L. R. HOLBROOK.

OVEN.

APPLICATION FILED DEC. 24, 1909.

970,501. **Patented Sept. 20, 1910.**

5 SHEETS—SHEET 1.

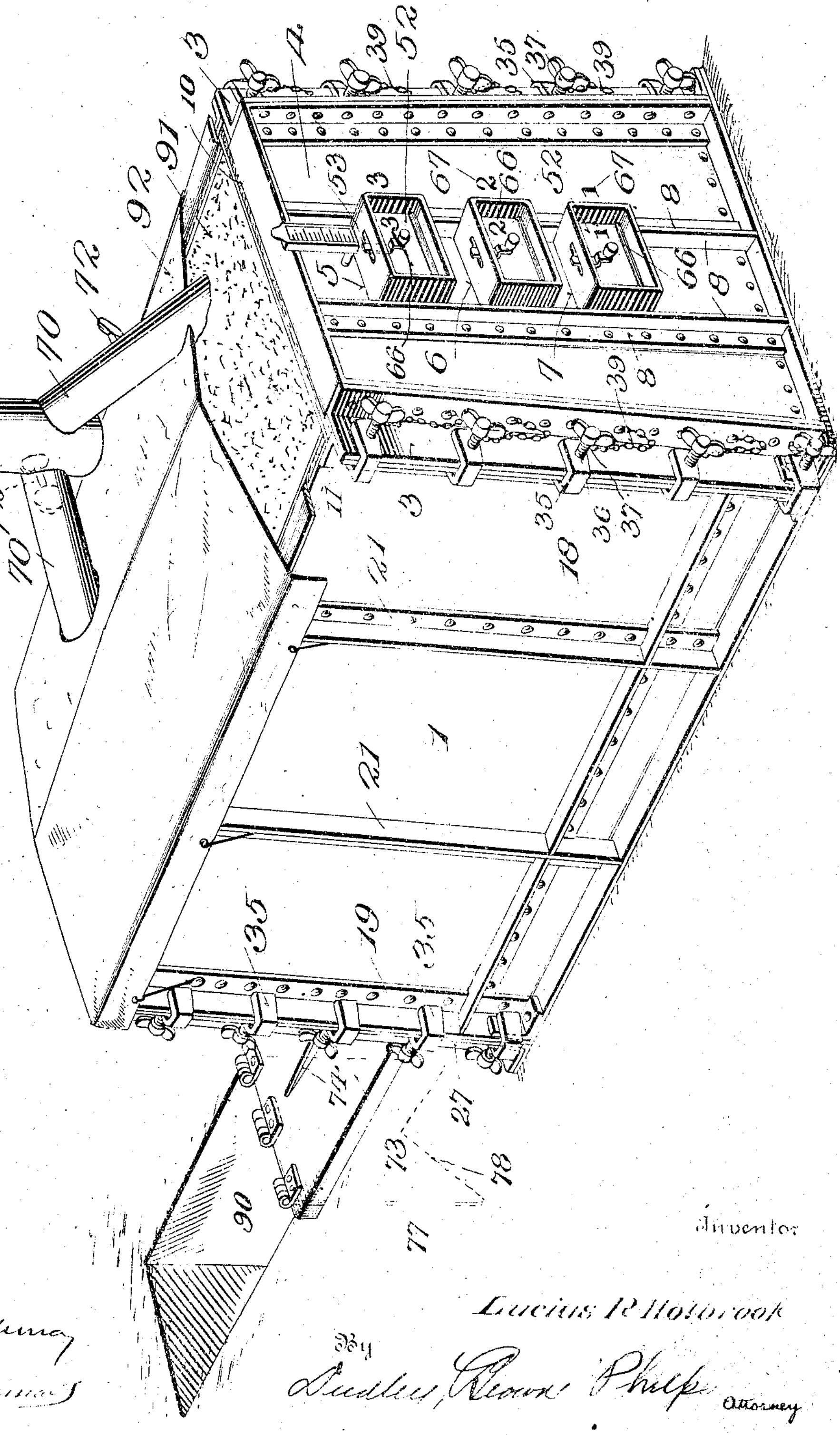

FIG. 1.

Witnesses

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5 SHEETS—SHEET 2.

