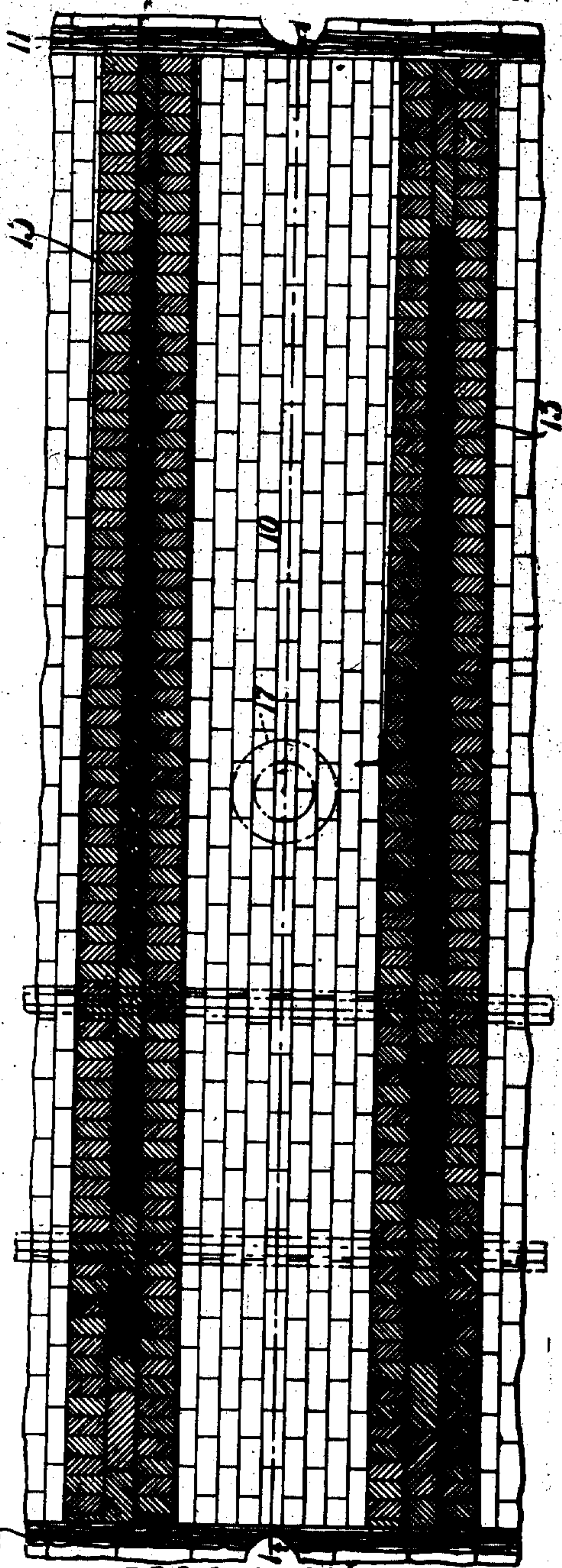


Fig. 2.

