March 28, 1939. L. H. ANDERSON ET AL 2,152,168

CAMP STOVE

Filed Aug. 25, 1938 2 Sheets-Sheet 1

Fig. 1

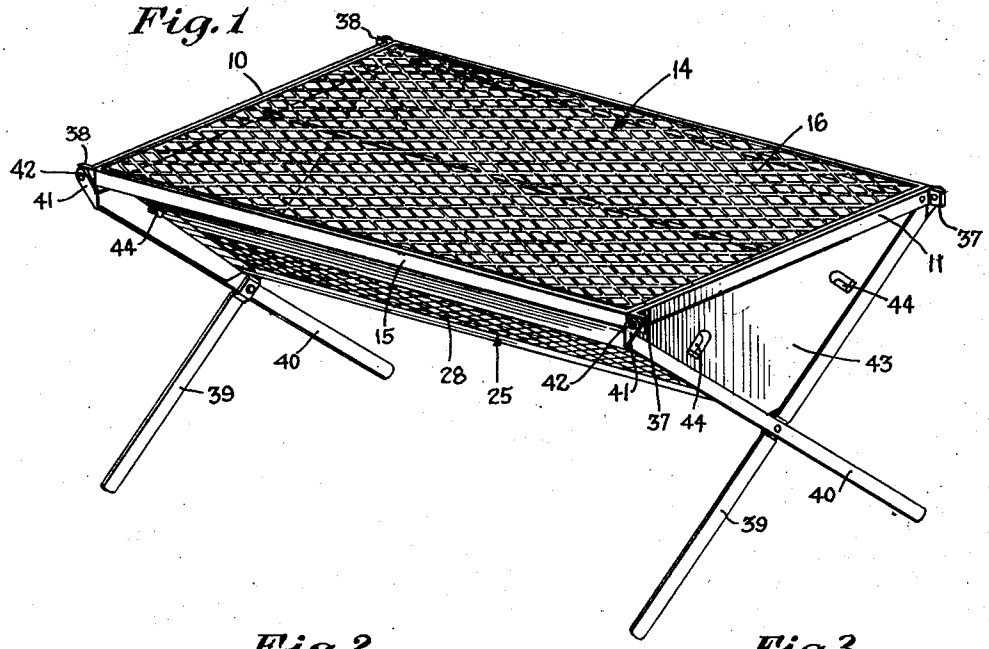

Fig. 2

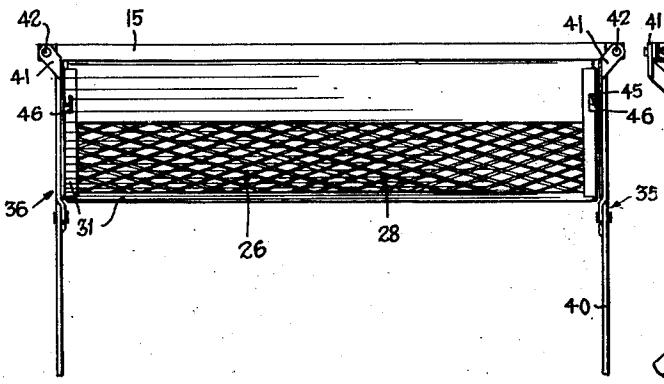

Fig. 3

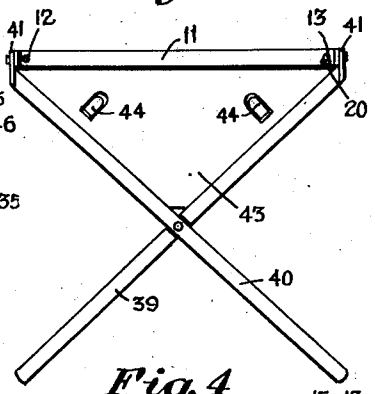

Fig. 4

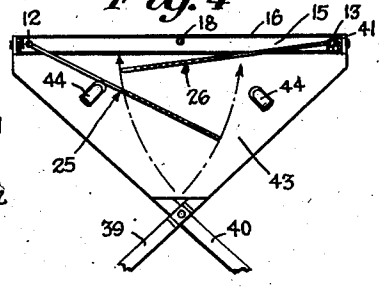

Fig. 5

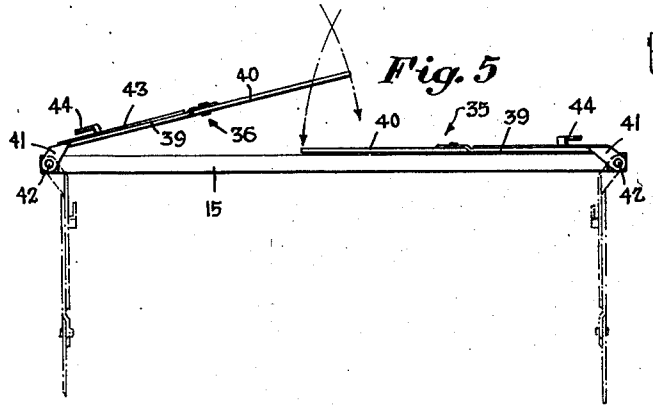

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Fig. 6

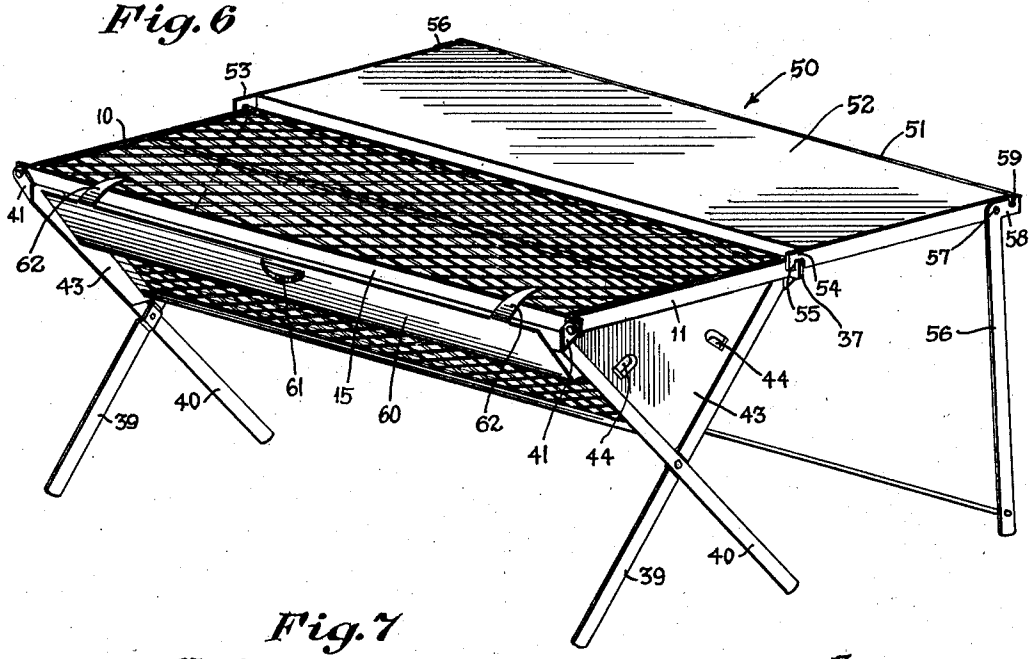

Fig. 7

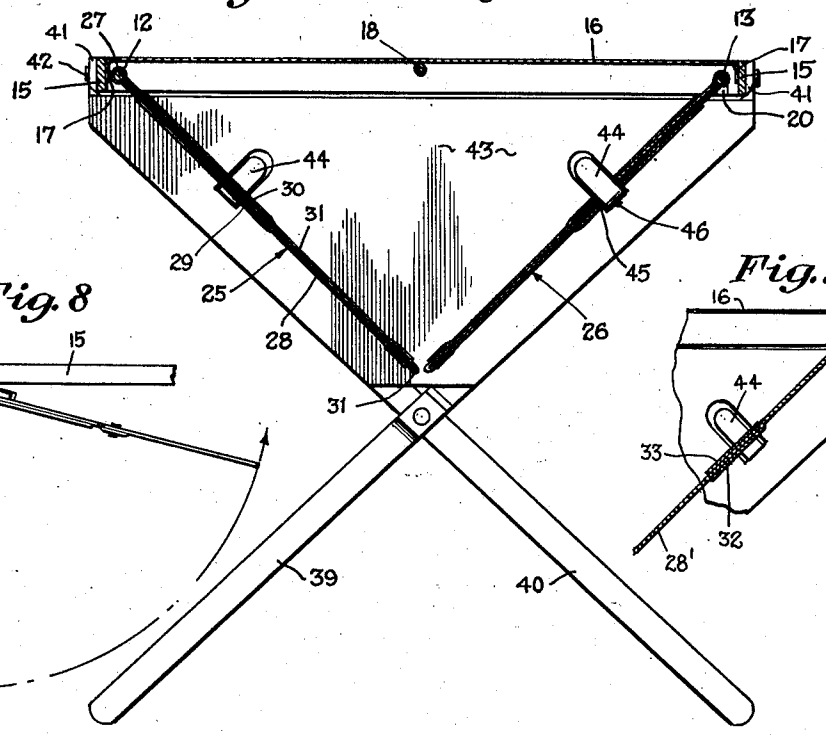

Fig. 8

Fig. 9

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CAMP STOVE

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13 Claims. (Cl. 126—29)

This invention relates to camp stoves and the like equipment, and, more particularly, to a collapsible and readily foldable device which can be conveniently stored in compact form.

At the present time there is a growing tendency toward spending leisure time in the outdoors. This usually takes the form of automobile trips or picnics during which meals are prepared out of doors either in public parks or at other camping facilities which are many times not provided with permanent fireplaces. It is desirable, therefore, to carry a stove as part of the equipment for such trips. Because storage space in the luggage or other storage compartment is usually taken up with traveling bags or other camping equipment, the stove should be collapsible so as to require a minimum amount of space.

