Oct. 11, 1932. W. NAGLE 1,882,159

STOVE

Filed Jan. 8, 1930 2 Sheets-Sheet 1

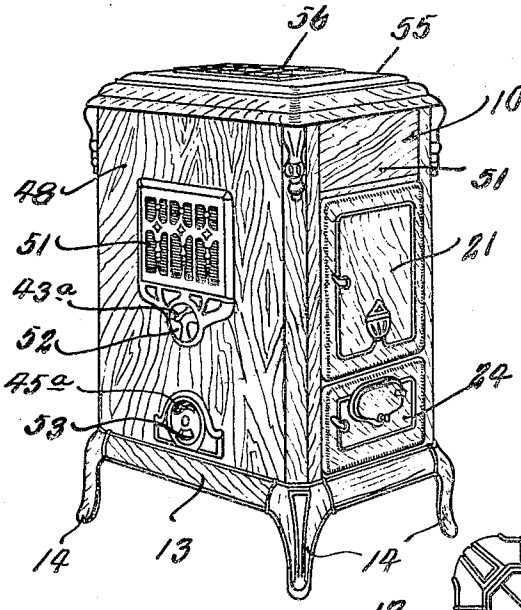


Fig. 1

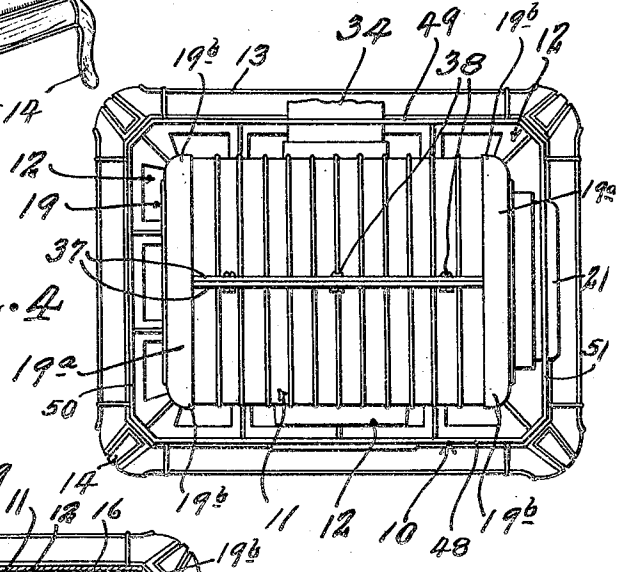


Fig. 4

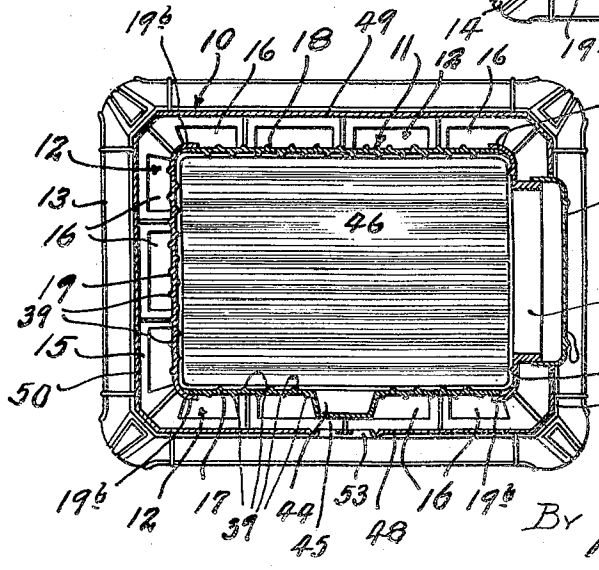


Fig. 5

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Fig. 2

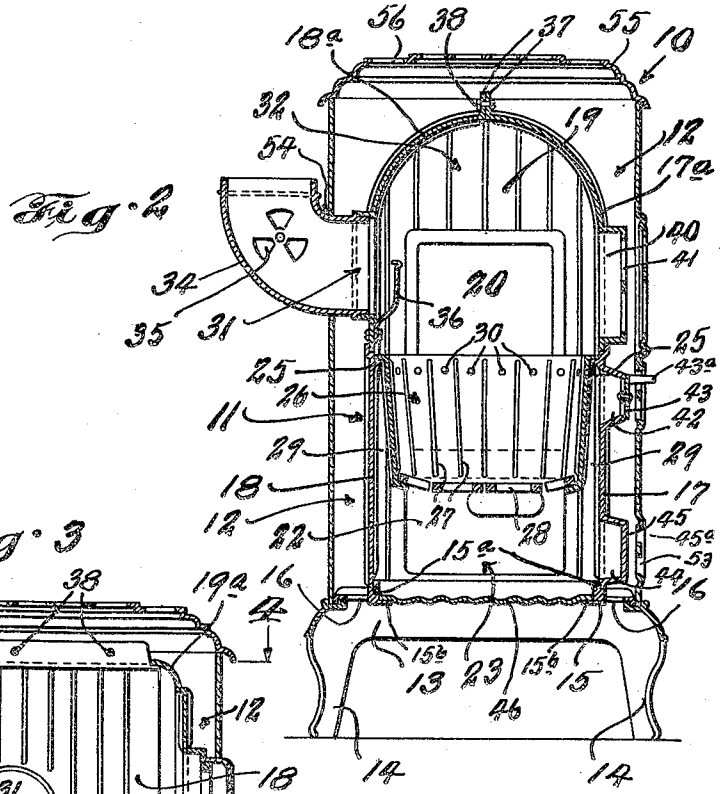
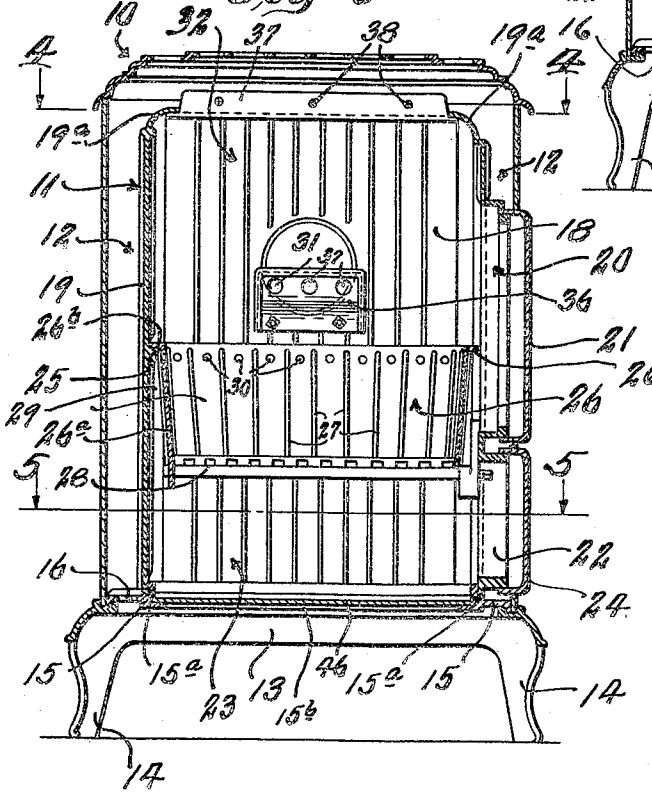


Fig. 3



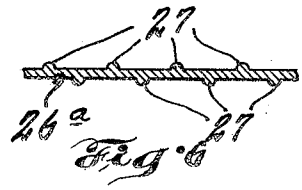


Fig. 6

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UNITED STATES PATENT OFFICE

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STOVE

Application filed January 8, 1930. Serial No. 419,285.

This invention relates to new and useful improvements in portable heating stoves of the type having an ornamental outer casing or unit and an inner unit spaced from the first unit so as to provide air circulating passages therebetween.

The objects of the present invention are to provide an inner unit having a comparatively large combustion chamber provided with a dome top and having the flue outlet disposed on a horizontal plane below said dome top so as to allow gases collected therein to be consumed before reaching said flue outlet.

Other objects of the invention are to provide a portable heater having a sectional fire box insertable into the fire chamber of the inner unit in spaced relation with the walls of the latter, said fire box being provided above the fire level with a plurality of air openings through which heated air is admitted from between the spaced walls to the combustion chamber to facilitate the combustion of gases and smoke therein.

Further objects of the invention are to provide a portable heating stove of air circulating type wherein the fire box and the grates are removable from said inner section through the fire door.

Still further objects of the invention are to provide a portable heating stove, the inner unit of which is provided with a heavy bottom wall section whereby the fire box section and the grate can be removed and the stove used for burning wood.

Additional objects of the invention are to provide a portable heating stove of air circulating type comprising an outer ornamental unit and an inner combustion unit, said units being arranged in spaced relation to provide air circulating passages, the walls of the inner unit being formed sectional and being provided on opposite sides with ribs arranged in staggered relation to reinforce said wall sections and to prevent warpage and breakage and permit the use of comparatively thin walls, thereby increasing the radiation capacity thereof.

With these and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my improved portable stove.

Figure 2 is a vertical cross section taken through the same.

Figure 3 is a vertical cross section taken at right angles to Figure 2.

