G. E. PICKUP.

COLLAPSIBLE STOVE.

APPLICATION FILED DEC. 19, 1914.

1,187,009.

Patented June 13, 1916.

4 SHEETS—SHEET 1.

Fig. 1.

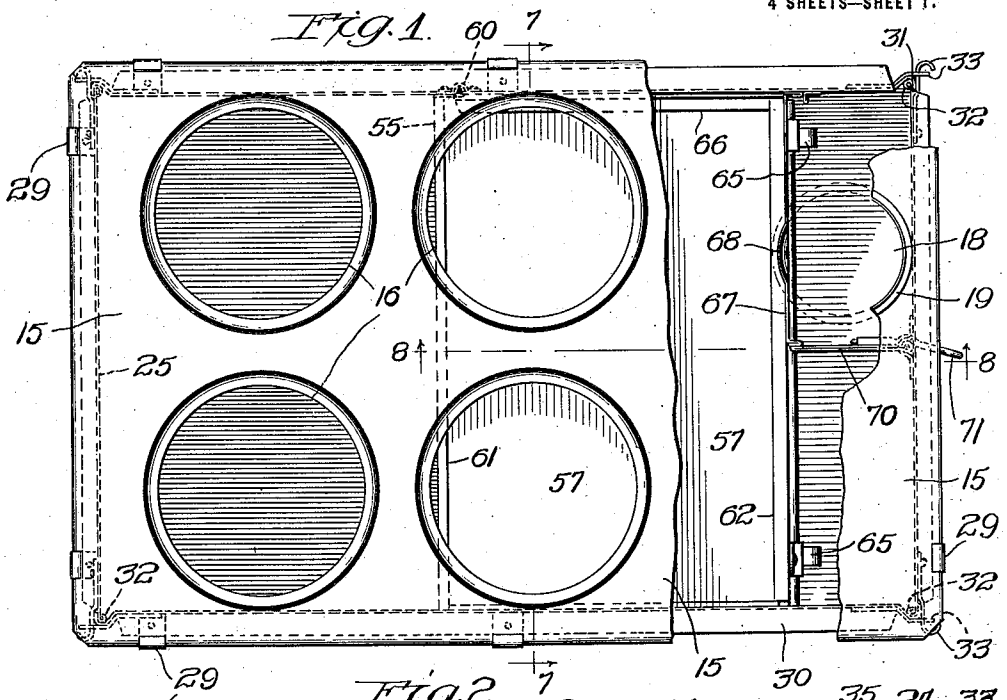
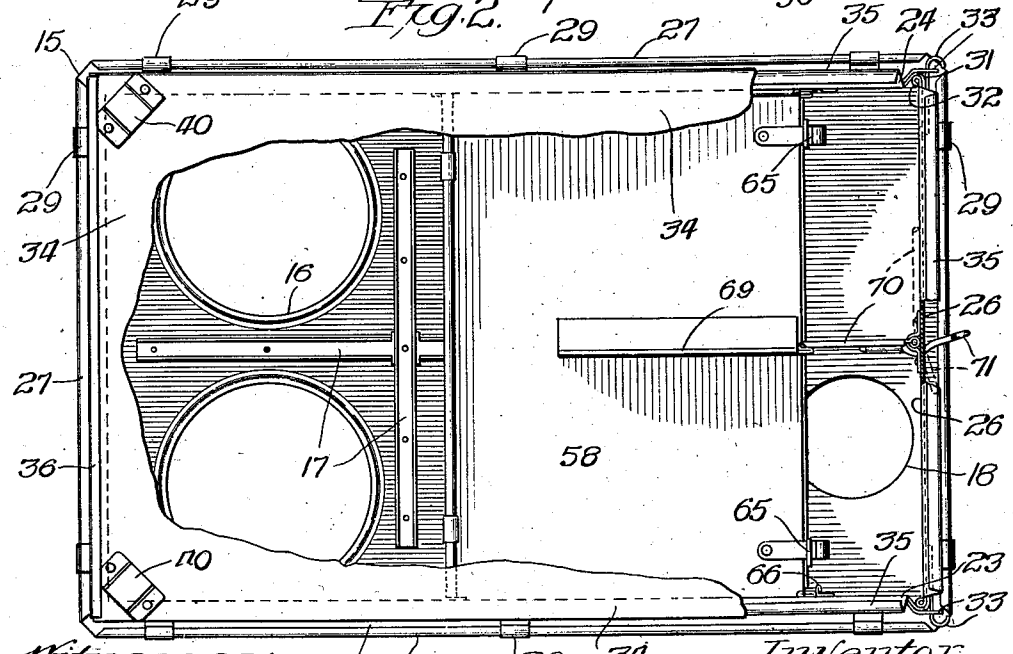


Fig. 2.



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4 SHEETS—SHEET 2.