An object of the present invention is to provide a foldable camp stove or the like which can be compactly folded or stored in a small space and which is equipped with foldable accessories which facilitate the preparation of meals on the stove.

This object is attained by providing a frame-like member to which all of the elements of a stove, which are all substantially flat, are pivotally mounted, and are movable into face-to-face relation to form a thin compact unit.

Preferably, the stove comprises a grid pivotally mounted to extend across the frame-like member and upon which food can be cooked. Disposed below the grid are a pair of side walls which are pivoted at their upper edges to the frame-like member and have their free lower edges disposed adjacent one another to form a trough-like firebox for receiving wood, charcoal, or other fuel. The side walls, being movable about the upper edges, are foldable into nested relation with the undersurface of the grid, when collapsed.

The grid and firebox of the present invention are supported at a suitable distance above the ground to permit the fire to burn properly and place the grid at a convenient height by end members which include legs or other supporting means. The end members are pivoted to the frame by means of offset hinges so as to move about their upper edges and into engagement with the upper surface of the grid. The end members can be provided with walls which, when moved into operative relation with the side walls, will substantially close the ends of the firebox.

With the side plates folded into engagement with one face of the grid and the end members into engagement with the other face of the grid, a very thin, flat and compact assemblage is obtained which can be readily stored in small spaces in the luggage or other storage compartment.

When the stove is unfolded, means are provided for engaging and holding the side walls in proper position to form a firebox and for holding the end members against movement about their pivots and in proper position to support the grid. In the preferred form of the invention, this comprises interengaging means on the side walls and end members, which, when moved into engagement, hold the walls in interlocked relation against movement about their pivots and provides a rugged and easily operated device.

