

(No Model.)

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W. MITCHELL.
PORTABLE BAKE OVEN.

No. 582,362.

Patented May 11, 1897.

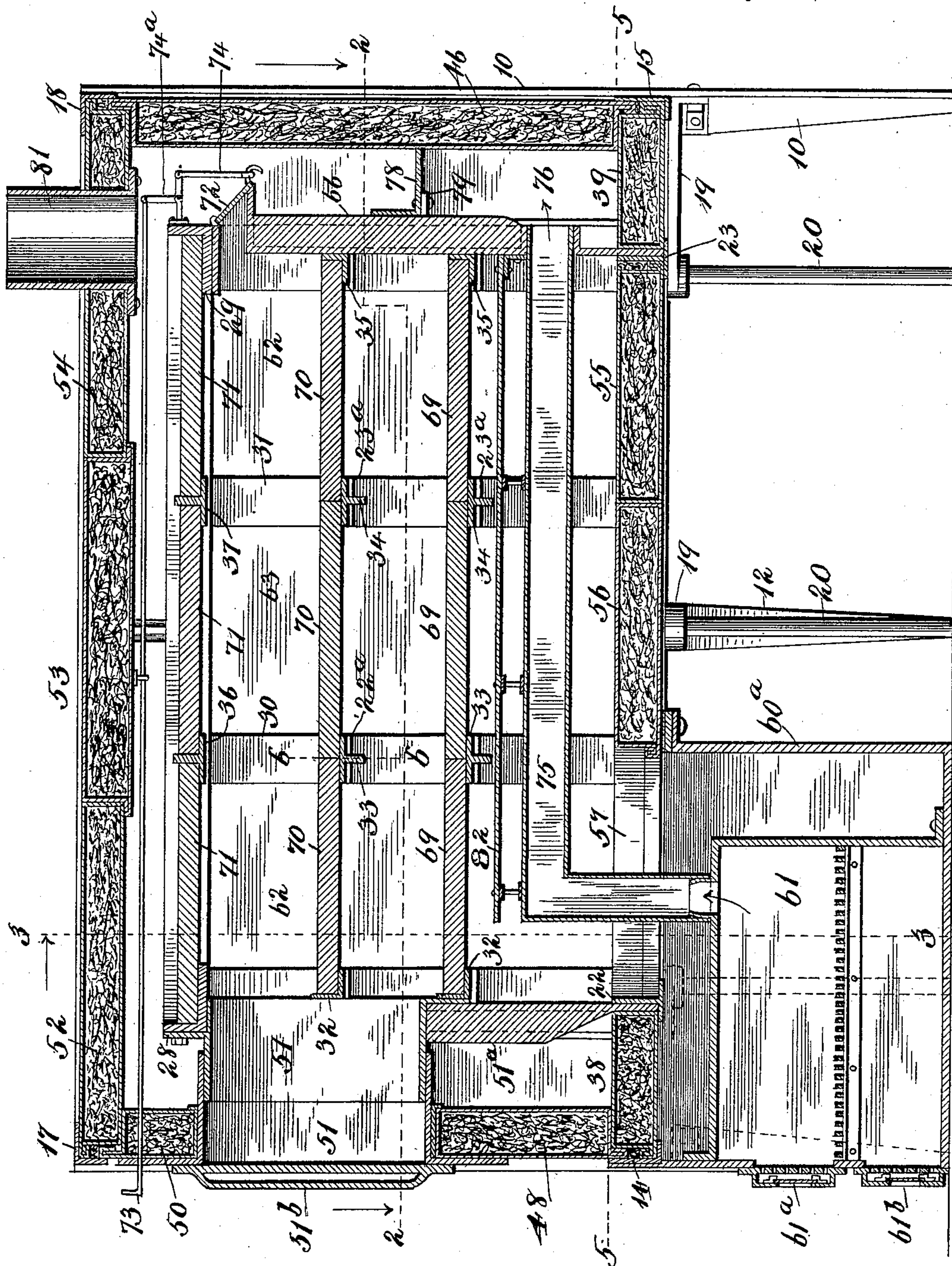


Fig 1

Witnesses
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C. H. Crawford

Inventor
William Mitchell
By Louis K. Gillman
att.

