This invention relates to portable stoves and more particularly to an improved demountable stove of this type so constructed that all components can be stored within the firebox when the stove is not in use for convenience in handling, shipping and storing the same.

There have been many prior proposals for portable stoves suitable for use by campers embodying a variety of arrangements for collapsing the structure or disassembling the parts when the stove is not in use. However, for the most part these have been special purpose stoves with limited versatility and capabilities rendering them quite unsatisfactory for use by those having need for the capabilities of large stoves and the advantages of a readily portable stove. For example, prior constructions lack provision for baking foodstuffs or for keeping others warm while the stove top proper is being used to cook foods. Another shortcoming of prior designs has been the omission of suitable provision for both open top and closed top cooking at the option of the user together with easily operated means by which the grill and the imperforate top may be used interchangeably and selectively across the top of the firebox while the other is employed as a shelf to one side of the firebox, thereby greatly increasing the working and support area of the stove.

These prior constructions have failed to provide a medium-sized, readily demountable stove which is small and compact yet which has made satisfactory provision for cooking, baking, barbecuing and broiling foodstuffs. Nor has there been provided heretofore reliable and satisfactory means for safeguarding against the escape of the fire into the surrounding area, as well as protection of foodstuffs on the cooking top against windy conditions.

It is an object of the present invention to provide a demountable portable stove exhibiting features of utility and convenience not found in prior stove constructions.

Another object of the invention is the provision of a combined heating and cooking stove having a shallow firebox and a wide area top adapted to be covered selectively either by a barbecue grating or by an imperforate cooking top. Another object of the invention is the provision of a demountable portable stove having a collapsible oven adapted to be used selectively while supported either against the underside of the firebox or on the cooking top.

Another object of the invention is the provision of a portable demountable stove having a collapsible oven adapted to be used selectively while supported either against the underside of the firebox or on the cooking top.

Another object of the invention is the provision of a collapsible oven for use with a portable stove, the oven being formed of interfitting sheet metal panels cooperating to form a substantially fluid-tight oven when assembled and to be packaged flat against one another when disassembled.

Another object of the invention is the provision of a portable cooking stove having a pair of nesting tray members adapted to be supported selectively beneath the firebox in position to prevent embers escaping from the stoking opening from dropping to the floor and, at other times, the tray being supported in an upright position along edges of the cooking top.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawings to which they relate.

Referring now to the drawings in which a preferred embodiment of the invention is illustrated:

FIGURE 1 is a small scale perspective view of a stove embodying features of the present invention and showing ember catching means used alternatively as a windbreak, the latter mode of use being indicated in dotted lines;

FIGURE 2 is a front elevational view of the stove shown in FIGURE 1 on an enlarged scale, the upper portions of the smokestack and windbreak being broken away;

FIGURE 3 is a view similar to FIGURE 2 but taken from the left side and showing the windbreak members supported along the side and rear of the cooking top rather than horizontally as a shelf between the stove supporting legs;

FIGURE 4 is a fragmentary front elevational view of the stove on a reduced scale showing portions of the stove broken away, the cooking top being shown as a shelf to one side of the firebox and the grating being shown supported across the top of the firebox;

FIGURE 5 is a cross-sectional view on a slightly reduced scale taken along line 5—5 on FIGURE 2;

FIGURE 6 is a fragmentary sectional view taken along line 6—6 on FIGURE 2;

FIGURE 7 is a fragmentary view on an enlarged scale showing the detachable connection between the firebox and a supporting leg;

FIGURE 8 is a fragmentary sectional view showing a detail of the assembly joint employed to hold the windbreak members in assembled position, the view being taken along line 8—8 on FIGURE 3;

FIGURE 9 is a fragmentary sectional view on an enlarged scale taken along line 9—9 on FIGURE 3;

FIGURE 10 is a perspective view of the collapsible oven in readiness for use with the stove of this invention;

FIGURE 11 is a cross-sectional view on a vertical plane taken along line 11—11 on FIGURE 10;

FIGURE 12 is a similar longitudinal sectional view of the oven taken along line 12—12 on FIGURE 10;

FIGURE 13 is a fragmentary view of one of the oven joints on an enlarged scale and taken along the plane indicated at 13—13 on FIGURE 10; and

FIGURE 14 is a similar view to a front corner of the oven taken along plane 14—14 on FIGURE 10.