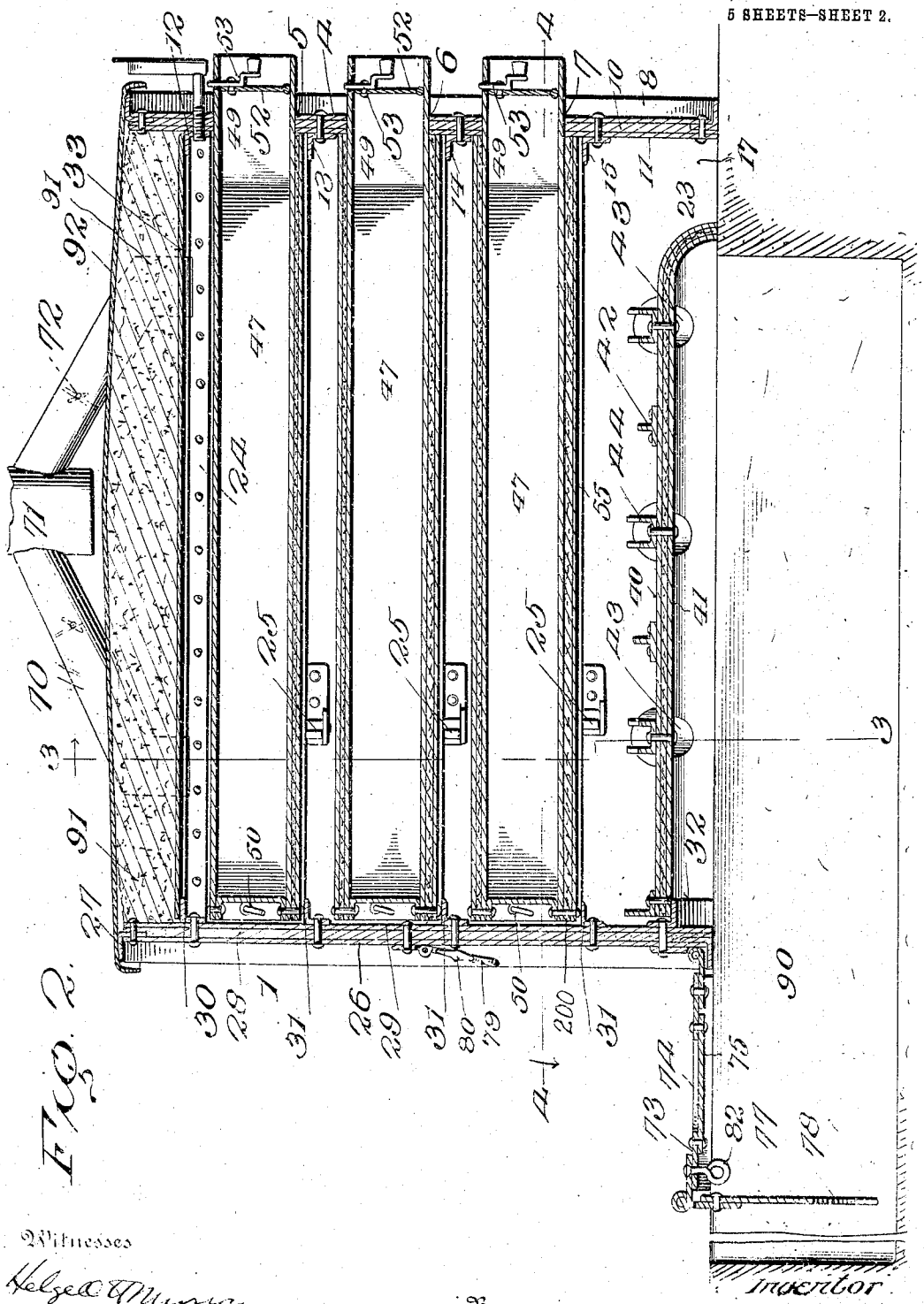

FIG. 2.

Witnesses

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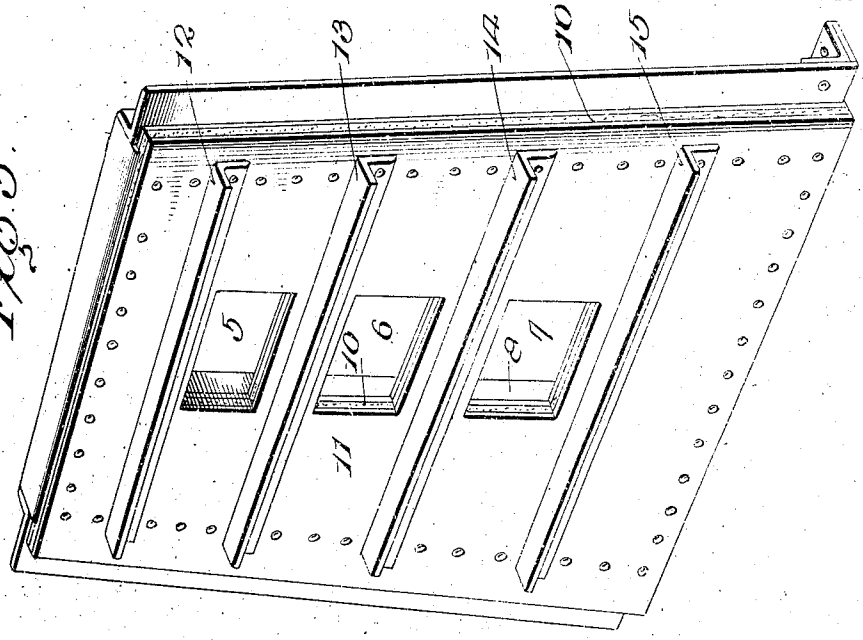
5 SHEETS—SHEET 3.

FIG. 5.