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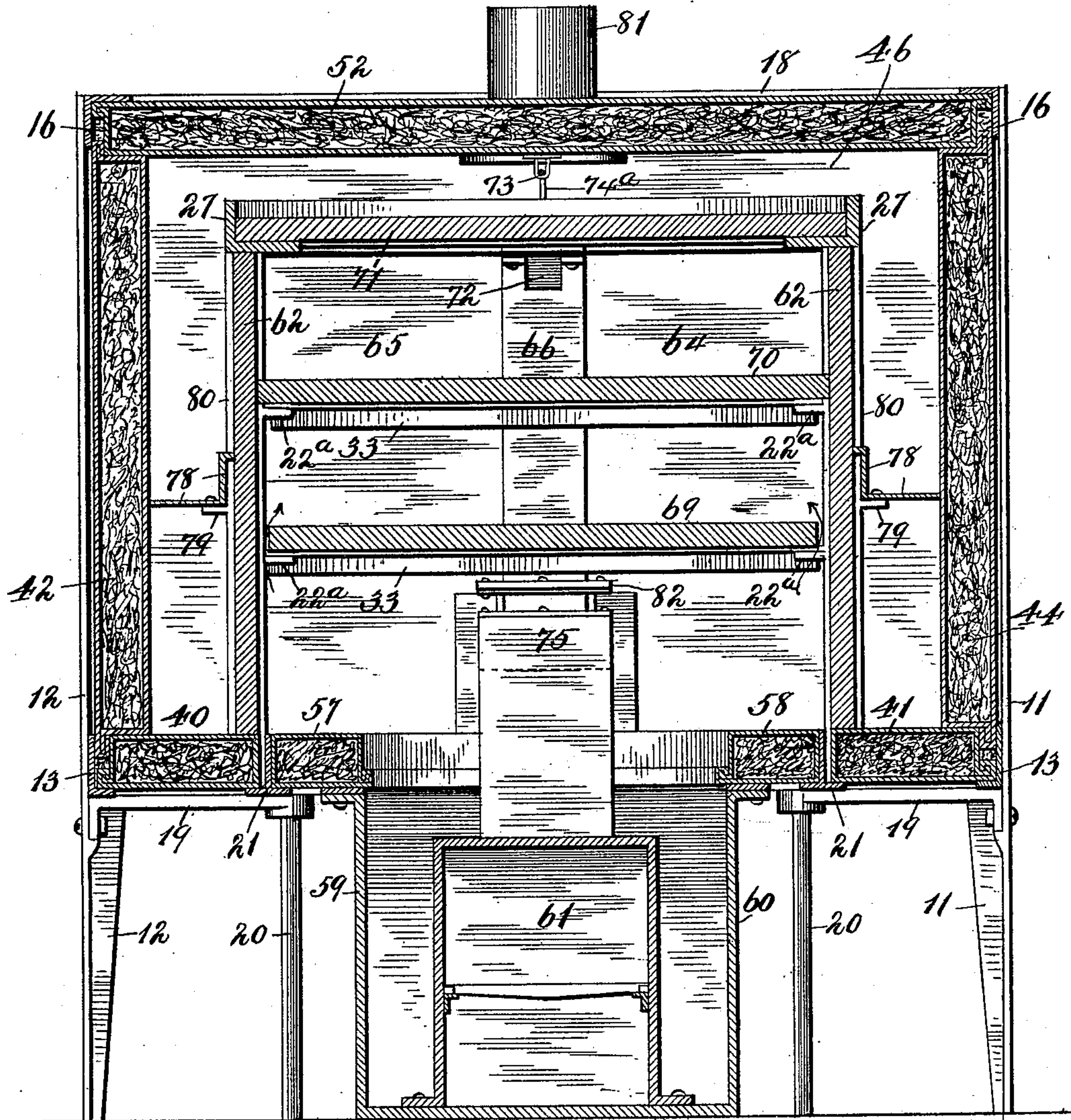


Fig. 3.

