The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

My invention relates to collapsible heaters. A primary object of the invention is to provide a small size heater for use in the field by military personnel, and the like, for heating cans of individual rations, the heater being foldable into an extremely compact condition when not in use, so that it may readily be carried in a soldier's pack, coat pocket, or the like.

A further object is to provide a heater of the above-mentioned type having built-in ration can supporting and heating means which are shiftable to enclosed positions within the body portion of the heater, when the same is collapsed or folded.

A further object is to provide in a heater of the above-mentioned character, a can support or baffle which prevents the flame from directly contacting the ration can and burning or scorching the rations.

Still further objects are to provide a ration heater which is highly simplified in construction, compact, sturdy and reliable, in operation and quite inexpensive to manufacture.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a perspective view of a collapsible heater embodying my invention, and showing the same in use for heating a can of rations.

Figure 2 is a perspective view of the heater in the collapsed or folded condition.

Figure 3 is a plan view on an enlarged scale of the folded heater.

Figure 4 is a plan view on a somewhat reduced scale of the heater in the extended or open position.

Figure 5 is a vertical cross section taken on line 5—5 of Figure 4.

Figure 6 is a similar section taken on line 6—6 of Figure 4, and,

Figure 7 is a vertical section on line 7—7 of Figure 3, and drawn on a reduced scale.

In the drawings, where for the purpose of illustration is shown a preferred embodiment of my invention, the numerals 10, 11 and 12 designate three side walls or panels which form the body portion of my heater. These side walls 10, 11 and 12 are similar in construction, and each side wall is rectangular, and flat over the major portion of its area. The side walls 10, 11 and 12 are preferably formed of sheet metal of sufficiently heavy gauge to render the heater substantially rigid.

Each of the side walls 10, 11 and 12 has its opposite ends bent to provide relatively short inclined integral extensions 13, extending for the entire height of the side wall and projecting laterally inwardly thereof. The extensions 13 of the intermediate side wall 11 are hinged near their respective top and bottom ends to the inner extensions 13 of the side walls 10 and 12 by hinges 14, preferably formed from the material of the side walls 10, 11 and 12. The arrangement is such that the three hingedly connected side walls or panels of the heater may be arranged to form a generally triangular upright body portion or housing as shown in Figures 1 and 4. The hinged side walls are also swingable to the collapsed or folded positions shown clearly in Figures 2 and 3. The ends of the side walls 10 and 12 remote from the intermediate side wall 11 are not hingedly connected, but freely disposed, so that the heater may be folded and unfolded, as shown. When in the collapsed condition, the side walls 10, 11 and 12 assume the relative positions shown in Figure 3 and are substantially parallel. The lateral extensions 13 maintain the side walls 10 and 11 spaced apart somewhat, and the side wall 12 lies closely adjacent to the outer surface of the side wall 10, Figure 3. When in the collapsed condition, the side walls 10, 11 and 12 form a narrow flat housing or enclosure, and the entire assembly may be conveniently carried in a coat pocket, soldier's pack, or the like.

A shallow circular holder or pan 15 is provided for holding a small quantity of liquid fuel such as gasoline or a suitable tablet saturated with liquid fuel. The pan 15 is rigidly secured to and carried by a short radial arm 16, hingedly secured at 17 to the side wall 10. At its outer end, the arm 16 is bent downwardly 90 degrees to form an integral depending tab or stop 18, adapted to engage the side wall 10 below the hinge 17 and prevent the pan 15 from swinging below horizontal, Figure 8. The pan 15 is freely swingable upwardly to the position shown in Figures 3 and 7, when the heater is collapsed. When the pan 15 is in the operative horizontal position as shown in Figures 4 and 5, it is spaced slightly above the lower ends of the side walls, and the hinge 17 is disposed at the longitudinal center of
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the side wall 10. The pan is spaced equidistantly from the three side walls 10, 11 and 12 when the heater is in the operative position, Figure 4.

A substantially flat support plate or baffle 19 is rigidly secured to and carried by the pan L-shaped arm 20, hingedly secured at 21 to the side wall 11, Figures 4 and 6. The outer depending extension 22 of the L-shaped arm 20 constitutes a stop for engagement with the side wall 11, below the hinge 21, and prevents the support plate 19 from swinging below the horizontal, while permitting the same to swing freely upwardly to the inoperative or stowed position. The support plate 19 when in the operative horizontal position is spaced a slight distance above the pan 15 in parallel superposed relation therewith. The support plate is provided near one corner thereof with a depending tab or leg 23, rigidly secured thereto, which rests upon the hinge 17, close to the side wall 10, to further firmly support the plate 19, which bears the weight of the ration can. The hinge 21 is spaced above the hinge 11, and secured to the same in an extended center of the same, Figure 4.