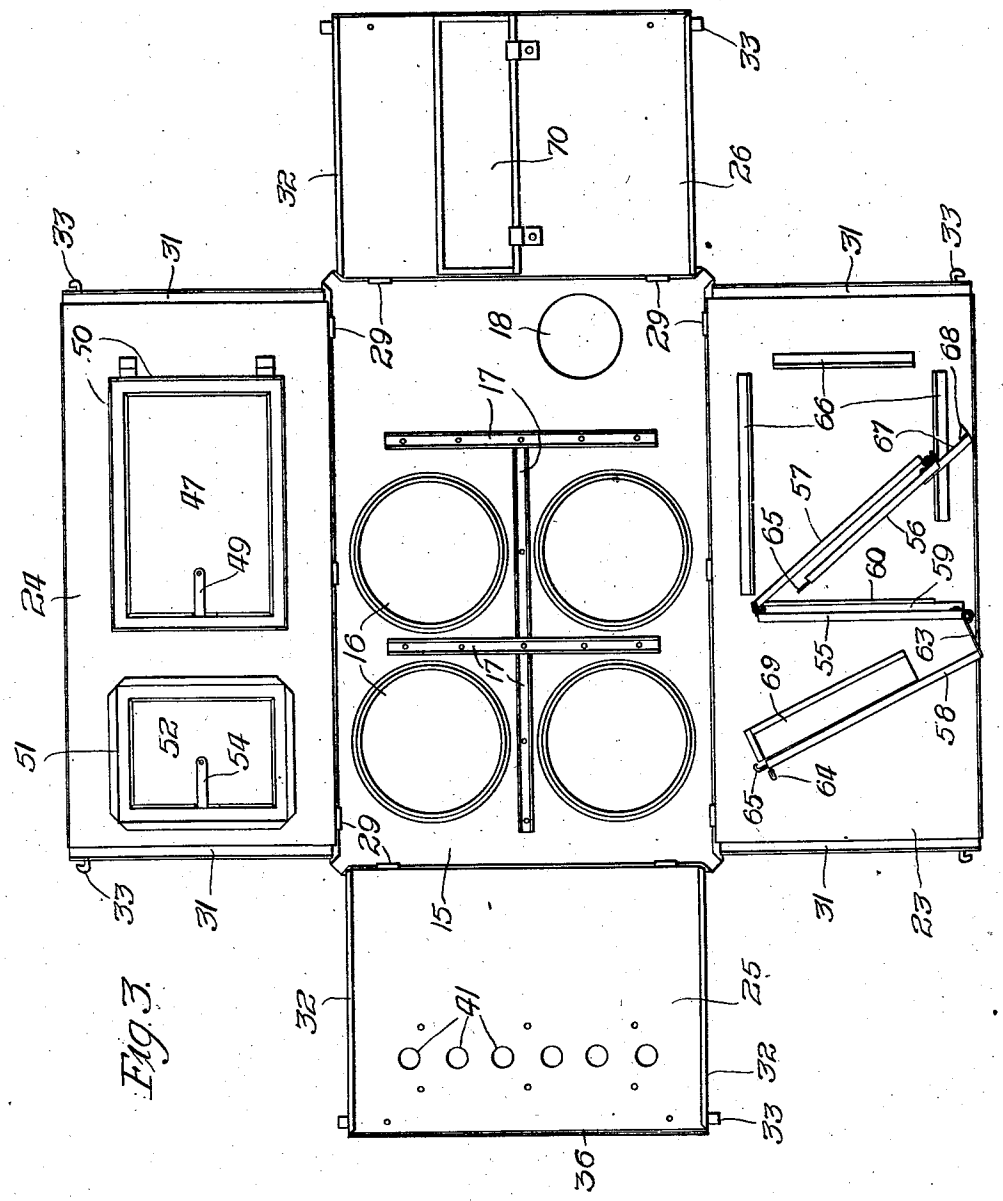


Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 4.

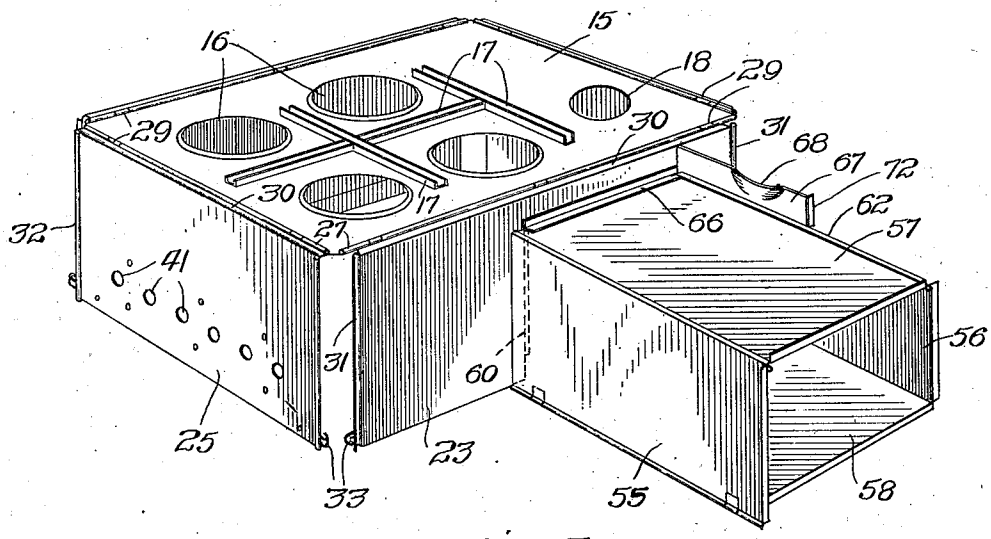


Fig. 5.