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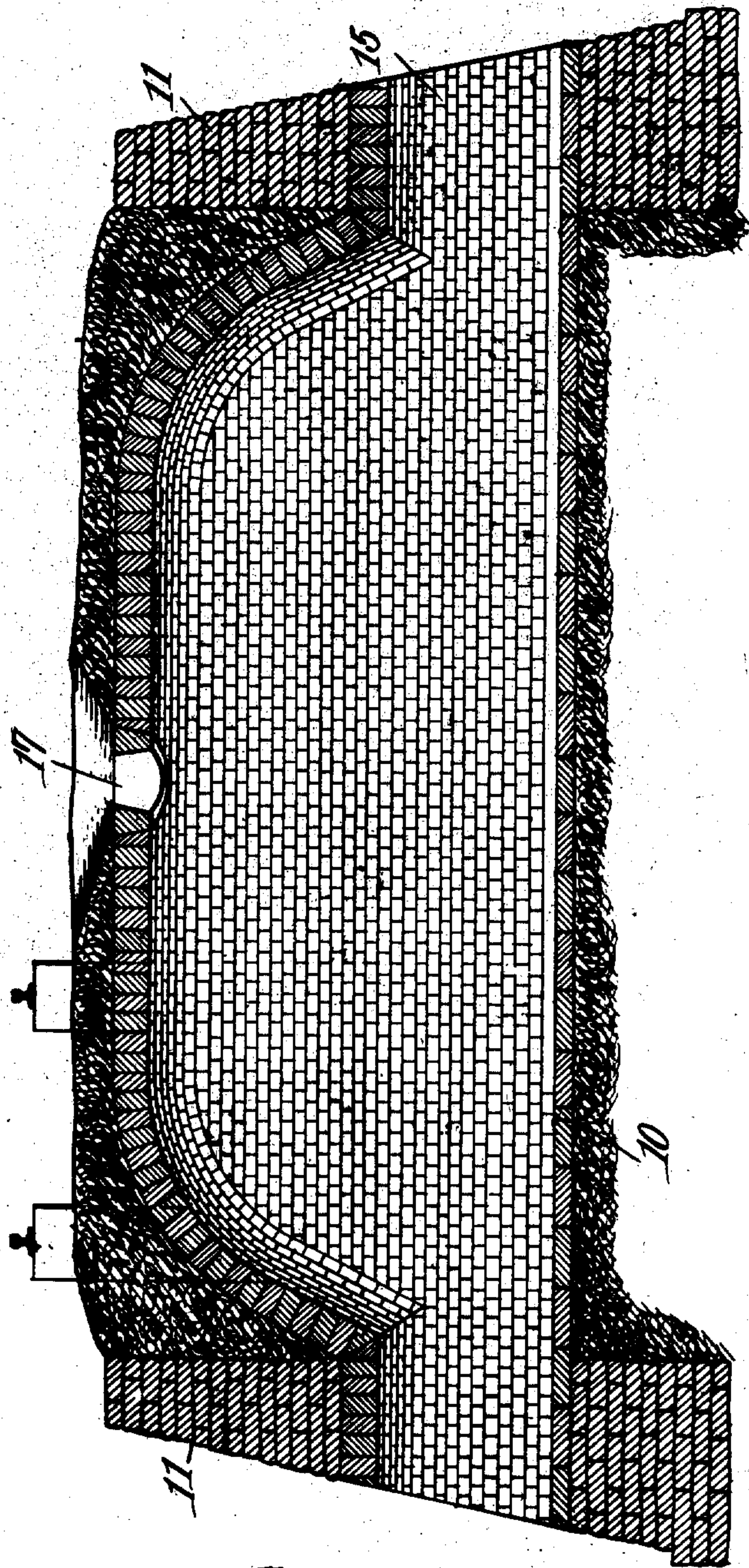
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3 SHEETS—SHEET 3.

Fig. 4



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UNITED STATES PATENT OFFICE.

THOMAS J. MITCHELL, OF CONNELLSVILLE, PENNSYLVANIA.

COKE-OVEN.

No. 899,886.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed November 27, 1906. Serial No. 345,308.

To all whom it may concern:

Be it known that I, THOMAS J. MITCHELL, a citizen of the United States, residing at Conneltsville, in the county of Fayette and State of Pennsylvania, have invented a new and useful Coke-Oven, of which the following is a specification.

This invention relates to coke ovens, and has for its principal object to provide an oven of simple construction which may be built, maintained in working order, and operated at a much smaller cost than an ordinary beehive and other types of ovens now in use.

A further object of the invention is to provide an oven open at both ends for the insertion of a coke pusher at one end, and the discharge of the coke at the opposite end, the top or crown of the oven being inclined or curved upward from a point near each end to a point about the middle of the length of the oven wall, and at this point is a top opening through which the oven may be charged.

A still further object of the invention is to provide an oven of this type in which the top or crown is inclined or curved upward from points near the opposite ends toward the center to form a combustion chamber for the more perfect combustion of the gases distilled from the coking coal and by which combustion the crown or roof of the oven becomes intensely heated, thereby increasing the efficiency of the oven by reflecting the heat downward on the coking coal, and result in a superior quality of coke, and, will, furthermore, permit the consumption of the gases without material waste of the carbon of the coal.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a longitudinal sectional view of a coke oven constructed in accordance with the invention. Fig. 2 is a sectional plan view of the same. Fig. 3 is an end elevation partly in section of the oven. Fig. 4 is a view corre-

sponding to Fig. 1 illustrating a slight modification in the construction of the oven.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The floor 10 of the oven is flat and slightly inclined toward one end and extends between two walls 11 formed of brick or stone, the oven opening at both ends, so that a pusher may be inserted at one end and forced through the oven to discharge the coke. The side walls 15 are vertical and are substantially parallel with each other throughout their entire length, while the crown 16 is arched from side wall to side wall. From each end of the oven the arch extends inward for about the thickness of the retaining walls, and thence slopes or curves upward at each end toward a point about mid-way of the length of the oven, and at this point is an opening 17 through which the coal may be inserted to form the charge.