When food is to be cooked, it is often difficult to find a place upon which it can be spread during its preparation for cooking. Accordingly, the present invention provides a novel table unit adapted to be mounted in conjunction with the grill or stove so as to have one side supported thereby. The other side of the table is provided with a pair of foldable legs for supporting the table top in substantially the same plane as the top of the grid. This will afford ample space for preparing the meats or other material to be cooked on the grill. When the table is folded, it can be readily nested with the folded stove for storage.

A further accessory, which is now essential with the advent of toasted sandwiches, comprises a means carried by the grill and disposed adjacent the firebox for receiving bread or the like for toasting. Preferably, this comprises a rack suspended from the grid or frame so as to be adjacent the portion of the firebox carrying the hot coals, whereby the intense heat will quickly brown the bread to the desired extent.

Another problem encountered in foldable stoves or grills is that of cooling the parts thereof after it has been used. According to the present invention, the grid and parts of the side walls which support the fire in the firebox are formed of expanded metal sheets which have a minimum mass and do not unduly retain the heat so that they cool very rapidly after use and permit the grill to be stored quickly after the meal has been prepared. Furthermore, the use of the expanded metal in the side walls affords an ample draft for the burning of wood, charcoal or other fuel used with the grill.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the drawings, in which:

Figure 1 is a perspective view of the camp stove.

Fig. 2 is a side elevational view of the camp stove.

Fig. 3 is an end elevational view of the camp stove.

Fig. 4 is a fragmentary transverse sectional view, showing the position of the side plates when moving to folded relation.

Fig. 5 shows a side view of the device with the side plates in folded relation and the end plates movable into engagement with the upper surface of the grid from the dot-and-dash position shown therein.

Fig. 6 shows an assembled view of the camp stove, table and toasting device.

Fig. 7 shows a transverse sectional view of the camp stove broken away to show the interengaging means.

Fig. 8 shows another form of mounting the end member.

Fig. 9 shows another form of side wall and mounting therefor.

As illustrated in the drawings, the foldable camp stove of the present invention comprises a pair of end brackets 10, 11 having their ends connected by a pair of rods 12, 13 so as to form a substantially rectangular frame.

A grid 14 is pivotally mounted so as to extend across the frame. In the preferred form of the invention, as shown in Fig. 7, the grid comprises a frame 15 of band-like material adapted to be disposed within the rectangular frame, and is provided with a supporting surface of expanded metal 16 extending thereover and secured in place by having the edges 17 thereof bent inwardly to engage the inner surface of the band-like frame to be welded thereto.

The supporting surface is braced and prevented from sagging by means of a rod 18 or other bracing means secured to the frame and engaging the center of the underface of the supporting surface as shown in Fig. 7.

The end walls of the band-like frame of the grid are provided with aligned openings adjacent one side thereof for receiving the rod 12 so that the grid pivots about the rod, and a pair of aligned slots 20 are formed in the end walls adjacent the other side of the grid so as to receive the rod 13 and hold the grid against shifting. If desired, suitable means can be provided in the form of a handle or tool for moving the grid about its pivot into an open position.

The firebox for the stove is formed by a pair of side walls 25, 26 disposed below the grid. Preferably, the side walls are hinged at their upper edges to pivot about the rods 12, 13. While the side walls can be formed of any suitable construction, in the preferred form of the invention they comprise a sheet of metal folded at 27 to form a hinge to be disposed around the rods and have a sheet of expanded metal 28 secured thereto. In the illustrated form of the invention, the body of the hinge extends across a portion of the side and has positioned between the sides 29, 30 thereof, at the open end, the strip of expanded metal which is clamped by the sides of the hinge and held in place. The strip of expanded metal extends for the remainder of the width of the wall to the free edge thereof. The exposed edges of the expanded metal are preferably covered by a thin metal band 31 folded thereover.

Another form of side wall construction is shown in Fig. 9, in which the hinge plate comprises a strip of sheet metal having its upper edge folded over as at 27' and provided at its lower edge with an offset section 32 which is adapted to form a pocket to receive, in overlapped relation, a portion of the expanded metal sheet 28' which forms the remainder of the wall. A strip of metal 33 overlies the overlapped portion of the expanded metal and hinge plate and the overlapped portions are secured together by welding or the like.