Figure 4 is a horizontal cross section taken on line 4—4 of Figure 3.

Figure 5 is a horizontal cross section taken on line 5—5 of Figure 3.

Figure 6 is an enlarged detail cross section of one of the ribbed sections.

The heating stove to which the present invention appertains is of the air circulating portable type having an outer ornamental unit or casing 10 and an inner or combustion unit 11. These units are spaced from each other to provide vertically disposed air chambers 12 in which the air is heated and rises upwardly.

The outer unit 10 is supported by a base 13 having legs 14 and the inner unit 11 is supported by a bottom frame 15, the outer edge of which rests on base 13. The bottom frame 15 is provided with a series of vertically disposed openings 16 through which air is admitted into the chambers 12.

The inner unit 11 consists of a front wall 17, a rear wall 18, and side walls 19. The lower edge of each of said walls rests in the outwardly and upwardly presented seat formed in the upwardly presented flange 15^a of base 15.

One of the side walls 19 is provided with a fire door opening 20 closed by a fire door 21 hinged on the corresponding wall of the outer unit 10. Below said fire door opening is formed a similar opening 22 which leads into the ashpit 23 of the inner unit and is closed by a door 24 also hinged on the respective side wall of the outer casing. The openings 20 and 22 are flanged, the flanges extending outwardly for engagement with the flanges of the respective doors so as to form an air tight closure.

Each wall 17, 18 and 19 is formed with an integral flange 25 which is disposed hori-

zontally and projects inwardly into said unit. Said flanges are arranged on a horizontal plane about halfway of the fire door opening 20. A fire box 26 is suspended from said flanges and extends downwardly a suitable distance above the frame 15. This fire box is preferably formed of sections so that each wall 26[a] is formed separate. The walls are provided with vertically disposed ribs 27 arranged on both sides of the walls and staggered so that the ribs of one side are disposed intermediate the ribs of the other side. This arrangement reinforces the fire box sections and also increases the radiation capacity thereof. The fire box is supported in position by means of horizontally and outwardly projecting flanges 26[b] which are formed integral with the upper edges of the walls of said fire box and rest upon the flanges 25 of the respective walls of the inner unit. The lower edges of said fire box support a grate 28 which is removable so that grates for use with different kinds of fuels can be used.

The walls of the fire box are spaced from the walls of the inner unit, being inclined downwardly and inwardly from their upper edges to provide air chambers 29. Each wall of the fire box is provided near its upper edge with a plurality of apertures 30 which connect the air chambers 29 with the combustion chamber immediately above the fire box. Thus air from the ashpit enters said chambers 29 and is heated therein and rises upwardly into the combustion chamber through air openings 30.

The combustion chamber is comparatively large and extends a suitable distance above the fire door opening 20 and also above the flue outlet 31. This flue outlet is located in the rear wall 18 substantially on a horizontal level with the upper half of the fire door opening 20 and below the dome portion 32 of the combustion chamber. An elbow 34 is attached to the flue outlet 31 and extends outwardly from the ornamental casing and is provided with a check draft 35. A baffle plate 36 is secured to the wall 18 immediately below the flue outlet 31 and extends upwardly about halfway of said outlet in spaced relation therewith. The purpose of this baffle plate is to prevent smoke and gases from passing directly from the fire box into said outlet. Preferably this baffle plate is provided with a plurality of openings 37.

The upper ends of front wall 17 and rear wall 18 are curved inwardly, as indicated at 17[a] and 18[a], respectively, to form the combustion chamber dome-shaped above said flue outlet and said fire door 20. The meeting edges of said curved portions are flanged as indicated at 37 and are provided with aligned apertures for receiving suitable bolt and nut securing means 38 by means of which said walls are secured together. The upper ends of side walls 19 are also curved as indicated at 19[a] and have their edges overlying the side edges of said front and rear walls. Similarly the vertical edges of walls 19 are curved as indicated at 19[b] and overlap the vertical edges of walls 17 and 18.

Each of side walls 17, 18 and 19 are provided on their opposite sides with vertically disposed ribs 39 arranged in staggered relation the same as ribs 27 of the fire box wall sections 26[a]. The use of these ribs permits side walls 17, 18 and 19 to be formed comparatively thin and at the same time reinforces said walls against warpage and breakage. Furthermore the outwardly projecting ribs increase the radiating surfaces of the inner unit.

The front wall 17 is provided above the fire box 26 with a box-like extension 40 having arranged in its front wall a series of openings 41 closed by mica so that the fire in the fire box is rendered visible through said openings. A smaller extension 42 is formed in said wall in horizontal plane with air chambers 29 and the front wall of said extension is provided with openings which are controlled by a draft check 43. This check has a projection 43[a] by means of which said check can be adjusted to regulate the admission of fresh air to said chambers 29.