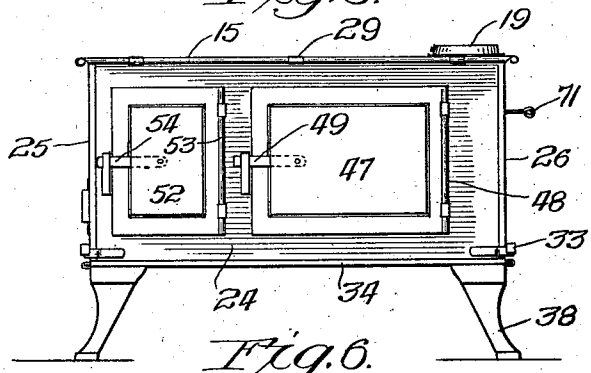
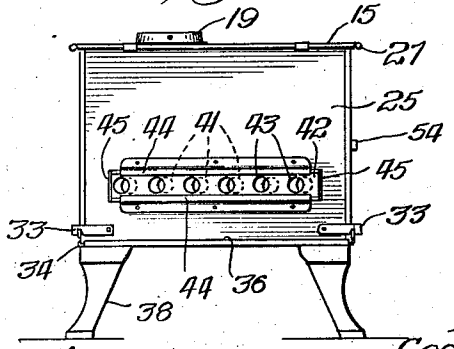


Fig. 6.



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4 SHEETS—SHEET 4.

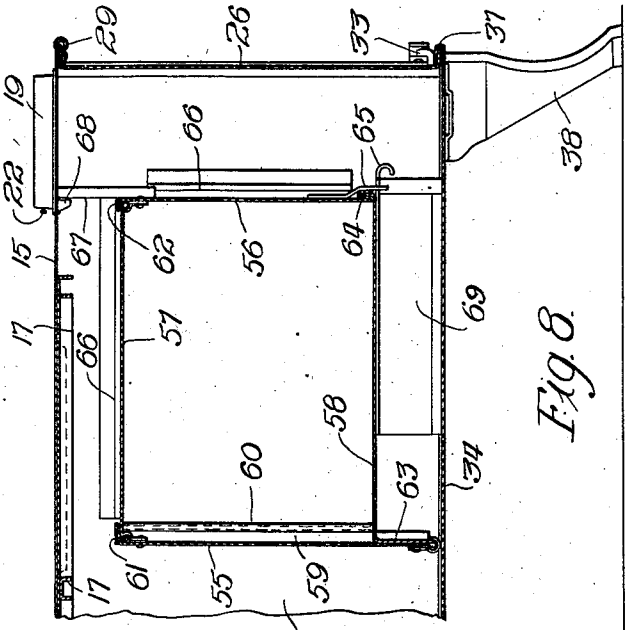


Fig. 8.

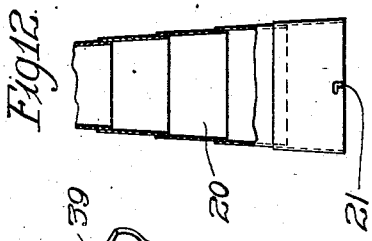


Fig. 12.

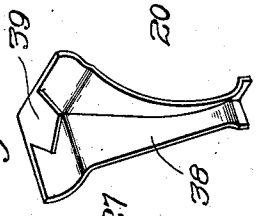


Fig. 11.

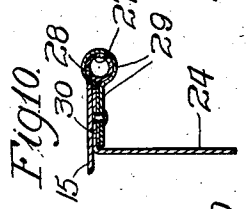


Fig. 10.

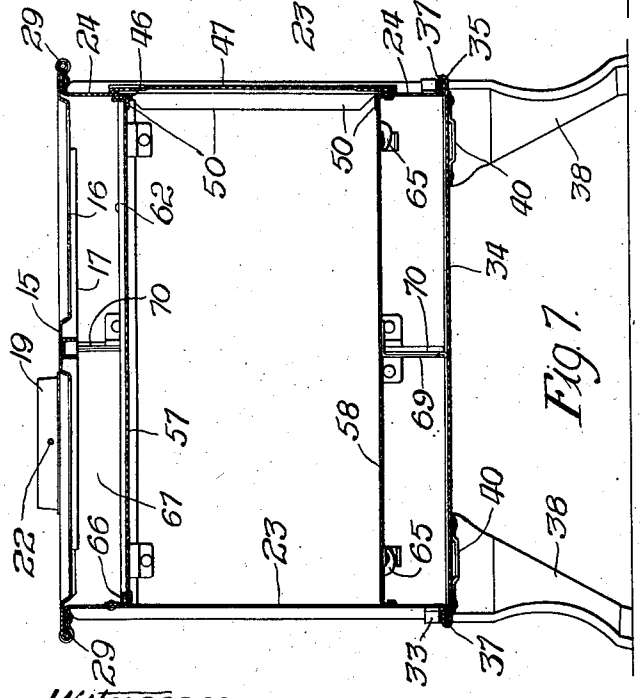


Fig. 7.