Witnesses
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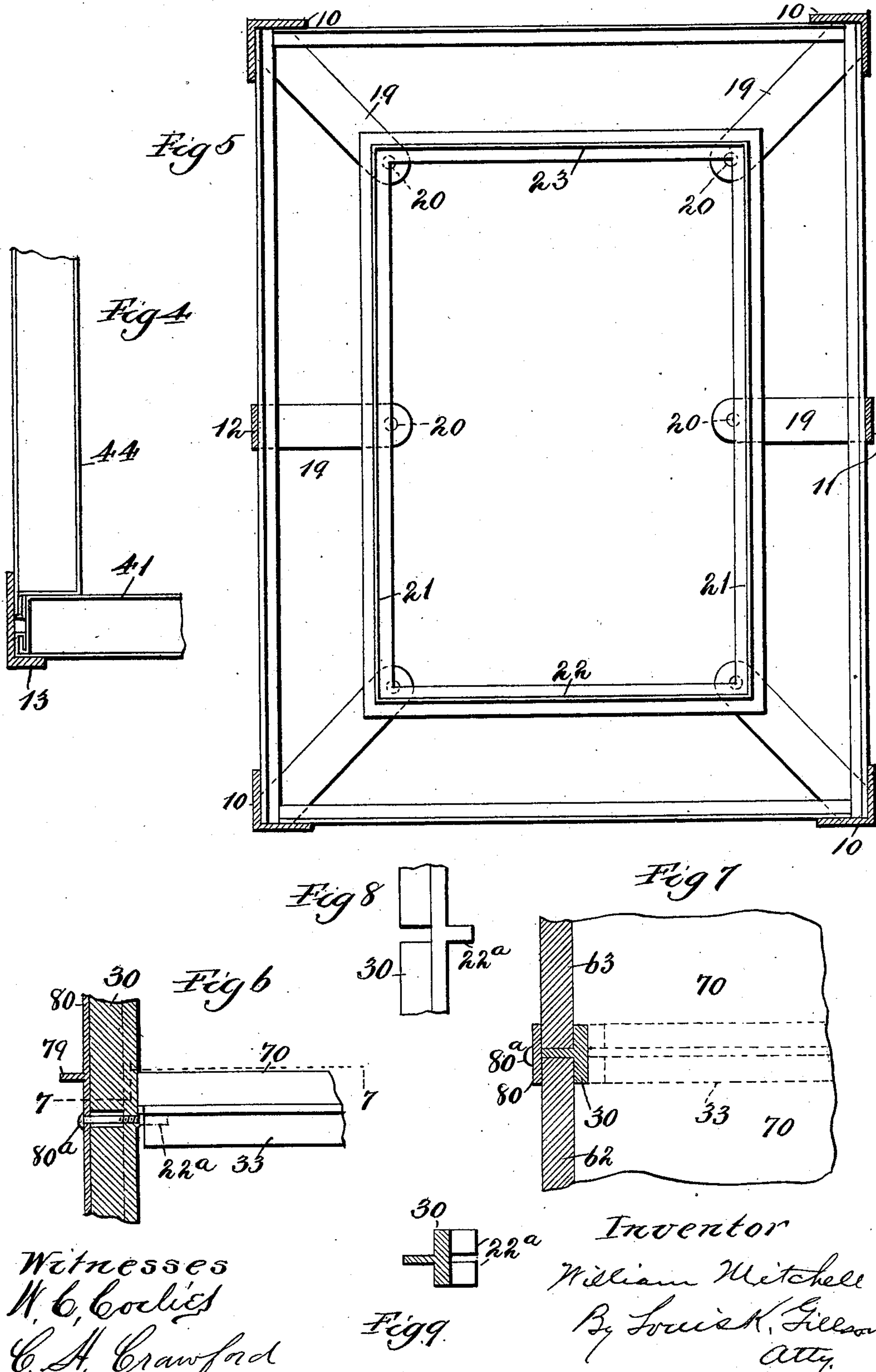
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4 Sheets—Sheet 4.

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PORTABLE BAKE OVEN.

No. 582,362.

Patented May 11, 1897.



UNITED STATES PATENT OFFICE.