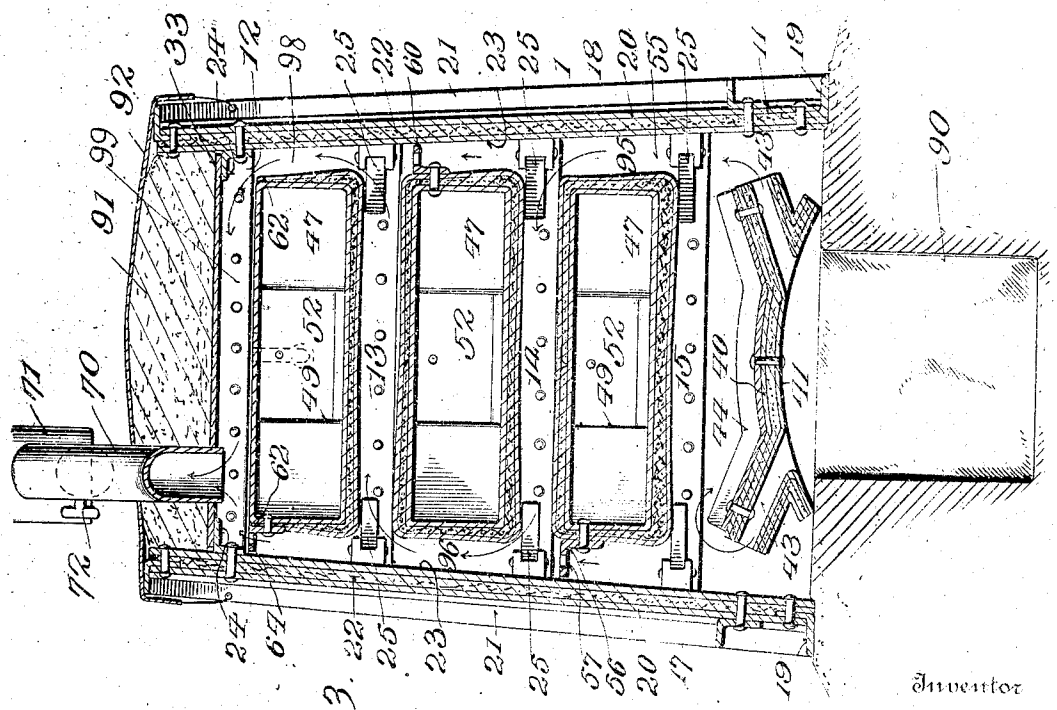


FIG. 3.

Witnesses

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5 SHEETS—SHEET 4.