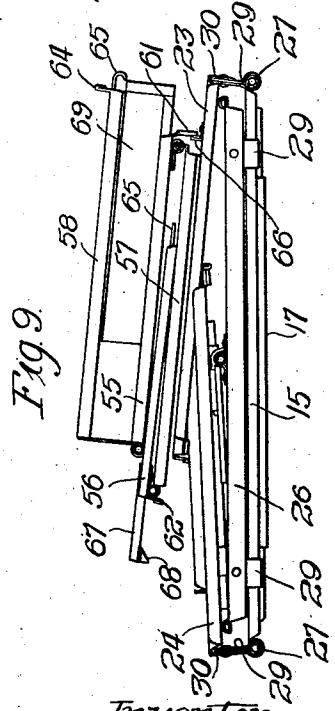


Fig. 9.

Witnesses.

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by

Miller & Chindahl

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UNITED STATES PATENT OFFICE.

GEORGE E. PICKUP, OF NEWARK, OHIO, ASSIGNOR TO THE WEHRLE COMPANY, OF NEWARK, OHIO, A CORPORATION OF OHIO.

COLLAPSIBLE STOVE.

1,187,009. Specification of Letters Patent. Patented June 13, 1916.

Application filed December 19, 1914. Serial No. 878,034.

To all whom it may concern:

Be it known that I, GEORGE E. PICKUP, a citizen of the United States, residing at Newark, in the county of Licking and State of Ohio, have invented certain new and useful Improvements in Collapsible Stoves, of which the following is a specification.

This invention contemplates an improved collapsible stove of simple construction which may be easily set up or collapsed by any inexperienced person.

One of the objects of the invention is to provide a collapsible stove of improved construction in which the walls are permanently hinged together to be folded alongside each other into a compact bundle for transportation or storage.

Another object of the invention is to provide a collapsible stove having a collapsible oven constructed and mounted in a novel and improved way.

The invention also relates to an improved manner of connecting together the parts of both the body of the stove and the oven whereby the movements to be given the parts in folding or unfolding the stove will be obvious from the relation of the parts, so that an inexperienced person can easily see how to set up or collapse the stove.

The invention further refers to the means for controlling the path of the products of combustion, so that the oven may be heated or not as desired.

The invention also refers to improved smoke-tight joints between the parts, and to other details of construction which will be fully pointed out in the following description.

In the accompanying drawings, Figures 1 and 2 are respectively a top and bottom plan view with parts broken away illustrating a stove embodying the features of my invention. Fig. 3 is an inside plan view of the stove spread out. Fig. 4 is a perspective view showing the stove in inverted position and partially folded. Figs. 5 and 6 are respectively a side and end elevation of the stove on a reduced scale. Fig. 7 is a vertical transverse section on line 7—7 of Fig. 1. Fig. 8 is a fragmental longitudinal vertical section on line 8—8 of Fig. 1. Fig. 9 is an end view of the stove completely collapsed. Fig. 10 is a sectional detail illustrating the means for connecting the vertical walls of the stove to the top wall. Fig. 11 is a perspective view of one of the stove legs. Fig. 12 is a fragmental elevation partially in section, illustrating the collapsible stove-pipe.

I will herein describe the invention according to the exemplary embodiment illustrated in the drawings without any intention, however, of limiting the invention to the arrangement of parts or the details of construction disclosed, except as defined in the language of the appended claims.

According to one feature of my invention, it is not necessary that the oven, nor indeed the bottom wall nor legs, be provided, inasmuch as a stove which would be very well suited for camping or similar purposes might comprise only the top wall and the vertical walls of the body, the lower edges of the vertical walls resting directly upon the ground. Such a stove would fall within the scope of my invention as regards the manner of connecting the walls of the body portion together.

When the oven, bottom wall, legs, etc., are provided, the usefulness of the stove is not limited to camping and similar conditions, but is suitable for ordinary domestic use.

The feature of collapsibility of the oven, as well as of the other parts, is advantageous to the manufacturer in shipping as well as to the user in transportation and storage.

In the construction shown in the drawings, all of the parts, except the legs, are made of sheet metal which conduces to cheapness in manufacture and shipment, and also to compactness of the collapsed structure and lightness of weight.