A box-like extension 44 is formed in wall 17 below the fire box 26 and opens into the ashpit. This extension is provided with openings controlled by a draft check 45 having a projection 45[a] for adjustment. By means of this check the admission of fresh air to the fire box is controlled.

The base frame 15 is provided with a horizontally and inwardly projecting flange 15[b] on which is removably arranged a bottom wall plate 46 which forms the bottom for the ashpit. This plate is formed of comparatively heavy material and is corrugated for reinforcement purposes. The ashpit is of suitable size to receive a comparatively large ashpan 47 as shown in dotted lines in Figures 3 and 5.

When the heater is to be used as a wood stove, the ashpan and the fire box 26 are removed and the wood is placed directly on the bottom plate 46, which is made extra heavy especially for this purpose.

The inner unit 11 is completely enclosed by the outer casing 10 which is formed ornamental so as to present a neat appearance. This casing comprises a front wall 48, a rear wall 49, and side walls 50 and 51, respectively. The front wall 48 is provided with a grill opening 51 which is arranged adjacent to openings 41 and is slightly larger than the latter and is of suitable ornamental appearance so as to enhance the effect of the fire visible therethrough.

An opening 52 is arranged immediately below the opening 51 and preferably forms a

part of the ornamental design thereof. Projecting outwardly through this opening is the handle or projection 43ª whereby draft check 43 can be readily manipulated. An ornamental opening 53 is arranged in wall 48 adjacent to the draft check 45. Projection 45ª extends outwardly through this opening and permits manipulation of said ashpit draft check.

The rear wall 49 is provided with an opening 54 through which the elbow 34 is projected outwardly from said casing. Side wall 51 has hingedly mounted thereon fire door 21 and ashpit door 24 and is provided with suitable door openings for accommodating said doors. The lower edges of the walls 48, 49, 50 and 51 rest in the upwardly presented seats formed in the base 13 and the upper edges of said walls receive a top 55 which is of suitable ornamental design and is provided with a grill opening 56 through which the air heated during its passage upwardly between the walls of the outer casing 10 and inner unit 11 is discharged from the heater.

The cold air is admitted into the heater through openings 16 formed in base frame 15 and as said air comes in contact with the outer surfaces of walls 17, 18 and 19 it is heated and caused to rise upwardly and discharged into the room through the opening 56. Thus the natural circulation of air is set up in the room and the air is quickly and efficiently heated.

The inner unit 11 has its wall sections formed so as to provide a perfect joint so that no smoke or dust can enter from the combustion chamber into the air circulating passages. The top of the combustion chamber is formed dome shape and the flue outlet is arranged a suitable distance below the top so as to insure combustion of the gases in said dome-shaped top. In order to insure this combustion of gases fresh heated air is supplied to the combustion chamber from air chambers 29 through openings 30 which are arranged above the fire level. The supply of fresh air to air chambers 29 can be regulated by means of check draft 43. The arrangement of baffle plate 36 shuts off the lower half of the flue outlet from the fire box so that the hot smoke and hot gases cannot pass directly from the fire box into said flue but have to pass upwardly into the upper part of the combustion chamber before they discharge through the flue outlet.

I claim:

1. A portable heater comprising in combination a base provided with an upwardly presented marginal seat having upwardly extending inner and outer marginal flanges, a horizontally disposed bottom frame having its outer edge formed with a downwardly presented marginal flange resting in said seat in overlapping relation with the inner flange of said base, said bottom frame being provided with an upwardly presented flange spaced from its outer edge, an outer casing having its bottom edge resting in said seat in juxtaposed relation with the outer flange of said base and the downwardly presented flange of said bottom frame, said casing having a perforate top, an inner unit engaging the inner flange of said bottom frame and supported by the latter in spaced relation with said outer casing to provide a vertically disposed air chamber, the upper end of said inner unit being formed dome-shaped, said bottom frame being provided intermediate its flanges with a plurality of vertically disposed openings for admitting air into said chamber, the heated air being discharged through the perforate top of said outer casing, a fire box supported within said inner unit at a point a substantial distance from the upper dome-shaped end of said inner unit so as to provide a comparatively large combustion chamber therein, and a flue outlet leading from said combustion chamber at a point intermediate of said fire box and the upper end of said combustion chamber.