The support plate 19 has curved side edges 24 which engage the side walls 10 and 12 to limit their movement toward each other, and positively position the three side walls to form the triangular housing or body portion. The support plate 19 is centrally located with respect to the side walls 10, 11 and 12 and concentric with the circular fuel pan 15, which is smaller in diameter than the support plate 19, as shown. The support plate is provided with three equidistantly spaced upstanding projections or lugs 25, preferably stamped out of the material of the support plate. These lugs 25 engage the bottom of the ration can to hold the same spaced slightly above the top surface of the support plate, and the lugs also aid in positioning the can centrally upon the support plate. In addition to its function as a support for the ration can, the plate 19 constitutes a flame baffle which prevents the flame from the fuel pan 15 from impinging directly upon the bottom of the ration can, which might result in the burning of contents.

The support plate 19 is cut off for forming a forward straight edge 26 which lies adjacent to the top edge of the side wall 11, Figure 7, when the heater is in the folded condition. When the heater is folded, no parts of the pan 15 or support plate 19 project outside of the narrow housing formed by the side walls 10, 11 and 12.

The side walls 10, 11 and 12 are provided near and above their lower ends and adjacent to the fuel pan 15 with horizontal rows of spaced air-inlets openings 27 which permit air to enter the lower end of the triangular housing, and circulate upwardly through the triangular housing for forming a natural updraft to support combustion. The side walls 10, 11 and 12 extend a substantial distance above the support plate 19, when the side wall is disposed horizontally so that the ration can resting upon the support plate is substantially enclosed by the three side walls as shown in Figure 1. The top end of the triangular housing is open, so that the ration can be readily placed in and removed from the heater.

Means are provided to releasably lock the side walls 10, 11 and 12 in their extended and folded positions. Such means comprises a spring tab or latch element 27, rigidly secured in any preferred manner to the free extension 13 of the side wall 12, and disposed at the vertical center of the side wall 12. The side wall 10 is provided in its free extension 13 with an aperture 28, adapted to receive an inwardly offset projection or detent 29 of the latch element 27. The arrangement is such that when the side walls 10 and 12 are carried by the L-shaped arm 20, hingedly secured at 21 to the side wall 11, Figures 4 and 6, wherein they contact the curved edges 24 of the support plate 19, the detent 29 snaps into the aperture 28 and releasably secures the side walls in their triangular relationship, forming the housing or body portion of the heater.

The heater is collapsed or folded for storage in a pocket, soldier's pack or the like, the support plate 19 is first swung upwardly against the inner surface of the side wall 11, and the fuel pan 15 is likewise swung upwardly against the side wall 10. The side wall 10 is then swung toward the side wall 11, until it assumes substantially the position shown in Figure 3, and finally the side wall 12 is folded over the side wall 10 and disposed exteriorly thereof. When this is done, the detent 29 will snap into the narrow space 30 between the hinged extensions 13 of the side walls 10 and 11, and the latch element 27 now serves to releasably secure the three side walls in their folded substantially parallel positions.

The lateral extensions 13 of the three side walls serve to maintain the side walls 10 and 11 spaced apart sufficiently to accommodate the fuel pan 15 and support plate 19, when these elements are swung to their positions between the side walls as shown in Figures 2 and 3. However, the space between the folded side walls 10 and 11 is relatively narrow so that when the support plate 19 and pan 15 have assumed their positions shown in Figures 2 and 3, they cannot again swing downwardly to their horizontal positions, until the side walls have been opened and assume the triangular relationship shown in Figures 1 and 4.

As previously stated, the side walls 10, 11 and 12 are preferably formed of sheet metal, and the other components of the heater, namely the fuel pan 15 and support plate 19 may likewise be formed of sheet metal of a suitable thickness to provide the desired rigidity and strength to the heater.