Proceeding now to the detailed description of the exemplary embodiment, the stove comprises a top plate or wall 15 having therein a suitable number of holes 16 arranged to be closed by the usual stove lids (not shown). When the top is made of sheet metal it may be reinforced by suitable bars 17 secured to the under side thereof. The top plate is provided at its rear end with a smoke opening 18 and a surrounding stove-pipe collar 19. The stove-pipe 20 (Fig. 12) is preferably made of telescopic sections arranged to collapse one within the other. If desired, means may be provided for locking the stove-pipe to the collar 19 upon the top plate. This means may consist of a bayonet slot 21 in the pipe adapted to receive a pin 22 (Fig. 7) in the collar.

Vertical side walls 23 and 24, a front wall

25, and a rear wall 26 are provided, each of said walls in the present instance being permanently hinged to the top wall 15 independently of the others. The hinge connection between the said vertical walls and the top wall may be provided by forming a curl or bead 27 (see Fig. 10) on each edge of the top plate and forming holes 28 through said plate adjacent to the bead 27 and spaced a suitable distance apart. These holes are adapted to receive hinge straps 29 which are fixed to the vertical walls and surround the beads 27. Adjacent to their upper edges the vertical walls are bent to provide shoulders 30 arranged to abut against the under side of the top plate 15 when the stove is set up, as best seen in Figs. 7 and 8. These shoulders lend rigidity to the structure and provide smoke-tight joints between the vertical walls and the top plate. In the present instance, the hinge straps 29 are separately formed and are secured to the outer sides of the offset portions or shoulders 30.

The abutting vertical edges of the walls at each corner of the stove are complementarily shaped to provide a smoke-tight joint. The edge of one wall is bent to form a groove 31 (Figs. 1, 2 and 3), while the edge of the other wall is formed into a bead 32 which constitutes a tongue or a wedge adapted to fit tightly in said groove to form an effective joint. The walls are latched together at the corners to prevent separation of these joints by a suitable number of pairs of locking devices 33, each of which may consist of a notched plate fixed to one wall and a plate pivoted to the other wall and adapted to enter the notch in the first plate.

The bottom wall 34 of the stove is secured in place by a slidable tongue-and-groove connection which, in the present instance, comprises an angular flange or tongue 35 on each of the two side walls 23, 24 and the rear wall 26, said tongues running approximately coextensive with the walls and projecting outwardly therefrom. The lower edge of the front wall 25 is bent to form a groove 36 opening inwardly. The bottom wall 34 is also bent to provide inwardly opening grooves 37 running along its two sides and its rear end, and adapted to receive the tongues 35 on the side and rear walls, while the forward edge of the bottom wall is arranged to enter the groove 36 at the lower end of the front wall.

The legs 38 (Fig. 11) are provided at their upper ends with horizontal inwardly extending lugs 39 adapted to enter bowed straps or loops 40 fixed to the under side of the bottom wall 34.

In the front wall 25 is provided a suitable draft-regulating means which, in the present instance, consists of a row of openings 41 (Fig. 6) through the front wall proper and a slidable plate 42 having a row of similarly spaced openings 43 therein arranged to be moved into different positions relative to the first mentioned openings by sliding the plate. The plate is guided by suitable strips 44 secured to the front wall and having their edges bent to overhang the edge of the slide plate. At opposite ends the plate 42 is provided with angular flanges 45 adapted to be engaged for moving the plate.

The side wall 24 is provided with a door-opening 46 (Fig. 7) for the oven, said opening being closed by a door 47 hinged at one edge 48 and arranged to be held closed by suitable latch means 49 (Fig. 5). At the edge of the door-opening 46 the side wall is provided with inwardly extending angular flanges 50 arranged to overlap the walls of the oven. The side wall 24 is also provided with a door-opening 51 for the fire box arranged to be closed by a door 52 hinged at 53 and having suitable latch means 54 for holding it in closed position.

The oven comprises front and rear walls 55 and 56 and top and bottom walls 57 and 58. One of these walls, in this instance the front wall 55, is hinged directly to the side wall 23 of the stove, while the other oven walls 56, 57 and 58 are not connected to the said stove wall 23, except through the front oven wall 55. The said front wall of the oven constitutes the rear wall of the fire box, said wall at its lower edge contacting the bottom wall 34 of the stove-body and terminating at its upper edge short of the top wall of the stove to leave a space between the top wall of the oven and the top of the stove for the products of combustion to pass through.