Referring now more particularly to FIGURES 1, 2 and 3, there is shown a stove designated generally 10 embodying the features of the present invention. The firebox comprises a generally rectangular piece with open-topped box 11 of heavy gauge metal sufficiently deep to provide adequate room for fuel supported by suitable grating 12 of expanded metal or the like. Grating 12 is loosely supported interiorly of the firebox in any desired manner as by angle iron members 13 secured to the side walls of the firebox.

Firebox 11 may be supported at a convenient operating level upon the floor or ground as by legs 14 of metal tubing having their upper ends seated in sockets 15 secured to the lower corners of the firebox. Legs 14 may be provided with threads mating with internal threads of sockets 15 or the sockets may be provided with thumb nuts 16 (FIGURE 7) effective to clamp the legs in assembled position within sockets 15. Each of legs 14 preferably includes one or more openings 18 having multiple functions. For example, when the stove is set up out of doors, water may collect interiorly of the legs and be prevented from escaping due to the nature of the ground or because the ground is frozen. In this event, steam may be formed by heat conveyed downwardly along the legs and give rise to a dangerous condition. Openings 18 safeguard against this hazard by venting the steam to the atmosphere. Ad-
The flattened upper end 46 of pipe section 43 seats a thumb nut 47 having its inner end secured to smokestack 37. Pipe section 43 is provided with openings 48 to receive the fire poker, whereas the lower section is provided with an elongated dimpling of the legs relative to sockets 15. Other of the openings in the stove legs have support functions as will be explained more fully presently.

The front of the firebox is provided with a large area access opening for adding fuel to the fire and withdrawing ashes. This opening is normally closed by a door 20 pivoted to one edge of the access opening, as by a hinge 21. The lower edge of door 20 is formed with air inlet openings 22 suitably regulated to control the fire as by a damper control plate 23 having openings which can be moved into and out of different positions of registry with respect to air inlet opening 22. Door 20 is normally held closed by a latch 24.

The cooking surface of firebox 11 is formed either by an imperforate metal cover plate 25 or by a grating 26 of wire or metal striping. Both cooking top 25 and grating 26 are substantially the same size to the end that they can be supported interchangeably on the upper edge of firebox 11. In FIGURES 1 and 2, top 25 is shown nested over the firebox and grating 26 is shown supported as a shelf laterally to the right hand edge of cooking top 25. However, in FIGURE 4 the alternate position of the grating and cooking top are shown, top 25 there serving as a shelf to one side of the firebox. Cooking top 25 is preferably formed of heavy gauge metal similar to that used in fabricating the firebox and has downturned rims 27 fitting against the side walls of the firebox. As is made clear by FIGURES 2 and 4, one of the cover flanges 28 has fixed thereto upturned tangs 29 engageable about frame 29 for grating 26. When the grating is used as a shelf in the typical manner shown in FIGURE 2, one side of frame 29 engages over tank 28 and the opposite side of the grating seats in notches 30 in struts or brackets 31 having the other ends connected as by pin 32 to the stove supporting legs. Preferably, struts 31 are formed in sections held in overlapping clamped position by a pair of bolts 33, 33. In the disassembled position of the parts, at least one of bolts 33 is removed so that the two halves of strut 31 may be folded for stowing within the firebox. Preferably, barbeque grating 26 is held locked to struts 31 by an L-shaped hook 34 secured to grate frame 29 in such position that its horizontal leg will seat in a notch 35 in the edge of strut 31 in the manner made clear by FIGURE 2.

Referring to FIGURE 4, it will be seen that when cooking top 25 is supported as a shelf to one side of the firebox, one of its downturned rims 27 hooks over a pair of tongs 35 fixed to the side of the firebox in such a position that the surface of top 25 is substantially level with grating 26 in its alternate operating position over the upper rim of the firebox. Under these conditions the rim of top 25 remote from the firebox seats in notches 30 of struts or brackets 31.