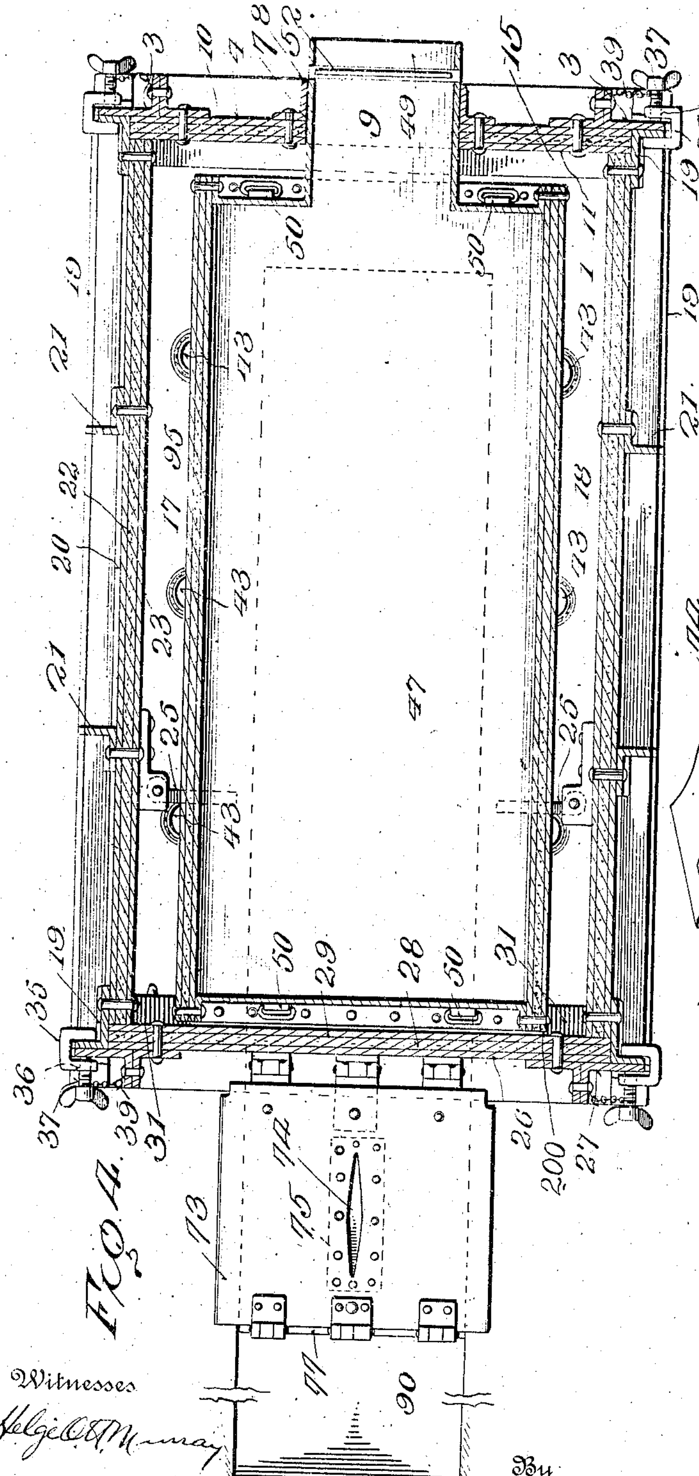

FIG. 4.

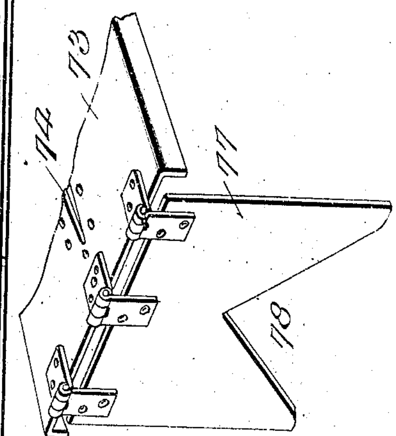

FIG. 6.

Witnesses

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970,501.

Patented Sept. 20, 1910.

5 SHEETS—SHEET 5.

Fig. 8.

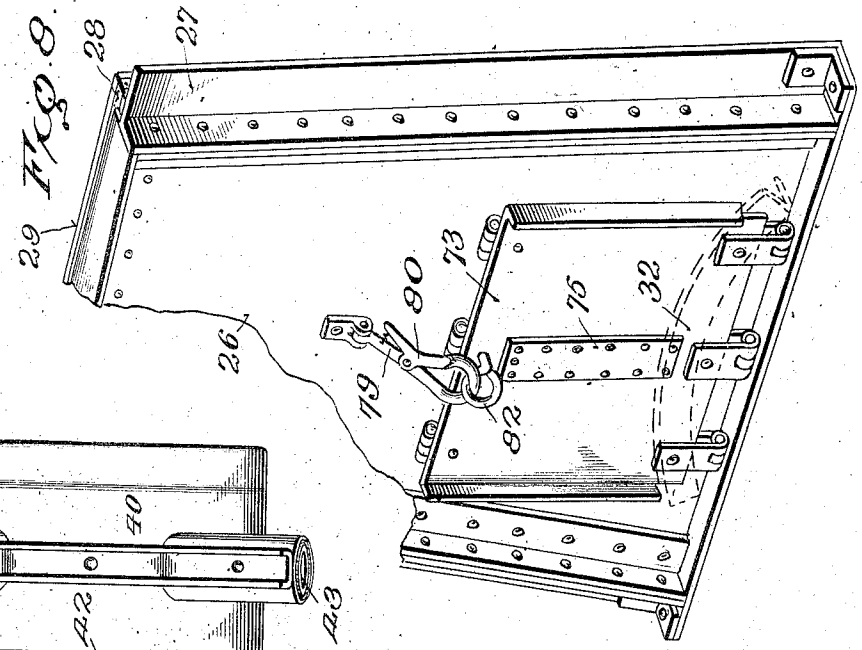


Fig. 11.

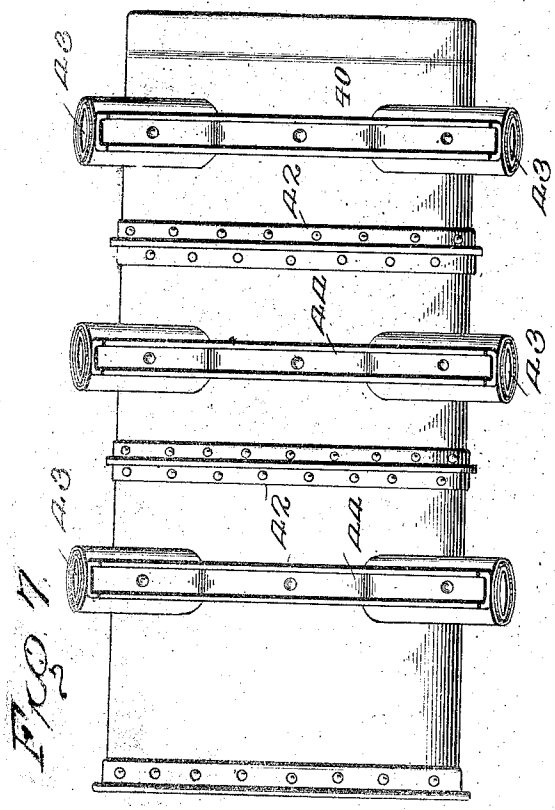
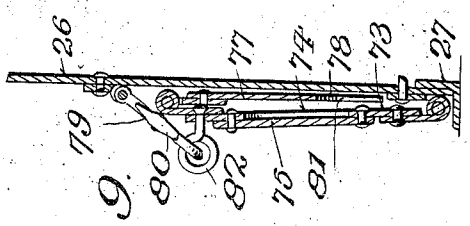


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

LUCIUS R. HOLBROOK, OF FORT RILEY, KANSAS, ASSIGNOR OF ONE-HALF TO PATRICK DUNNE, OF FORT RILEY, KANSAS.