At its hinged end the front oven-wall 55 has a shoulder or offset portion 59, the hinge 60 being formed at the edge of this shoulder and the latter being arranged to abut against the stove wall 23 when in normal position. The top oven-wall 57 is hinged to the upper edge of the front wall 55 and the latter is provided with a shoulder 61 along its upper edge to limit the relative swinging movement of the two walls in one direction and to form a tight joint between the walls. The rear oven-wall 56 is pivoted to the rear edge of the top wall 57 and is provided with a shoulder 62 along its upper edge which forms a tight joint and limits swinging movement of the two walls away from each other in one direction. The bottom wall 58 is provided at its forward edge with an offset portion or shoulder 63 which abuts against the front oven-wall, and the edge of this shoulder is hinged to the lower edge of the said front wall. The shoulder 63 provides a space between the bottom wall of the oven and the bottom of the stove. The bottom oven-wall 58 has at its rear edge an angular flange 64 ar-

ranged to overlap the lower edge of the rear oven-wall 56, the two walls being detachably secured together by suitable latches 65. The flange 64 is tightly clamped against the rear wall 56 by the latch members thereon, as shown in Fig. 8, so that a tight joint is formed.

Suitable stop flanges 66 fixed on the side stove-wall 23 (best shown in Fig. 3) are adapted to determine the proper position of the oven walls in unfolding or setting up the latter. Said flanges also provide an overlap joint between the oven walls and the said side wall 23.

The rear oven wall 56 has rigidly fixed to its upper edge a plate 67 which extends upwardly into contact with the top wall 15 of the stove.

68 is an offset portion in the upper edge of this plate to conform to the smoke-opening 18 in the top wall. The plate 67 is only about half the horizontal length of the oven, or in other words is only about half as long as the stove is wide.

To the bottom wall of the oven is rigidly fixed a plate 69 running from front to rear of the stove substantially along a longitudinal median line thereof and contacting the bottom stove-wall 34.

A damper 70 which is of a height substantially equal to the height of the interior of the stove, is hinged at its rear edge to the rear wall 26 of the stove and is provided with a handle 71 which projects through said rear wall to be manually operated for controlling the position of the damper. Preferably, the wall 67 is provided with a stop flange 72 at one end, and the wall 68 projects beyond the edge of the bottom wall 58 of the oven, so as to form upper and lower stops against which the damper may abut when moved into operative position.

It will be noted that the stove-pipe collar 19 is located at one side of the longitudinal median line of the stove and directly behind the plate 67, so that said plate prevents the products of combustion from passing straight rearwardly to the smoke-opening 18.

When the damper 70 is in operative position, that is, perpendicularly to the rear wall of the stove, the products of combustion are compelled to pass downwardly behind the oven at one side of the damper, thence in a curved path beneath the oven, as directed by the plate 68, and then upwardly behind the oven at the opposite side of the damper and out through the stove-pipe. Thus when it is desired to use the oven for baking, the oven is heated from all sides. Ordinarily products of combustion pass through the space above the oven and thence around the plate 67 to the stove-pipe.

When the stove is to be collapsed, the stove-pipe 20 is removed and the stove-body is preferably then turned up-side down to facilitate the removal of the legs and the bottom wall 34. After these parts have been removed the catches 33 at the corners of the body are loosened and the walls are swung outwardly into the position shown in Fig. 3. The catches 65 for the oven walls 56 and 58 are then loosened and the bottom wall 58 is swung around to the outer side of the front wall of the oven, the rear oven-wall being swung in alongside the top wall and the two latter walls then being swung toward the front wall, as clearly indicated in Fig. 3. When the four oven walls lie parallel with each other, said walls are moved as a unit about the hinge 60 for the front wall, to lie approximately parallel to the side wall 23 of the stove-body. The plate 68 fixed to the bottom oven-wall is, of course, about the same height as the shoulder 63 of said wall so that the wall will be held in spaced relation to the front oven wall 55 when the oven is collapsed. The top wall 15 of the stove is now raised into position to permit of swinging the end walls around to the normal upper face of said top wall, whereupon the side wall 24 is swung over upon said end walls, and lastly the side wall 23 bearing the oven sections is swung alongside the other stove walls. The parts will then appear in rear end view as shown in Fig. 9, the oven walls being on top. The bottom stove wall 34, legs 38 and the collapsed stove-pipe 20 may be packed with the collapsed body structure into a very compact bundle. Inasmuch as the parts are made of sheet metal they may be compressed into a smaller vertical dimension than illustrated in Fig. 9.

The operation of setting up the stove is just the reverse of that just described and need be only briefly outlined. The parts are unfolded into the position shown in Fig. 3, the oven walls are set up, the end stove-walls are raised, the side wall 23 bearing the oven is raised and latched to the end walls, and the other side wall 24 is raised and latched to the end walls, the flanges 50 surrounding the oven door being telescoped into the oven. The bottom wall and legs are now put on and the stove is turned right side up and the stove-pipe put in place. If desired, a suitable grate (not shown) may be set in the bottom of the fire box.

I attribute particular importance to the fact that all of the walls of the stove and oven (except the bottom stove-wall) are permanently hinged together, because the manner of setting up or collapsing the stove is thereby pointed out to an inexperienced person and it is practically impossible to associate the walls in improper relation. The various shoulders and stop flanges also assist to this end by preventing the walls

from being swung in the wrong direction. Furthermore, when the walls are connected together the individual parts cannot be misplaced or lost.