When cooking top 25 is in place over the firebox, smoke and the products of combustion escape to a conventional smokestack 37 through a flanged opening 38 near the rear edge of top 25. Flange 38 projects upwardly and provides a snug friction fit with the oval shaped lower end of stack 37. Preferably, stack 37 is formed in two sections which telescope together with one section carrying the usual damper 39. The end of the upper section may be provided with a spark guard 40 in the form of a wire mesh cap.

To reinforce stack 37 and avoid danger of dislodging by wind, a remarkably sturdy construction is provided comprising a pair of pipe sections 42, 43 coupled together by a coupling 44. The lower threaded end of section 42 seats in a threaded opening of a socket 45 secured to rim 27 at the rear side of cooking top 25. The flattened upper end 46 of pipe section 43 seats a thumb nut 47 having its inner end secured to smokestack 37. Pipe section 43 is provided with openings 48 to receive the fire poker, whereas the lower section is provided with an elongated dimpling of the legs relative to sockets 15. Other of the openings in the stove legs have support functions as will be explained more fully presently.

Under certain conditions pipe sections 42, 43 are not required to reinforce the smokestack in which event they may be used to supplement struts 31, 31 in supporting either cooking top 25 or grating 26 when acting as a shelf to one side of the firebox. Pipe sections 42 and 43 are so used in FIGURE 2, it being understood that upper section 43 may be provided with a tang engageable with the edge of top cover 25 or of grating 26. Alternatively, the tang may be mounted on members 25 and 26 and arranged to engage in an opening formed in pipe section 43. Normally, strut 42 is used only to supplement struts 31 when cooking top is used as a shelf (FIGURE 4).

Referring now to FIGURES 1, 2 and 3 attention is directed to a pair of nestable shallow trays 52, 53 so designed that they may be used in several different ways as requirements dictate. Slightly larger tray 52 is provided with two pairs of tangs 54 along its opposite sides positioned to engage openings formed in stove legs 14 to support this tray rigidly between the stove legs under certain operating conditions. Tray 52 preferably has upturned side walls and a rear end wall but no front end wall whereby slightly smaller tray 53 may be slid to and fro drawer fashion from the forward end of the larger tray. When withdrawn as it is in FIGURE 3, tray 53 underlies door 20 of the firebox and is highly effective in catching embers which may escape through air control openings 22 in door 20. If not caught, such embers could present a very real hazard to the surroundings. At other times smaller drawer 53 may be inverted and cooperate with larger drawer 52 in providing a strong shelf supporting articles while being dryed utilizing the heat of the firebox. One particularly desirable practice is to use the shelf to support wet firewood before it is placed in the firebox.

In another frequent use of shallow trays 52, 53 they are mounted in an upright position along edges of the stove top where they serve to protect operations being carried on top of the stove from outdoor wind conditions. To this end each of the trays is preferably provided with a U-shaped flange 55 along one rim edge having a loose sliding fit with a complementary shaped U-flange 56 of an elongated bracket member 57 secured to firebox 11. The details of these interlocking supporting joints between the windguard trays and the firebox are best shown in FIGURE 9, it being pointed out that a similar pair of brackets and mating lines 56, 57 extend along at least one side wall of firebox and the rear wall therefrom.

From the foregoing description of trays 52, 53 it will be understood that these trays can be assembled for use as windguards simply by sliding U-shaped flange 55 of each into mating relation with the complementually shaped flange 56 of brackets 57. Additionally, the rear end wall of tray 52 is preferably provided with a leaf-spring 58 having one end riveted thereto at 59. A pin 60 on the free end of spring 58 is adapted to extend into an opening 61 (FIGURE 9) in the bottom of tray 53 when the latter is properly assembled as a windguard with its open rear edge seated against the interior bottom of tray 52 as it is in FIGURE 3.

Referring now to FIGURES 10 through 14 there is shown a collapsible oven suitable for use with the described stove. This oven, designated generally 70, is formed of sheet metal with its lateral edges shaped to...
have a sliding interlocking fit with one another and co-operating to provide a rigid self-supporting oven which is substantially airtight and which is held rigidly assembled without need for fasteners.