In assembling the side wall of this form of the invention, it is merely necessary to make up the side wall by assembling the hinge plate, sheet of expanded metal and metal strip and securing them together. The bent over edge is then positioned around the rods 12 or 13 and crimped into engagement therewith so that it is pivotally movable about the rod as in the previously described form of the invention.

The two side walls are so disposed with respect to the frame that, when their free ends are adjacent one another, they form a trough-like firebox as shown in Figs. 1 and 7 and the expanded metal forms suitable draft openings therefor. The amount of draft is controlled by the amount to which the sides of the hinge plate extend over the side walls. The closed top of the side walls not only controls the draft but also prevents cold air from circulating under the grid and interfering with the cooking.

It is to be understood that, if desired, the side walls can be entirely of expanded metal, and a shield provided for controlling the draft.

The grid is supported at a suitable height above the ground by a pair of end members 35, 36, which are pivotally mounted to the brackets 10, 11 so as to move about the upper edge thereof. In the preferred form of the invention, the brackets are provided at their ends with outwardly projecting lugs 37, 38, and each end member is formed by a pair of crossed legs 39, 40, secured together at a point intermediate the ends. The upper ends of the legs are bent through a 90° angle along a line extending at an angle transversely of the leg so as to provide a pair of offset hinges 41 for engaging the sides of the lugs 37, 38 and receiving pivot pins 42 carried thereby as shown in Figs. 2 and 7. The end members, when moved about the pivots from the supporting position through a reflex angle of substantially 270° as shown in Fig. 5, will move into contact with the upper surface of the grid.

If desired, the end members can be provided with an end plate 43 which, when the end members are in supporting position, will close the ends of the firebox.

In order to hold the stove in extended position, suitable means must be provided for limiting the movement of the side walls and end members about their pivots. While this may comprise separate securing means for holding each of the walls in place, the present preferred form of holding means comprises a novel means formed by interengaging elements on the end walls and side walls. As shown in Figs. 1 and 7, each of the end walls 43 has lanced and struck therefrom a pair of ears or tongues 44 disposed at an angle to the top so as to be tangent to or extend along an arc of a circle having the rods 12, 13 as centers. Each of the side walls is provided with a slot 45, as shown in Fig. 2, for receiving the tongues when the end walls are moved about their pivots and are in extended position.

The portion 46 of the tongue of this novel interengaging means provides a stop for limiting the downward movement of the side walls about their pivots so that they form the firebox as shown in Fig. 7. The weight of the sides tend to maintain the side walls against the stop and

keep the slots and tongue in interlocked relation. The slots, being normally interlocked with the upstanding portion of the tongue, will hold the ends from moving outwardly about the pivots, and will form a very stable construction.

As will be noted from Fig. 7, the rods 12, 13 about which the side walls and grid pivot, and the pivots 42 for the end members are all disposed in substantially the same plane, with the axes, about which the side and end walls pivot, being disposed at right angles to one another. This enables the side walls and the end walls to be moved into compact relation with the grid. As shown in Fig. 4, the side walls will be moved through an angle of less than 90° into nested relation and into face-to-face engagement with the undersurface of the grid, and, as shown in Fig. 5, the end members will be folded into flat face-to-face engagement with the upper surface of the grid through an angle of more than 180°, all moving about pivots in the same plane and without interfering with one another so that a very thin and compact device is present when folded.

In another form of end construction, one end being shown in Fig. 8, the lugs 37' on the end brackets 11' are folded back so as to be in parallel relation to the sides of the grid frame. The hinges 41' are formed on the legs and are turned in the reverse direction to that described in the previous form of the invention and receive the pivot pins 42'. The legs, as now mounted, are limited in moving to supporting position so as to be at right angles to the grid, as shown in dotted position in Fig. 8.

When it is desired to fold the camp stove of the present invention, using this type of end member, the side walls are folded into engagement with the undersurface of the grid and the end walls are then folded as indicated by the arrow into engagement with the undersurface of the side walls. With all of the walls pivoting about pivots extending in the same horizontal plane, a very thin and compact structure will be formed.