OVEN.

970,501. Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed December 24, 1909. Serial No. 534,810.

To all whom it may concern:

Be it known that I, LUCIUS R. HOLBROOK, a citizen of the United States, residing at Fort Riley, in the county of Geary and State of Kansas, have invented certain new and useful Improvements in Ovens, of which the following is a specification.

This invention relates to improvements in portable ovens for field service.

The prime object of the invention is to provide a structure, so constructed, that it can be quickly and conveniently assembled or knocked down and arranged in compact form for transportation or storage purposes.

It is of the utmost importance in an oven of this character, when used for army service especially, that the details of construction be such as will withstand the hard usage, and the inexperience of those handling it.

To this end the invention comprehends improvements in the construction and arrangement of the parts, and at the same time being so simple as will enable one with ordinary intelligence to assemble it, or knock it down, without liability of breakage.

According to this invention, I provide the baking chambers with open reduced ends or necks, which protrude through the casing to obtain a substantial support, and also provide the casing with other supports, on which the front and rear of said chambers rest when in use. Temporary supports are also provided for holding the baking chambers while placing the rear section of the casing carrying the rear supports in position. These supports are hinged on the inside of the casing, and they may be folded when the casing is packed for transportation.

My invention also relates to the manner of constructing the casing sections, whereby their ends may be so correlated when assembled as will permit of the employment of clips to quickly bind the parts together, and thereby prevent them falling when the oven is in use.

As it is primarily intended in the use of my oven to set up the parts directly on the ground, over a pit previously dug in the earth, it is important that the cover for said pit be specially constructed to resist the intense heat, and at the same time properly and equally spread the products of combustion in the various flues.

Therefore this invention relates to improvements in the cover for the fire pit, the same comprising two spaced curved plates with interposed asbestos, and outwardly extending flues to direct the products of combustion toward the inner sides of the casing.

This invention also relates to the specific details of construction of the baking chambers.

In addition to the oven being used for baking, I have arranged a folding auxiliary cover for the fire pit which extends outside the casing, and which may be utilized as a shelf or support for holding pots or kettles for boiling purposes.

The arrangement of parts and the specific details of construction will be hereinafter described and particularly pointed out in the claims.

In the drawings: Figure 1 is a perspective view, Fig. 2 is a longitudinal section; Fig. 3 is a transverse section; Fig. 4 is a horizontal section; Fig. 5 is a detail perspective view looking from the inside of the front section of the casing; Fig. 6 is a detail view of the auxiliary cover and the fire shield; Fig. 7 is a plan view of the cover for the fire pit; Fig. 8 is a detail perspective view of the rear section of the casing; Fig. 9 is a detail section of the rear section of the casing and the auxiliary door and shield folded thereon.

The casing 1, is formed of a series of sections, each having peculiar characteristics, which will make it necessary to describe them separately.

The front section is composed of a frame made of angle irons 3, having secured thereto an outer sheet of iron 4, formed with preferably three openings 5, 6 and 7. Braces 8 extend between the upper and lower angle irons 3, and are secured to the outer sheet of iron 4, adjacent the openings 5, 6 and 7. Over the rear face of the sheet iron 4, is a layer of asbestos 10, and over its face is an inner sheet of iron 11. Bolts, rivets, or other fastening means are employed to securely hold the inner and outer sheets of iron and interposed layer of asbestos together. Near the top of the inner face of the front section is a horizontal bar 12. Spaced from this bar 12, and below the same are three similar transverse bars 13, 14 and 15, located adjacent the lower walls of the openings 5, 6 and 7.

The two side sections 17 and 18, are similarly constructed, and a description of one will be sufficient for both. Each side section is composed of a frame 19 formed of angle iron, an outer sheet of metal 20 riveted thereto, and interposed braces 21. On the inner face of the sheet of metal 20, is a layer of asbestos 22, on the inner face of which is a sheet of metal 23, the two sheets of metal and the interposed layer of asbestos are bolted or otherwise fastened together, as clearly shown in the drawing. Near the top of the side section is a horizontally disposed bar 24. Below the bar are three hinged lugs, 25, which are approximately in alinement with the three horizontal bars, 13, 14, and 15 on the front section.

The rear section 26 comprises a frame 27, formed of angle iron, with a sheet of metal riveted thereto. On the inner face of the metal sheet is a layer of asbestos, 28, protected by a second metal sheet, 29, the metal and asbestos being securely riveted together. Near the top of the inner face of the rear section 26, is a horizontal bar, 30, and spaced therefrom, and below the same are three similar horizontal bars 31. Below these bars and near the bottom of the section 26, is a curved bar, or support, 32.