Oven 5 comprises a plurality of sheet metal plaques including a bottom wall 71, identical side walls 72, 72, a rear end wall 73, a top wall 74 and a front wall 75 having an opening 76 normally closed by a door 77 hinged thereto at 78 and having a door handle 79. Side walls 72 have outturned flanges 80 along their upper and lower inner U-shaped reversely bent lateral edges 81, 81 of top and bottom wall 71, 74, respectively. The opposite ends 83, 83 of bottom walls 71 are turned upwardly at right angles to the bottom to lie snugly against the exterior surfaces of the juxtaposed portions of end walls 73, 75. Rear end wall 73 has an outturned flange 84 along its upper edge which nests within the reversely bent U-shaped rear edge 85 of top wall 74. The front edge 86 of top wall 74 is turned upwardly at right angles to the top wall and fits similarly within the reversely bent upper edge 87 of front wall 75. The front vertical edges of side walls 72, 72 are bent upwardly as indicated at 88, 88 to lie flush against the opposite vertical edges of front end wall 75 in the manner best illustrated in FIGURE 10. Likewise, the vertical rear ends of side walls 72 are similarly bent forward one another to lie flush against rear end wall 73, these turned edges being designated 89 as are the corresponding front end edges.

From the foregoing it will be readily understood that oven 70 may be assembled by sliding outturned tabs 80, 80 of side walls 72 rearwardly along the reversely bent flanges 81 of bottom wall 71. Rear end wall 73 is then inserted downwardly inwardly of tabs 83 along the ends of side walls 72. Thereafter, top wall 74 is slid forwardly from the rear end of the oven with outturned flanges 80 of the side walls nesting within U-shaped flanges 82 of the top wall. In the final step of the assembly operation, front end wall 75 is slid downwardly from the top of the oven until reversely bent flange 87 along its top edge nests over outturned flange 86 of top wall 74. All parts are now locked rigidly in assembled position.

It will be recognized that oven 70 may be used either while supported against the bottom of firebox 11 or on cooking top 25. Mounting of the oven 70 beneath the firebox is accomplished by inserting outwardly directed flanges 82, 82 along the upper lateral corners of the oven into guide channels 90, 90 secured along the bottom of firebox 11. In FIGURES 2 and 4. With the oven used beneath the firebox for baking as distinguished from food warming, it is usually desirable to remove fire grate 12 from the firebox allowing the coals and embers to burn while supported directly against the bottom of the firebox. Empting of the coals is done by first removing cooking top 25 and then replacing using a suitable hook or other tool to withdraw grate 12 upwardly through the top of the firebox as the coals are slid therefrom into the firebox with a minimum of disturbances. After the baking operation is over, the grating may be reinserted and the coals returned to the top by the use of a top open fire door 26; or the fire may simply be rebuilt on top of the grate using the coals thereby to ignite the fresh fuel. At other times it may be desired to use the oven on top of the stove. In this event the oven is pulled forwardly along guide rails 90 and transferred to cooking top 25 so that the stove heat is transferred to the oven through its bottom wall 71.

When using the stove to grill or barbecue food, cooking top 25 is replaced with grating 26, the cooking top then preferably being substituted as a shelf to one side of the stove in the manner made clear by FIGURE 4. In view of the detailed description given above of the various components and their mode of use, as for example the different modes of utilizing trays 52, 53, it is believed unnecessary to repeat and summarize the operation of the complete assembly.

When it is desired to move the stove or to store it after a period of use, the various components are disassembled in a manner which will be obvious from the foregoing detailed description. After removing the cooking top, grating 12 is transferred from its normal operating position on supports 13 to a position of rest against the bottom of the firebox. It will be understood that all components are shorter in length and width than the interior dimensions of the firebox with the result that each can be stored therewith including the smokestack sections. Grating 26 can be stowed diagonally across the interior of the box, certain of the components first being stored beneath its higher edge following which the remaining components are stowed above the grating. Finally, top 25 is replaced and secured in place by suitable fastening means or strapping in order that the entire assembly packaged within the firebox can be carried or stored in any position.