I claim as my invention:

1. In a collapsible stove, a horizontal wall, vertical walls, each having at its upper edge a portion bent outwardly at substantially a right angle to provide a shoulder arranged to abut in parallel relation against the horizontal wall, means pivotally connecting said shoulder of each vertical wall to the adjacent edge of the horizontal wall whereby the vertical walls may swing outwardly about an axis at the outer edge of their shoulders and through an arc approximately three-quarters of a circle into position alongside the outer face of said horizontal wall.

2. In a collapsible stove, a sheet metal horizontal wall having one edge curled to form a bead, a sheet metal vertical wall having a portion bent outwardly at approximately a right angle thereto and providing a shoulder to arrange to abut in parallel relation against the face of the horizontal wall, and straps secured to said shoulder and passing through openings in the horizontal wall and around the bead on the latter to provide a hinge connection between the two walls and allow the vertical wall to swing through an arc of approximately three-quarters of a circle into position alongside said horizontal wall.

3. In a collapsible stove, a horizontal wall, four vertical walls each having at its upper end a portion bent outwardly at approximately a right angle thereto and providing a shoulder to abut in parallel relation against the face of the horizontal wall, said vertical walls being hinged to the horizontal wall to swing about axes located at the outer edges of said shoulders respectively, the vertical walls being adapted to swing through approximately three-quarters of a circle and lie alongside each other at the outer side of the horizontal wall when collapsed, the abutting vertical edges of each pair of vertical walls at the corners of the stove being bent to provide complementary tongues and grooves adapted to engage and provide smoke-tight joints, and another horizontal wall arranged to be operatively associated with the appropriate edges of the vertical walls.

4. A collapsible stove comprising a top wall, and a plurality of side walls each hinged at its upper edge to the top wall independently of the other side walls, all of said side walls being arranged to swing outwardly and fold over on top of the top wall into substantially parallel relation.

5. A collapsible stove comprising a horizontal wall, and a plurality of vertical walls each hinged at one edge to the horizontal wall, each of said vertical walls having a right angular shoulder adjacent to its hinge adapted to abut in parallel relation against the horizontal wall when the stove is set up.

6. In a collapsible stove, a horizontal wall, vertical walls independently hinged to the respective edges of said horizontal wall, the vertical walls being constructed to swing outwardly through approximately three-quarters of a circle and lie alongside the horizontal wall at the outer face of the latter and an oven comprising four walls permanently hinged together, one of said oven walls being permanently hinged to one of the said vertical walls of the stove.

7. In a collapsible stove, a body comprising a top wall and a plurality of vertical walls, the top wall having a bead along each of its edges, the vertical walls having right angular shoulders at their upper edges arranged to abut in parallel relation against the under side of the top wall, said shoulders having straps encircling the beads on the top wall to form hinged connections between the top wall and the vertical walls.

8. In a collapsible stove, a wall having a bead at its edge and having an opening adjacent to said bead, another wall bent at right angles and adjacent to its edge to provide a shoulder arranged to abut in parallel relation against the first wall adjacent to said bead when the walls are perpendicular to each other, and a strap fixed to said shoulder and passing through said opening and around said bead to form a hinged connection between the two walls.

9. In a collapsible stove, a horizontal wall and vertical walls permanently hinged together, and an oven comprising four walls permanently hinged together, one of the oven walls being permanently hinged on a vertical axis to one of the vertical stove walls.

10. In a collapsible stove, a horizontal wall, four vertical walls independently hinged to the respective edges of the horizontal wall, and an oven comprising four walls permanently hinged together, one of the oven walls being permanently hinged to one of the vertical stove walls.

11. In a collapsible stove, a horizontal wall, two side walls, a front wall and a rear wall, said side, front and rear walls being independently hinged to the respective edges of said horizontal wall, and an oven comprising walls permanently hinged together, one of the oven walls being permanently hinged to one of said side walls of the stove to permit the oven as a unit to fold alongside the latter side wall.

12. In a collapsible stove, a body portion including a vertical wall and an oven comprising walls hinged together, one of the oven walls being hinged on a vertical axis to said vertical stove wall.

13. In a collapsible stove, the combination of a collapsible body portion, and an oven inclosed within the body portion and comprising a wall permanently pivoted to one of the walls of said body portion and three other walls pivotally connected in a permanent manner to the first mentioned oven wall, said body portion when collapsed being turned in-side-out and the collapsed oven being then located on the outer side of the body portion.

14. In a collapsible stove, the combination of a body portion comprising walls permanently hinged together and arranged to collapse, and a collapsible oven comprising four walls pivotally connected to each other in a permanent manner, one of the oven walls being permanently pivoted to one of the walls of the body portion.

15. In a collapsible stove, the combination of a body portion comprising collapsible walls pivoted together and adapted to be turned in-side-out when collapsed, and an oven comprising walls pivoted together to fold alongside each other, one of the oven walls being permanently pivoted to one of the body portion walls, whereby the collapsed oven as a unit may fold alongside the mentioned body portion wall, and lie at the outer side of the collapsed body portion.