The horizontal bars, 12, 24, and 30, of the front, rear and side sections are all in the same plane and form a support for the top, 33. The three horizontal bars, 13, 14, and 15, are in alinement with the similar bars 31 on the rear section and serve as supports for the three baking chambers, and the bar 32 forms a means for locating one end of the cover for the fire pit, to be later referred to, and also forms a joint between said cover and the rear section.

The frames of the sections as stated, are formed of angle irons, and are so positioned that the abutting flanges extend outwardly in the same direction, as best seen in Fig. 4. The object of so arranging the angle irons is, that it enables me to use a simple and inexpensive means for quickly and conveniently locking the sections together. There are a number of these locking devices for the abutting corners of the sections, the number depending on the size of the oven.

Each locking device consists of a substantially U shape clip, 35, one leg of which is formed with a threaded opening 36, for a threaded bolt 37, having a finger piece at its end. Attached to either the clip or the bolt is a chain 39, the opposite end of which is attached to one of the respective casing sections.

The fire pit cover is curved in cross section, and rests at one end on the curved bar, 32, on the rear section, and is less in width than the distance between the two side sections. The cover comprises two sheets of metal 40 and 41, and an interposed layer of asbestos, and transversely arranged braces, 42. Extending outwardly from each side of the arch, formed by the cross sectional curvature of the cover, are flues, 43, which terminate short of the side sections 17 and 18. These flues like the cover, are formed of two thicknesses of metal with asbestos interposed therebetween, and to strengthen them, they are provided with braces, 44.

Each baking chamber consists of a metal casing 47, with a reduced neck or extension 49, of such size as will pass through one of the openings 5, 6 and 7, and at the ends are handles 50. The necks are open in front, and afford the only means for gaining access to the baking chambers, and the only means for the escape of the vapor arising from the baking bread or the like. Within the open end of the neck is a hinged door 52, provided with a latch 53, to securely lock it when baking.

The bottom baking chamber 47, is provided with a layer of asbestos, which gradually increases in thickness from the bottom toward the lower corners. The layer of asbestos gradually decreases in thickness toward the upper corners, from which it becomes thinner toward the middle of the top, as shown in Fig. 3. It will be observed the thickness of asbestos at the upper corners is less than at the lower corners, and is thinner at the middle of the top, than at the corresponding point at the bottom. The purpose in so distributing the asbestos on the lower baking chamber, is to resist the destructive influence of the products of combustion, due to the fact that the chamber is in proximity to the point where the most intense heat is generated. To protect the asbestos, and at the same time to hold it in position on the baking chamber, it is covered with metal 55. Extending outwardly from one upper corner of the lower baking chamber and fitting against the side section 17, is a baffle plate 56, formed with openings 57, for the passage of a part of the rising gases. The second or intermediate baking chamber is constructed substantially like the lower one, except that the layer of asbestos is thinner, as it is a greater distance from the fire pit, and the heat is not so intense and therefore not so destructive to the metal.

Extending from one of the upper corners of the intermediate baking chamber, and contacting with the casing is a baffle plate 60, provided with openings for the passage of the products of combustion. This baffle plate is on the side opposite to that of the baffle plate of the lower baking chamber, to cause the escaping gases to pass around the various chambers.

The uppermost baking chamber is substantially the same as the others, except that, because of it being at such a remote dis-

tance from the fire pit, the layer of asbestos is greatly reduced. The layer of asbestos on this baking chamber does not extend entirely around the same, but terminates at points near the top corners as indicated at 62. Furthermore, the layer is not so thick as in the case of the two preceding chambers described, as clearly indicated in Fig. 3. To one of the upper corners of this baking chamber, is attached a baffle plate 64, which extends to the casing and is formed with openings for the passage of the gases. This baffle plate is on the same side as the baffle plate on the lowermost chamber to cause the gases to take a circuitous route to the exit flue.

In order that the baking chambers may be assembled in their proper positions, when setting up the oven, they are each provided with indicating characters 66, and similar characters 67, are noted on the front section adjacent the openings therein. With little care these characters will enable an attendant to properly locate a particular chamber constructed to resist the heat at a particular point in the casing, and thereby reduce to a minimum the liability of misplacing them.

From the top section lead the two members 70 of a fork shape exit flue 71, each member having a damper 72, to control the exit of the products of combustion.

Hinged to the rear section 26, is an auxiliary cover 73, for the fire pit, and it is provided with a longitudinal slit 74, which is covered on the bottom with a thin metal plate 75. The function of the slit is to compensate for warping when the fire is made in the fire pit. The hinged door 73, is designed to serve as a shelf, or support for pots or kettles.

Hinged to the auxiliary cover is a shield 77 which fits down in the fire pit and serves as a door for the latter. The end of the shield is cut away at 78 to provide an opening for the admission of draft to the fire.