When it is desired to set up the stove incorporating this form of end wall, it is merely necessary to grasp the end stove by the end brackets and permit the end members to pivot into the dotted position as shown in Fig. 8, at which time the side walls will be released and dropped into proper position with the slots engaging the tongues on the end walls and holding the unit in extended relation.

In either form of the invention, the stove can be very readily set up by first moving the end members about their pivots and disposing the tongues in the path of movement of the side walls, and then moving the side walls so that the holes in the side walls engage the tongues and become interlocked therewith. The tongues will automatically hold the side walls in proper position to form the firebox. The grid is then raised by the handle or suitable tool, and the fuel placed in the firebox and ignited.

After the stove has been used, it can be soon stored away inasmuch as the portion of the side walls supporting the fire and the grid disposed over the fire are made of expanded metal having considerably less mass than would solid material so that it cools very rapidly, and enables the grid to be handled for storage.

If desired, the device may be rust-proofed in any suitable manner to prevent the metal from rusting during use in damp places or during storage.

When cooking in the out-of-doors, it is desirable that some means be provided upon which the food to be cooked can be prepared. According to the present invention, a foldable table 50 is combined with the stove for this purpose. As shown in the drawings, the table comprises a rectangular frame 51 having a top 52 thereon. A pair of lugs 53, 54 on the frame project beyond one side thereof, as shown in Fig. 6, and are provided with notches 55 in their undersurface adapted to engage and rest on the outstanding lugs 37, 38 of the brackets 10, 11 at the ends of the stove to be supported thereby. The other side of the frame is supported by a pair of legs 56, one at each end, pivoted to the frame at 57 and having a portion 58 thereof engaging a stop pin 59 when moved into extended position to properly locate and support the table in a plane which is a substantial continuation of the surface of the grid.

While the table has been shown as being disposed along the side of the grill, it is to be understood that the table can also be arranged to form a longitudinal extension of the grill by placing the lugs at the end of the table to engage the brackets on the stove to be supported thereby.

When the table is collapsed, it will fit over the folded grill so that it adds merely the thickness of the table to the already compactly folded grill, and can be readily stored therewith.

With the advent of toasted sandwiches, means have been required for the toasting bread to be used, either before or after the filling has been placed therein. While the bread may be placed on the top of the grid, the heat is usually not sufficient to properly toast the bread, but will dry it out before it has become sufficiently brown.

According to the present invention, a novel rack 60 is provided for supporting the bread adjacent the side wall of the firebox and near the point where the embers of the fire are disposed, so that the intense heat found there will quickly brown the surface of the bread to the desired extent without unduly drying and hardening the bread.

In the illustrated form of the invention, the rack is provided with a handle 61 whereby it can be readily manipulated for the insertion and removal of the bread. The rack is suspended from the grid or frame by means of a pair of arms 62 extending therefrom and into engagement with the frame or grid, and has the center of gravity so disposed that it swings about the arms and into engagement with the side walls of the stove.

This accessory can be nested over the edge of the folded stove so that it does not unduly enlarge the same, and can be readily stored therewith.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

We claim:

1. A foldable camp stove or the like comprising a substantially rectangular frame; a grid pivotally mounted to extend over the frame; side walls pivoted to the opposite sides of the frame and adapted to form a firebox beneath the grid; and end members pivoted to the opposite ends of the frame adapted to close the end of the firebox and having supporting means for supporting the firebox above the ground.

2. In a foldable camp stove, a grid; side plates

pivoted at opposite sides of the grid and movable into a position to form a firebox disposed beneath the grid; end walls pivotally mounted at opposite ends of the grid and movable to complete the firebox; and lugs formed on the end walls for engaging the side walls and limiting the pivotal movement thereof whereby a trough-shape firebox is formed.

3. In a foldable camp stove, a grid; a pair of side plates; means for pivotally mounting the plates at the upper edges thereof; and means for holding the free lower edges of the side walls in predetermined relation to one another to form a trough-like firebox disposed beneath the grid, said side walls being foldable into overlapping relation and into engagement with the undersurface of the grid when collapsed.