16. In a collapsible stove, the combination with a vertical wall forming part of the body of the stove, of an oven comprising a wall permanently pivoted on a vertical axis to said vertical wall, and three other walls pivotally associated with the first wall and arranged to fold alongside the latter, whereby the folded oven as a unit may swing to lie alongside the said vertical wall.

17. In a collapsible stove, the combination of two opposite vertical walls, an oven comprising collapsible walls permanently pivoted to one of said vertical walls, and a door in the other vertical wall arranged to open into the oven.

18. In a collapsible stove, a body having collapsible walls permanently pivoted together and including two opposite vertical walls, an oven comprising collapsible walls permanently pivoted to one of said vertical walls, the other vertical wall having a door-opening therein which is surrounded by the oven walls, inwardly extending projections on the last mentioned vertical wall engaging the oven walls, and a door for closing said opening.

19. In a collapsible stove, a body portion including a vertical wall, and an oven comprising four walls, one of which is hinged on a vertical axis to said vertical stove wall, two of the other oven walls being hinged to the upper and lower edges respectively of the first mentioned oven wall and the fourth oven wall being hinged to one of said two walls.

20. In a collapsible stove a body portion including a vertical wall, and an oven comprising a vertical front wall hinged on a vertical axis to the vertical wall of said body portion, a bottom wall having a right angular shoulder hinged at its edge to the lower edge of said vertical oven wall, a top wall hinged to the other edge of the vertical oven wall, and a rear oven wall hinged to the rear edge of said top wall.

21. In a collapsible stove, a body having top and bottom walls and front, rear and side walls arranged to be collapsed, the top wall having a smoke-opening at its rear end and at one side of the longitudinal median line of the stove, an oven located within the body and comprising collapsible walls, the front wall of the oven constituting the rear wall of the fire-box and contacting the bottom wall of the stove, the top, rear and bottom walls of the oven being spaced from the adjacent walls of the stove to form a draft passage, a vertical transverse plate fixed to the oven directly in front of said smoke-opening, a single vertical longitudinal plate permanently fixed to the bottom wall of the oven and positioned substantially midway between the side walls of the body, and a damper pivoted to the rear wall of the stove-body to coöperate with said two vertical plates in controlling the draft.

22. In a collapsible stove, the combination with a side wall forming part of the body of the stove, of an oven comprising top and bottom walls and two vertical walls, one of said vertical walls being hinged at its edge to the said side wall of the body, the bottom wall being hinged to the mentioned vertical wall to swing around to the outer side thereof, the top wall being hinged to the said vertical wall to swing toward the inner side thereof, the other vertical wall of the oven being hinged to the said top wall to swing inwardly and lie between the said top wall and the first mentioned vertical wall, and the collapsed oven as a unit being arranged to swing to lie alongside of the said side wall of the stove-body.

23. In a collapsible stove, the combination with a side wall forming part of the body of the stove, of an oven comprising a front wall hinged at one edge to the said side wall of the body, a bottom oven-wall hinged to the lower edge of the said front wall and adapted to swing around to the outer side thereof, a top wall hinged to the upper edge of the said front wall and adapted to swing toward the inner side thereof, a rear wall hinged to the rear edge of the top wall and adapted to swing inwardly and lie between the top wall and the front wall, and the oven walls as a unit being arranged to swing around the

hinge for the front wall to lie alongside the said side wall of the stove-body.

24. In a collapsible stove, a body having top, bottom and vertical walls arranged to be collapsed, an oven comprising a front wall hinged to one of said vertical walls, the lower edge of said front wall lying close to the bottom wall of the stove body, a bottom oven-wall having an offset shoulder which is hinged at its edge to the lower edge of the front wall, a top oven-wall hinged to the upper edge of said front wall, and a rear oven-wall hinged to said top oven-wall.

25. In a collapsible stove, the combination of top, side, front and rear walls all formed of sheet metal, the upper edge of each of the side, front and rear walls being bent to provide an offset shoulder adapted to abut against the under side of the top wall when the other walls are in vertical position, hinges independently connecting the top wall with each of the other walls, the vertical edges of said side, front and rear walls being complementarily formed to provide interlocking joints at the corners of the stove, and means for securing the corner portions together.

26. In a collapsible stove, a body comprising walls permanently hinged together, and an oven inclosed within the body and comprising four walls permanently hinged together, one of the oven walls being permanently hinged at one edge to one of the body walls to permit the collapsed oven to swing as a unit and lie alongside the mentioned body wall.

27. In a collapsible stove, a body having a top wall and vertical walls permanently hinged together, and an oven inclosed within the body and comprising four walls permanently hinged along a vertical axis together, one of the oven walls being hinged to one of the vertical walls of the body.

In testimony whereof, I hereunto set my hand in the presence of two witnesses.

GEORGE E. PICKUP.

In the presence of—
C. H. HAHN,
D. N. SKINNER.