When transporting or storing the apparatus, it is desirable and convenient to fold the auxiliary cover and shield close to the rear section of the casing. To hold the parts in this position, a latch 79, is pivoted to the rear section, and at its hooked end is provided with a pivoted catch 80. To the underside of the shield 73, is secured a staple 82, with which the hooked end of the latch engages when the parts are folded, as best seen in Fig. 9.

When assembling the apparatus, a pit 90 is dug in the earth, and the front section is placed in a vertical position across the pit, and the side sections are similarly positioned, lengthwise of and outside the walls of the pit, and the clips 35 are slipped over the abutting corners of the angle irons of the frames of the front and side sections, and the bolts are tightened to securely hold the said sections together. The sides and front sections having been assembled, the fire pit cover is placed in position over the pit, the same resting at its rear end on the curved cross bar and the remaining edges being supported on the earth adjacent the pit. Then the lower baking chamber is put in place, that is its reduced neck 49 is fitted in the opening 7 in the front section and is supported by the horizontal cross bar 15, and the lowermost hinged side lugs are turned toward each other, and temporarily support the rear of the chamber, until the others have been positioned and the rear section been positioned. The two remaining baking chambers are similarly positioned and supported in the casing on the respective cross bars and hinged lugs, until the rear section is placed in vertical position abutting against the ends of the side sections. The corners of the frames of the side and rear sections are secured together by the clips, and the rear ends of the respective chambers are supported on the rear horizontal cross bars 31. The top is now placed within the upper part of the assembled casing sections, and is supported on the upper bars 12, 24 and 30 arranged for this purpose. A layer of dirt indicated at 91 is spread on the top to retain the heat within the casing as much as possible, and to still further confine the heat, and to protect the oven from inclement weather a flexible protecting cover of water proof canvas, is thrown over the entire top, and is provided with ropes to fasten it to the casing. The auxiliary door 73, and shield 77 are released from the latch 80 and a fire is started in the fire pit. By reason of the fact that the front and rear sections of the casing taper somewhat toward the top, and the baking chambers are of substantially the same width, the passages or flues formed between said chambers and casing are of tapered formation. When the heat is of less temperature, the restricted exit will serve to retard the escaping products of combustion, and thereby equalize the heat at this point, resulting in all three chambers maintaining approximately a uniform temperature. When the fire is started, the products of combustion pass through the outwardly extended flues into the space or passage formed between the lowermost chamber and the fire pit cover, and are deflected by the baffle plate 56 to the narrow passage 95 formed between the opposite side of the chamber and the casing, and by the baffle plate 60, the gases are directed between the two lower chambers and through the narrow passageway 96 formed between the intermediate chamber and the casing. The products of combustion are then deflected by the baffle plate 64 through the space between the top and intermediate chambers, through the

space 98 to the passage 99 formed by the top and the top chamber to the exit flue. While the baffle plates 56, 60, and 64 direct the escaping gases through the tortuous passage described, a portion of the gases will take a more direct course to the exit flue through the openings in said baffles. It is of course evident a portion of the products of combustion will pass through the slight spaces indicated at 200, in Figs. 2 and 4, and formed between the front and rear ends of the chambers and the front and rear sections of the casing, so that the whole outer surface within the casing is subjected to the heated gases. As the chambers are closed, the vapor from the dough during the baking period is confined, which adds greatly to enhance the grade of the bread.

The invention as described is simple and comparatively inexpensive, and may be quickly and conveniently assembled or knocked down. Furthermore by constructing the parts as described, the heat is effectually retained in the casing, and by employing a pit for the fire and utilizing a cover to straddle the same, considerable expense and time is saved in the manufacture and assembling of parts.

What I claim is:

1. A portable oven comprising a casing composed of a series of sections, one of said sections having a plurality of openings, detachable clips for securing the sections together at the abutting corners, an exit flue at the upper end of the casing, a series of baking chambers in the casing and spaced from the side walls thereof to form passages for the exit of the products of combustion, the baking chambers having reduced extensions extending through the openings in the casing, a door in each reduced extension, supporting bars on the front and rear sections of the casing to support the baking chambers, a cover plate for a fire pit formed in the earth under the casing, the casing and cover plate being adapted to be independently supported by the earth at the sides of the fire pit, and flues in the cover plate for the exit of the products of combustion to the passages.

2. A portable oven comprising a casing composed of a series of sections, one of which is formed with openings, an exit flue at the upper end of the casing, a series of baking chambers in the casing and spaced from the sides of the latter to form an exit passage for the escaping products of combustion, the baking chambers having extensions which protrude through the openings in the casing, a door for each extension, bars on the front and rear sections of the casing to support the baking chambers, a baffle plate located between each baking chamber and the casing, the baffle plates being disposed on the opposite side of each successive baking chamber to provide a circuitous path in the exit passage for the products of combustion, each baking chamber having a layer of heat resisting material, the layer of heat resisting material decreasing in proportion on each baking chamber from the bottom toward the top, a cover plate for a fire pit formed in the earth below the casing, the casing and cover plate being adapted to be independently supported by the earth at the sides of the fire pit, and flues in the cover plate for the exit of the products of combustion into the exit passage.