4. In a foldable grill, a grid; a pair of pivotally mounted side walls adapted to form a firebox; and a pair of pivoted ends adapted to close the firebox and provided with means for supporting the grid in proper relation to the ground, the sides being movable into engagement with one face of the grid and the ends movable into engagement with the other face of the grid when the device is folded into inoperative position.

5. A folding camp stove comprising a grid; end members pivoted about their upper edges for supporting the grid; and means for holding the end members against movement about the pivots, the end members including legs having their upper ends bent over at right angles to form offset hinges for receiving the pivot means.

6. In a foldable camp stove, the combination of a grid; a pair of pivotally mounted side walls forming a firebox disposed below the grid; and a pair of pivotally mounted end members for closing the firebox and supporting the firebox and grid, the side members moving through an angle less than 90° into engagement with one side of the grid and the end members moving through an angle greater than 180° and into engagement with the other side of the grid when the stove is folded into collapsed condition.

7. In a device of the class described, a pair of end brackets; a pair of rods interconnecting the ends of the brackets; a pair of side walls comprising a hinge plate and a plate of expanded metal pivotally mounted on the rods to extend the full length thereof and form a firebox with the expanded metal portion of the side walls forming draft openings therein; and a pair of end walls pivotally mounted on the brackets to pivot about a horizontal axis and close the end of the firebox.

8. A foldable camp stove or the like comprising a substantially rectangular frame; a grid pivotally mounted to extend over the frame; side walls pivoted to the opposite sides of the frame and adapted to form a firebox for receiving fuel; and end walls pivoted to the opposite ends of the frame and adapted to close the end of the firebox and to support the firebox above the ground, the pivots for the grid, the end walls and side walls being in substantially the same horizontal plane.

9. A foldable camp stove or the like comprisa substantially rectangular frame; a grid of expanded metal pivotally mounted to extend over the frame; side walls pivoted to the opposite sides of the frame and adapted to form a firebox beneath the grid, at least a portion of the side walls being formed of expanded metal to provide draft openings; and end members hingedly mounted at the opposite ends of the frame and adapted to close the firebox and support the grid.

10. In a device of the class described, a pair of end brackets; a pair of rods interconnecting the ends of the end brackets to form a frame; a grid pivotally mounted adjacent the ends of one of the rods for movement into a position covering the frame; a pair of side walls pivotally mounted on the rods to extend the full length thereof and form a firebox beneath the grid; and a pair of end walls pivotally mounted on the brackets to pivot about a horizontal axis.

11. In a foldable camp stove, a grid; side plates pivoted at opposite sides of the grid and movable into a position to form a firebox disposed beneath the grid; end walls pivotally mounted at opposite ends of the grid and movable to complete the firebox; and interengaging means on the end walls and side walls for holding the walls in extended position against movement about the pivots, said interengaging means comprising an ear lanced from the end wall and a slot in the side wall.

12. In a foldable grill, a grid comprising a rectangular frame of metal and a sheet of expanded metal extending thereacross and provided with downwardly extending flanges secured to the sides of the frame; side walls pivoted at their upper edges and having a major portion thereof of expanded metal; means for holding the free lower edges of the side wall in predetermined relation to form a firebox under the grid, the expanded metal members comprising a major portion of the body and having such mass as they will cool quickly after use.

13. In a device of the class described, a pair of end brackets; a pair of rods interconnecting the ends of the end brackets to form a frame; a grid pivotolly mounted on one of the rods for movement into a position overlying the frame; a pair of side walls pivotally mounted on the rods to extend the full length thereof and adapted to form a trough-like firebox when in extended position; and a pair of end walls pivotally mounted on the bracket to pivot about a horizontal axis and adapted to close the end of the trough to complete the firebox when in extended position, said sides moving through an acute angle into engagement with one surface of the grid when folded and the ends being movable through a reflex angle into engagement with the other side of the grid when folded.

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