WILLIAM MITCHELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN I. MARSHALL AND WILLIAM P. KENNARD, OF SAME PLACE.

PORTABLE BAKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 582,362, dated May 11, 1897.

Application filed December 19, 1896. Serial No. 616,293. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MITCHELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Portable Bake-Ovens; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

The invention relates to that class of portable bake-ovens which are made in sections, so that they may be taken down for transportation and rebuilt; and its object is to secure such an interlocking and interfitting of the several parts which enter into the construction of the oven that it may be easily transported and may be set up by any ordinary mechanic without requiring the attendance of one specially skilled in oven-building.

It has for further objects economy of construction, efficiency in action, and durability.

The invention consists in two separate frames, the one located within the other and both being directly supported from the floor, together with suitable sections for forming the walls of an outer casing in conjunction with the outer frame and the oven itself in conjunction with the inner frame.

It consists, further, in the peculiar arrangement of the draft-flue shown and in further minor details of construction, as hereinafter fully pointed out.

In the drawings, Figure 1 is a central vertical longitudinal section of the oven. Fig. 2 is a plan section on the line 2 2 of Fig. 1. Fig. 3 is a transverse vertical section on the line 3 3 of Fig. 1. Fig. 4 is a detail vertical section of one of the corners of the outer casing. Fig. 5 is a plan section of the two frames, taken on the line 5 5 of Fig. 1. Fig. 6 is a detail sectional view on the line 6 6 of Fig. 1. Fig. 7 is a sectional view on the line 7 7 of Fig. 6. Fig. 8 is a detail elevation of one of the parts. Fig. 9 is a detail section on the line 7 7 of Fig. 6 of a part of the inner frame.

The outer casing of the oven is supported upon four corner legs, designated by the

numeral 10 and being preferably of angle-iron. These legs may be continued integrally upwardly to the top of the oven to form the corners of the casing. At the sides of the oven additional supporting-legs 11 12 may be provided, and these also are continued upwardly to the top of the casing, preferably integrally, and are in T form. The corner-supports 10 are united by means of angle-iron sills, those upon the sides being indicated at 13 13, the front sill being marked 14 and the rearward sill 15. These sills are supported upon brackets 19, securely bolted to the upright supports. The upper ends of the uprights 10 11 12 are united by means of angle-iron T-beams, those at the sides of the casing being marked 16, the front one 17, and the rear one 18. The lower sills 13, 14, and 15 have their angles directed inwardly and upwardly, and the upper tie-beams 16, 17, and 18 have their angles directed inwardly and downwardly. The brackets 19 are continued inwardly, those at the corners entering diagonally and those secured to the uprights 11 12 being in perpendicular relation to the sills 13 13, and each of these brackets is provided at its inner end with a foot 20, adapted to rest upon the floor and to support the inner casing, which constitutes the body of the oven proper.

The frame of the oven consists of the side sills 21 21, the front sill 22, and the rear sill 23, all of which are T-beams having their stems projecting upwardly, the uprights 24 25 at each corner of the frame, one member of each pair being at the outer side of the frame and the other member at the inner side thereof, these uprights being angle-irons having their angles directed inwardly, and the tie-beams 27 at the sides, 28 at the front, and 29 at the rear connecting the upper ends of the uprights and being in the form of angle-irons having their angles directed upwardly and inwardly. The members of each pair of uprights 24 25 are secured together by stay-bolts 26. At the sides of this frame are placed two pairs of upright T-beams 30 31, the stems of which project outwardly, each of which is provided with a pair of inwardly-projecting vertically-slotted brackets 22^a 23^a, upon which rest cross-beams 33 34 in

T form, and at corresponding elevations cross-beams 32 35, in angle form, are secured, respectively, to the uprights 25 at the front and at the rear of the frame. Cross-beams 5 36 37, having their stems directed upwardly, are supported by the tie-beams 27 27.

The function of the cross-beams 32, 33, 34, 35, 36, and 37 is to carry the oven-shelves and their covering, and they will be of greater 10 or less number according to the number of shelves employed and the size of the tile sections, hereinafter described, which may be used.