3. A portable oven comprising a casing composed of sections, a plurality of removable baking chambers in the casing, and spaced from the latter to form a passage for the products of combustion, bars on the inside of the casing to support the baking chambers, a cover plate to fit over a fire pit dug under the casing, said cover plate and casing adapted to be independently supported by the earth adjacent said pit, and flues in the cover plate for the exit of the products of combustion to the passage.

4. A portable oven comprising a casing composed of sections having outwardly extending flanges at the abutting corners, detachable clips engaging the outwardly extending flanges to secure the sections together, a series of baking chambers supported in the casing and spaced from the same, a baffle plate extending from each baking chamber toward the casing to provide a circuitous passage for the products of combustion, a cover plate to fit over a fire pit dug in the earth under the casing, the casing and cover plate being adapted to be independently supported by the earth at the sides of the fire pit, flues extending from the cover plate for the exit of the products of combustion to the circuitous passageway, and an exit flue at the upper end of the casing.

5. A portable oven comprising a casing adapted to be supported on the earth around a fire pit, and made in sections, each section comprising a frame of angle iron and two sheets of metal with an interposed layer of heat resisting material, one of said sections having openings, substantially U shape clips and bolts for engaging the angle irons at the abutting corners of the sections to secure the latter together, supporting bars on the inside of the sections below the top edges of the latter, a top section supported on said bars, heat resisting material on the top, a water proof covering over the latter heat resisting material, removable baking chambers having reduced extensions, the extensions protruding through the openings in the section, said baking chambers being spaced from the casing to form an exit passage, bars on the front and rear sections for supporting the baking chambers, a cover plate

to fit over a fire pit dug in the earth under the casing, the edges of the cover plate resting on the earth each side the pit and supported independently of the casing, flues extending from the cover plate and communicating with the exit passage, and an exit flue at the upper end of the casing.

6. An oven comprising a casing which rests upon the ground over a fire pit, said casing having openings, baking chambers supported in the casing, and spaced from the walls of the latter to form an exit passage, each chamber having a reduced extension which protrudes through the openings in the casing, baffle plates, located between the baking chambers and the casing to form a circuitous passage for the escaping gases, a cover plate extending over the fire pit, said cover plate adapted to be supported by the earth, adjacent said pit, independently of the casing, flues extending from the cover plate and into the circuitous passage, and an exit flue at the upper end of the casing.

7. An oven comprising a casing which rests upon the ground over a fire pit, said casing having openings, baking chambers supported in the casing and spaced from the walls to form an exit passage the end of said chambers protruding through the openings in the casing, baffle plates extending between the baking chambers and the casing to form a circuitous passage for the escaping gases, an arch shape cover plate extending over the fire pit which rests upon the upper walls of earth adjacent said pit, and adapted to be supported independently of the casing, said cover plate being of less width than the interior width of the casing, flues extending from the cover plate and terminating short of the walls of the casing for the exit of the gases from the fire pit, and an exit flue at the upper end of the casing.

8. A portable oven comprising a casing formed with openings, cross bars mounted on the inside of the casing, a series of baking chambers having reduced extensions which pass through the openings in the casing, said chambers being of less width than the interior of the casing to form an exit passage and supported on the cross bars, a plurality of hinged supports on the inside of the casing to temporarily hold the baking chambers when assembling the casing, a cover plate fitting over a fire pit dug in the earth under the casing, the casing and cover plate being adapted to be independently supported by the earth at the sides of the fire pit, flues extending from the cover plate and into the exit passage for the escape of the products of combustion, and an exit flue at the upper part of the casing.

9. A portable oven comprising a casing composed of sections having outwardly extended flanges at the abutting corners, and adapted to be supported by the earth around a fire pit detachable clips engaging the outwardly extended flanges to secure the sections together, one of said sections having openings, baking chambers supported in the casing and spaced from the walls of the latter to form an exit passage, the chambers having reduced extensions which protrude through the openings, handles on the baking chambers, hinged supports on the inside of the casing to temporarily support the baking chambers when assembling the casing, a cover plate for a fire pit dug under the casing said cover plate resting on the walls of the earth adjacent the fire pit; flues extending from the cover plate to permit the products of combustion to pass into the casing, baffle plates for directing the products of combustion around the baking chambers, and an exit flue near the top of the casing.

10. In a portable oven, the combination of a casing comprised of sections, one of which is provided with openings, a plurality of removable baking chambers mounted in the casing each baking chamber being of less width than the interior of the casing to form exit passages for the products of combustion, each baking chamber having a reduced extension which protrudes through one of the openings, means in the casing for supporting the removable baking chambers, baffle plates arranged in the passages to direct the products of combustion around the baking chambers, detachable clips for securing the sections together, a cover plate for a fire pit dug in the earth under the casing the casing and cover plate being adapted to be independently supported by the earth at the sides of the fire pit, flues extending from the cover plate and into the exit passages, and an exit flue at the upper part of the casing.

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

LUCIUS R. HOLBROOK.

Witnesses:
ELLIS R. BOWMAN,
ALFRED J. MAXWELL.