The heater is highly compact and simplified in construction, extremely easy to operate and occupies a minimum space within a soldier's pack or the like. When in the collapsed position shown in Figure 2, the heater may be conveniently placed in a coat pocket or the like.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:

1. A collapsible heater comprising three hingedly connected side walls adapted to be positioned to form an upstanding generally triangular housing, the side walls having relatively short lateral extensions at their ends, a fuel pan hingedly secured to one side wall and adapted to extend substantially horizontally while enclosed by the side walls, and swingable upwardly to lie next to the side wall to which it is hingedly secured by a support plate hingedly secured to another of said side walls above said fuel pan and adapted to extend substantially horizontally above the fuel pan while enclosed by the side walls and swingable upwardly to lie next to the side wall to
which it is secured, the hinged side walls being shiftable to substantially parallel positions wherein they are spaced apart by said lateral extensions provided at opposite ends, the relatively fuel pan and support plate when the latter are lying next to the side walls to which they are secured.

2. A foldable heater comprising a body portion including a plurality of hingedly connected panels provided at opposite ends with relatively short lateral extensions, the outer ends of the endmost pair of the panels being free from permanent connection and adapted to be brought together for forming an upright enclosure open at the top, a fuel pan hingedly secured to one panel near the lower end of the same, stop means connected with the fuel pan to prevent the same from moving below a substantially horizontal position when the panels are upright, the fuel pan being foldable upon the panel carrying it, a support plate hingedly secured to a second of said panels at an elevation above the fuel pan and spaced a substantial distance below the tops of the panels, stop means connected with the support plate to prevent the same from moving below a substantially horizontal position when the panels are upright, the support plate being foldable upon the panel carrying it, a fuel pan hingedly secured to a second of the panels at an elevation near and above the fuel pan and adapted to extend inwardly of said wall section for disposition centrally within the triangular enclosure, a support plate hingedly secured to one wall section near the lower end of the same and adapted to extend inwardly of such wall section for disposition centrally within the triangular enclosure, and a latch element carried by one endwall section and engaging the other endwall section to releasably hold the three wall sections in their positions forming the substantially triangular enclosure.

5. A foldable heater for individual rations comprising three hingedly connected wall sections provided at their ends with lateral extensions, corresponding ends of the endmost wall sections being free from permanent connection and foldable over the intermediate wall section to form a substantially flat narrow housing, the wall sections being shiftable to positions forming a substantially triangular upright housing, a fuel pan hingedly secured to one wall section near the lower end of the same and adapted to extend inwardly of such wall section for disposition centrally within the triangular housing, the fuel pan then being spaced from the three wall sections, a support plate hingedly secured to another of said wall sections at an elevation near and above the fuel pan and adapted to extend inwardly of the last-named wall section for disposition centrally within the triangular housing, the support plate being of a larger area than the fuel pan and having marginal edges which contact the endmost wall sections for limiting their movement toward each other, a depending leg carried by the support plate and engaging upon the fuel pan to rigidly support the support plate while the same extends over the fuel pan, and a latch element carried by one endmost wall section and extending beyond the outermost end of such wall section, the other endmost wall section being provided near its outermost end with an opening receiving the latch element for releasably securing the wall sections in their positions forming the triangular housing, the latch element engaging the inner end of the last-named endwall section when the endmost wall sections are folded over the intermediate wall section and thereby releasably holding the wall sections in their positions forming the flat narrow housing.

6. A foldable heater for individual ration cans comprising a body portion including a plurality of hingedly connected panels provided at opposite ends with relatively short lateral extensions, the outer ends of the endmost panels being free from permanent connection and adapted to be brought together for forming an upright enclosure having its top open, the panels being provided near their bottom ends with openings through which air enters the upright enclosure to aid combustion, a fuel pan hingedly secured to one panel at substantially the elevation of said openings, a depending stop element secured to the fuel pan and engaging the panel to which the fuel pan is secured and preventing the fuel pan from moving below a substantially horizontal position when the panels are upright, the fuel pan being foldable upon the panel to which it is secured, a support plate hingedly secured to a second of the panels at an elevation near and above the fuel pan and spaced a substantial dis-
tance below the tops of the panels, a depending leg secured to the support plate for engaging the fuel pan to prevent the support plate from moving below a substantially horizontal position when the panels are upright, the support plate being foldable upon the panel to which it is secured, the panels being foldable to substantially parallel positions wherein they are spaced apart by said short lateral extensions of a pair of the panels and forming a narrow substantially flat housing for the fuel pan and support plate, and a latch element carried by one endmost panel for engagement with the other endmost panel to releasably secure the panels in their folded and extended positions.

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