The bottoms of the outer casing and of the 15 oven are upon the same level and are composed of hollow sheet-metal cases, those forming the floor of the outer casing being shown at 38, 39, 40, and 41, and are supported by the sills 13, 14, 21, 22, and 23.

The sections of the floor of the oven are 20 shown at 55, 56, 57, and 58, the first two extending entirely across the oven and being supported by the sills 21 21 and the last two flanking the heating-chamber of the furnace 25 61, so as to leave a space for the circulation of air from the furnace-chamber to the oven, and are supported by the sills 21 22 and the sides 59 60 of the furnace-casing.

The sides and top of the outer casing are 30 inclosed by means of similar sections. As shown, the rear wall comprises but a single section 46, resting upon the floor-section 39 and held in place by the upright corner-pieces 10, the sill 15, and the tie-beam 18. The side 35 walls are shown as each comprising two sections, designated in the drawings as 42, 43, 44, and 45, and which rest upon the floor-sections 40 41 and are held in place by the sills 13 13 and the tie-beams 16 16, as well as by 40 the upright corners. The front of the casing is shown as consisting of four sections 47, 48, 49, and 50, arranged to inclose the casing 51 of the oven-door 51^b and being held in place by the front members of the frame. The top 45 of the outer casing is shown as consisting of three sections 52, 53, and 54, which rest in the angles of the tie-beams 16, 17, and 18.

These several sections of the walls of the outer casing are formed with folded seams so dis- 50 posed that the sections conveniently interlock, and these seams assist in holding them in place, as I have clearly shown in Fig. 4, wherein the seam or joint of section 41 is shown as abutting against the upright flange 55 of the sill 13 and being at the lower angle of the section, so as to provide above it a space for accommodating the joint of section 41, which is so formed as to project from the edge of the section to enter this space, thereby locking 60 the section 44 against displacement inwardly and obviating the necessity for using rivets or other devices for securing the walls in place. The joints of the outer casing may be made air-tight by the use of cement, and 65 the several sections of its walls, floor, and top

are preferably filled with a non-conducting material, such as mineral wool.

The oven proper is inclosed by the use of tiling, preferably of fire-clay, fitted between and supported by the several members of the 70 oven-frame. The side walls are shown as being composed of tile-sections 62, four in number, fitted at one of their edges between the upright corner-pieces 24 25 and at their other edges resting within the angles of the uprights 75 30 31. The middle section of each side (designated in the drawings 63) fits within the angles of the uprights 30 31, and a stay-plate 80 is secured to the outer end of the stem part of each of the T-beams 30 31 by means of the 80 screw-bolts 80^a, so as to hold the tile-sections 62 63 in place.

The top of the oven is covered by tile-sections 71, being shown as three in number and extending entirely across the oven, resting 85 upon the tie-beams 27 28 29 and upon the cross-beams 36 37. The front and rear of the oven are closed by the tile-sections 64, 65, 67, and 68, fitted between the uprights 24 25, those at the rear being stayed at their inner edges 90 by means of an upright in T form 66 and those at the front abutting against the oven-door casing, which is supported in part by an upright in T form shown at 51^a.

The oven-shelves are formed of the tile-sections 69 70, three being used for each shelf, 95 and which rest upon the cross-beams 32, 33, 34, and 35. The ends of the tile-sections 69 and 70 are spaced apart from the side walls, as shown in Fig. 2, thereby providing for the 100 circulation of air from the heating-chamber of the furnace. A cooling-damper 72 is located at the back of the oven and is controlled by means of a pull-rod 73, extending through the front of the oven-casing and connected 105 with the damper by means of a link-bar 74 and a bell-crank 74^a.