The shape of the crown is such that the entire charge may be dumped in, the inclination being sufficient to accommodate the angle of pile of the charge of coal to some extent, and after the insertion of the charge the central or highest point is trimmed in order to render the thickness of the layer of the charge approximately equal throughout. The construction of the sloping crown of the oven affords a combustion chamber for the burning of the gases which are distilled from the coking coal, thereby producing the requisite heat for rapid and perfect coking, and the heat is reflected downward on the coking coal, producing a superior quality of silvery coke. The air necessary to support combustion is admitted through both ends of the oven, so that the heat is practically uniform throughout, and the quantity of air admitted may be governed in the usual manner by closing the end openings to a greater or less extent. The charge opening is not closed during the entire coking process, and the gases distilled from the quantity of coal are consumed as rapidly as they are formed, thus maintaining the necessary heat without consuming any of the solid carbon of the coal. After the coking operation is complete, the brick work at the ends of the oven is knocked down and streams of water are turned into the oven to extinguish the flame and cool down to the proper temperature for discharging the finished product. A suitable

pusher is then introduced through one of the openings at one end of the oven and the body of coke as a whole is forced out, thereby producing very large blocks of coke.

5 It is, of course, well known that coke in large blocks commands a much higher price than fine or small coke, and is practically essential in foundry work, and it is always the aim of the coke manufacturer to avoid crushing or breaking the coke into small particles. 10 With an oven constructed in accordance with the present invention, the entire body of coke may be discharged practically as one block, and afterwards broken into fragments of 15 suitable size for handling.

One of the most important features of the invention is the departure from the ordinary beehive type of oven now in common use, where there is difficulty in withdrawing the 20 product and difficulty in controlling even and perfect combustion. The oven forming the subject of the present invention is so arranged that the charge of coal may be dumped in and leveled off within a very 25 short time, while the necessary amount of air to support combustion is allowed to enter at both ends and the heat reflected from the sloped crown is sufficient to insure the quick generation of gases when the operation of 30 coking begins. In the ordinary beehive type of oven, it requires from three to five hours work of one man to withdraw the charge, and a large portion of the coke is broken into comparatively small fragments, while in an oven 35 constructed in accordance with the present invention the entire mass of coke may be forced out in practically a single block, and in less than a minute, thus not only saving time, but, also, saving considerable expense 40 by preventing the loss of heat, the oven being retained at a very high temperature, so that the coking process may recommence immediately after the dumping of another charge into the oven.

45 It will, of course, be understood that the shape of the roof of the oven may be altered in many ways without departing from the invention, and it may be sloped on straight lines, as indicated in Fig. 1, or on curved and 50 straight lines, shown in Fig. 4, or the roof

may be curved throughout, or otherwise so shaped that the vertical distance between the floor and the roof gradually increases from the doors inward.

I claim:—

1. A coke oven having a substantially level floor and parallel side walls higher in the middle than at the ends, said oven being open at both ends from wall to wall to provide an unobstructed, free passage from end 60 to end, and a crown sloping upward from the ends toward a point about midway of the length of the oven and there provided with a charging opening.

2. A coke oven having a substantially 65 level floor, end retaining walls each with an opening of the same size as the opening in the other wall, a crown sloping continuously upward from the end retaining walls to an approximately central point and there provided with a charging opening, said crown 70 being arched in a direction at right angles to the length of the oven, and parallel side walls extending through and from one opening to and through the other opening and approximately 75 to the top of the crown adjacent to the charging opening therein.

3. A coke oven having a central trunnel hole in its roof, the length of the oven chamber and the height of the roof being so 80 proportioned that, when the top of a charge of coal deposited by gravity through the trunnel hole reaches said trunnel hole, the charge when leveled off will fill the oven substantially to the level of the draft openings. 85

4. A coke oven having a substantially level floor and provided with parallel side walls, higher at the middle than at the ends, said oven being open at both ends from wall 90 to wall to provide an unobstructed, free passage from end to end, and a crown rising from the ends and provided about midway of its length with a trunnel hole.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature 95 in the presence of two witnesses.

THOMAS J. MITCHELL.

Witnesses:

J. M. SMITH,
J. L. HYATT.