2. A portable heater comprising in combination a base frame having an upwardly presented marginal seat, a bottom frame arranged within said base frame and having a downwardly presented marginal flange disposed in said seat, an inner combustion unit mounted on said bottom frame, a fire-box removably supported within said inner unit and having its walls formed with internally and exteriorly projecting vertically disposed ribs arranged in staggered relation with each other, and an ornamental outer unit mounted on said base frame and enclosing said inner unit, the walls of said units being spaced from each other so as to form vertically disposed air chambers, said bottom frame being provided with openings connected with said air chambers and the top of said ornamental casing being perforate for discharging the hot air from said chambers.

3. A portable air circulating heater comprising in combination a base frame provided with an upwardly presented seat having spaced upwardly presented marginal walls, a bottom frame arranged within said base frame and having its outer edge terminating in a marginal flange presented downwardly and disposed in said seat in juxtaposed relation with the inner wall of said seat, said bottom frame being provided with a vertically disposed seat spaced from said marginal flange and with a horizontally disposed flange spaced inwardly from said vertically disposed seat to form a central opening, an inner combustion unit consisting of sectional walls having their lower edges seated in the seat of said bottom frame, an outer ornamental casing having its lower edges seated in the upwardly presented seat of said base

frame in juxtaposed relation with the outer wall of said seat and with the downwardly presented flange of said bottom frame, said outer casing being spaced from said inner unit to form a vertically disposed air chamber, said bottom frame being provided with openings leading into the lower end of said chamber and said outer casing being provided with a perforate top for discharging heated air therefrom, and a corrugated bottom wall removably arranged on the horizontally disposed flange of said bottom frame to provide a bottom for said inner unit.

4. A portable air circulating heater comprising in combination a base, a bottom frame removably supported by said base, an inner unit mounted on said bottom frame, an outer ornamental unit mounted on said base in spaced relation with said inner unit to provide vertically disposed air chambers, said outer unit completely enclosing said inner unit and being provided with a perforate top for discharging hot air from said chambers, said bottom being provided with openings leading into the lower ends of said air chambers, a fire box removably arranged in the combustion chamber of said inner unit in spaced relation with the walls thereof, said fire box being provided near its upper edge with a plurality of apertures so as to permit heated air to pass therethrough upwardly into the combustion chamber at a point above the fire level, the walls of said inner unit being provided with inwardly projecting horizontally disposed flanges and the upper edges of said fire box being formed with outwardly projecting horizontally disposed flanges for engaging the flanges of said inner unit, thereby supporting said fire-box in position, the upper end of said combustion chamber being dome-shaped and arranged a suitable distance above said fire box, a flue outlet leading outwardly from said combustion chamber above said fire box, and a baffle enclosing the lower half of said flue outlet and spaced laterally therefrom for obstructing the direct passage of gases and smoke from the fire box to said flue outlet whereby gases and fresh air are caused to collect in the dome-shaped top of said combustion chamber and are consumed before reaching said flue outlet.

5. In a portable air circulating heater, the combination of a base provided with legs and having an upwardly presented marginal seat having vertically and upwardly presented marginal walls, a bottom frame supported by said base, said bottom frame having its edge formed with a downwardly presented marginal flange and disposed in said seat in overlapping relation with the inner wall of the latter, an outer casing having its bottom edge resting in said seat between the outer wall thereof and the downwardly presented flange of said bottom frame, said bottom frame being provided with an upwardly presented flange spaced from the marginal flange thereof, the space between said flanges being provided with vertically disposed openings, an inner unit having its bottom edge resting on said bottom frame in juxtaposed relation with the inner flange thereof, thereby forming a vertically disposed chamber between said casing and said inner unit, the openings in said bottom frame forming inlet openings for said chamber and the upper end of said casing being perforate to form outlet openings for said chamber, said inner unit and said outer casing being formed with coinciding openings to provide access to said inner unit, and doors for closing said openings.

6. In a portable circulating heater of the class described, the combination of a base including legs and having a horizontally disposed upwardly presented marginal channel seat, a bottom frame supported by said base and having its outer edge terminating in a downwardly presented peripheral flange disposed in said seat in overlapping relation with the inner wall thereof, an outer casing extending upwardly from said base and having its bottom edge resting in said channel seat in juxtaposed relation with the peripheral flange of said bottom frame and with the outer wall of said seat, an upwardly presented seat formed in said bottom frame in spaced relation with the outer edge thereof, said seat including an upwardly presented flange, and an inner combustion unit having its bottom edge resting in the seat of said bottom frame in overlapping relation with the flange thereof and spaced from said casing to form a vertically disposed chamber, said bottom frame being provided intermediate its outer flange and its inner flange with a plurality of openings forming inlets for said chamber and said casing being provided with a perforate top forming outlets therefor.

In testimony whereof I hereunto affix my signature this 20th day of November, 1929.

WALTER NAGLE.