While the particular demountable portable stove hereinafter shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

1. A demountable readily portable stove and barbecue comprising a combined sheet metal carrying case for enclosing all parts of the stove when disassembled and an open-topped one-piece firebox adapted to be covered selectively by a separate grating and by a separate solid top depending upon the cooking operation being performed and forming separate components of said stove, a socket means carried by said firebox, and legs for supporting said firebox horizontally at a convenient operating height with their upper ends detachably seated in said sockets, a readily collapsible sheet metal oven having top, bottom, and side walls, said oven having flange means extending longitudinally of the upper lateral corners of said side walls, said oven being adapted to be mounted on the bottoms of said fire box adapted to mate with said oven flange means and to receive said flange means slidingly to support the top wall of the oven in close heat exchange relation with the bottom of said firebox.

2. A portable stove as defined in claim 1 characterized in the provision of shallow pan means on said legs normally supporting said pan means horizontally between said legs and adapted to serve as a shelf as well as a spark catcher for sparks escaping from the firing opening to said firebox, and means along the peripheral edges of said firebox for temporarily supporting said pan means in an upright position thereby providing a windbreak for the top of said stove when the same is used out of doors under windy conditions.

3. A portable stove as defined in claim 2 characterized in that said pan means includes a plurality of nestable pans cooperating with one another to provide a windbreak along merging peripheral edges of said firebox.

4. A portable stove as defined in claim 2 characterized in that said pan means includes a plurality of nestable pans one of which is stidable to and fro lengthwise of the other when the said other pan is supported between said legs, and interchangeable tang and detent means on said legs and on said other pan means for supporting the latter from said legs.

5. A portable stove as defined in claim 2 characterized in the provision of means along the outer side walls of said firebox engageable with a rim edge of said lateral means and cooperating therewith to support said pan means rigidly in an upright position along said firebox without interfering with the assembly and disassembly of said
imperforate top and of said grating to and from said firebox.

6. A portable stove as defined in claim 1 characterized in that said oven comprises plaques of sheet metal having flanged peripheral edges formed to interfit slidingly with one another to provide a rigid substantially air tight structure having an access opening in one end thereof, closure means for said access opening, the flanged edges of said oven along the upper lateral corners thereof projecting laterally away from one another to seat over said cooperating support means in the bottom of said firebox.

7. A portable demountable stove and barbecue comprising an open-topped sheet metal firebox, detachable leg means for supporting said firebox at a convenient operating height, a grating member, a solid top plate member having downturned rim flanges snugly embracing the upper rim edges of said firebox, said grating member and said solid top plate members being usable selectively and interchangeable with one another for support on the top rim of said open-topped firebox with the one covering the firebox while the other is used as a shelf laterally along one side of said firebox and in substantially a common plane with the other of said members, and means cooperating with said firebox and stove in rigidly supporting said one of said members while being used as a shelf horizontally closely beside one lateral edge of said firebox.

8. A portable stove as defined in claim 7 characterized in the provision of means carried by said downturned rims to interfit with a portion of said grating member to support the same when said solid top plate member is in place across the top of said firebox.

9. A demountable portable stove all parts of which are adapted to be stored when disassembled within the confines of the stove firebox, said stove comprising a generally rectangular sheet metal firebox having a normally closed firing opening in one side wall, a removable top having downturned rims fitting about the side walls of said firebox, a removable fire grate adapted to be supported between the bottom and removable top for said firebox, detachable legs engageable with recesses in the lower portion of said firebox to support the same above the ground, and a collapsible oven adapted to be supported selectively closely against the exteriors of said firebox bottom and of said top at the user's option, said legs, grating and oven being storable entirely within said firebox in the disassembled condition of the stove components.

10. A portable stove as defined in claim 9 characterized in that the components storable within said firebox include a grating usable in lieu of said stove top and additionally a combination wind guard and spark guard, said guard including means for supporting the same selectively between said legs with its forward edge underlying the area below and in front of said firing opening and in a second upright position along one side of said stove to protect the cooking surface thereof under windy conditions.

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