The furnace 61 may be of any preferred construction, having a firing-door 61^a and an ash-pit door 61^b and being inclosed within a 110 casing whose walls are shown at 59, 60, and 60^a. The smoke-flue 75 leads from the furnace through the hot-air chamber below the lower shelf of the oven to the flue-space 76 between the rear wall of the oven and the rear 115 wall of the outer casing. This flue-space 76 is limited to the lower portion of the space between the oven and the casing by the interposition of a plate 78, secured to the oven-frame and resting upon brackets 79, attached 120 to the uprights 24 and to the tie-plates 80 and extending to the walls of the outer casing. The plate 78 terminates at the front of the oven, leaving a space between its end and the casing 51 of the oven-door for the passage of 125 the smoke to the chamber between the upper part of the oven and the outer casing. A discharge-flue 81 for the smoke is shown as passing through the rearward section 54 of the covering of the outer casing. By this flue 130

arrangement it will be seen that the smoke is carried by means of the flue 75 directly through the hot-air chamber at the bottom of the oven and then circulates entirely around the oven, being carried first along that portion of the oven-walls which incloses its hot-air chamber, ascending at the extreme front of the oven. I have found by long experience that the practical difficulty in oven construction is to restrict the heated vapors to the lower portion of the structure, and particularly to bring them to the front of the oven. The natural tendency of the heated vapors to rise causes great loss of heat when it is attempted to employ flues each of which is of any considerable vertical width, the hot vapors taking the most direct course to the discharge-aperture of such a flue and unduly heating the top of the oven. By the arrangement shown I provide for the effective heating of the front wall of the oven, but rely mainly upon the circulation through it of the hot air. In order to prevent the undue heating of the lower shelf immediately above the flue 75, I locate a baffle-plate 82 above this flue.

The several sections of the frames of the oven and the outer casing may be secured together by the use of screw-threaded bolts, and for transportation these may be readily separated. The framework having been put in place, the tiling of the oven may be introduced and the several sections of the walls of the outer casing fit together and interlock, so that no riveting or bolting is necessary. The sections 55, 56, 57, and 58, however, composing the bottom of the oven, support no weight but their own and rest in the angles of the sills of the oven-frame in such manner that they may be easily removed from below should it become necessary to gain access to the interior of the oven for the purpose of cleaning it.

By the construction shown I am able also to reduce the length of the cross-beams which support the oven-shelves and which are subjected to the most intense heat employed, confining them entirely to the interior of the oven, so that the smoke does not circulate around them. I find this to be a great advantage in oven construction, for the reason that these cross-beams are very apt to bend under the great weight which they necessarily support when they are subjected to the intense heat of the smoke. For the same reason it is a decided advantage to construct and support the frame of the oven independently of the frame of the inclosing casing, and this construction is secured in the oven herein

described, the bracket-pieces 19 serving only to lock the two frames together against horizontal displacement.

I claim as my invention—

1. In a bake-oven the combination with an outer shell, of a casing within the shell and inclosing the baking-chamber, such inner casing being supported independently of the outer shell.

2. In a bake-oven the combination with a casing inclosing the baking-chamber, and a shell inclosing the casing and spaced apart therefrom to form flue-chambers therewith, of standards for directly supporting the casing and shell independently each of the other.

3. In a portable bake-oven the combination with a rigid skeleton frame, of wall-sections adapted to fit and interlock between the members of the frame, whereby a substantially air-tight casing is formed.

4. In a portable bake-oven the combination with two independent rigid frames, one within the other, of wall-sections adapted to fit between the members of each frame and to interlock therewith and with each other.

5. In a bake-oven the combination with an inner casing for inclosing the baking-chamber and an outer shell, whereby a flue-space is formed between the casing and shell, of a substantially horizontal partition dividing such flue-space into two flue-chambers and being apertured at the front of the oven for the passage of smoke from the lower to the upper chamber, and a furnace having a smoke-flue discharging into such lower flue-chamber.

6. In a portable bake-oven the combination with a rectangular frame, comprising sills having inwardly and outwardly directed angles, a pair of right-angle uprights at each corner spaced apart and having their angles directed inwardly, right-angled tie-beams uniting the corners, and having their angles directed upwardly and inwardly, upright T-bars extending from the sills to the tie-beams, intermediate of the corners, and having their flat faces directed inwardly, tile-sections set in the angles of the sills and T-bars, and between the two members of the corner-uprights, and tie-plates bolted to the outer edge of the T-bars to secure the tile-sections, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM MITCHELL.

Witnesses:

LOUIS K. GILLSON,
ISABEL A. HELMICH.