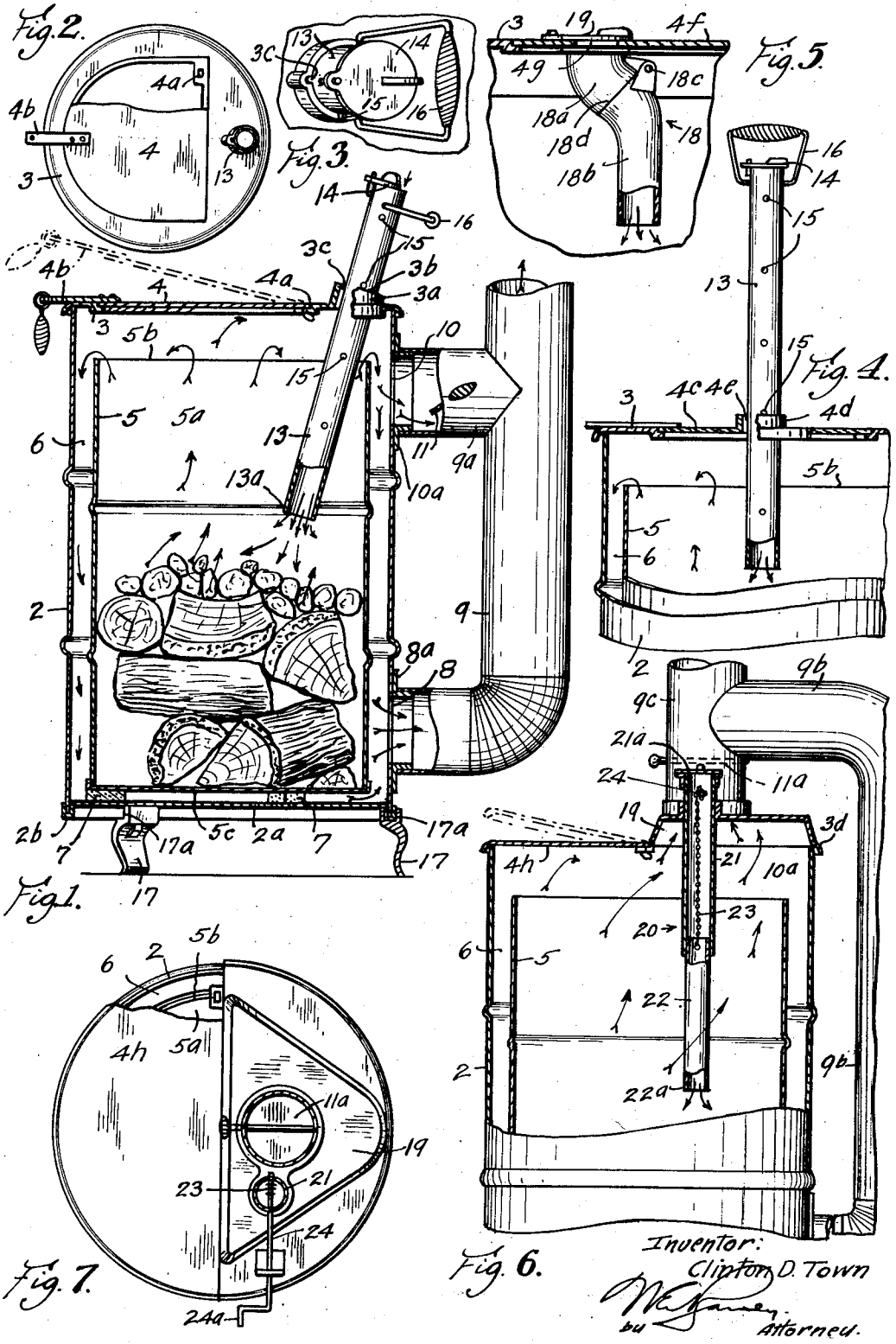
Feb. 13, 1940. C. D. TOWN 2,190,343

DUAL COMPARTMENT STOVE

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DUAL COMPARTMENT STOVE

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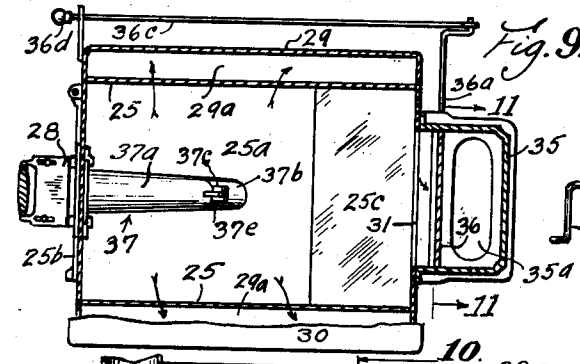


Fig. 9.

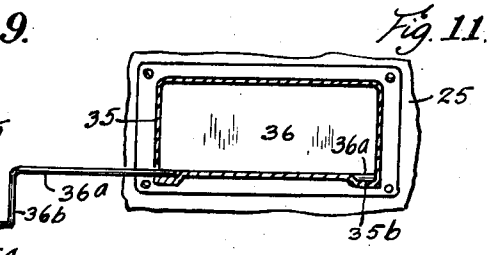


Fig. 11.

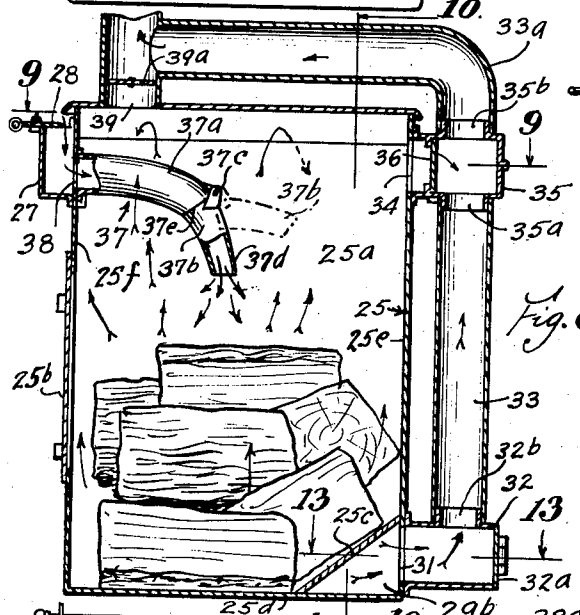


Fig. 8.

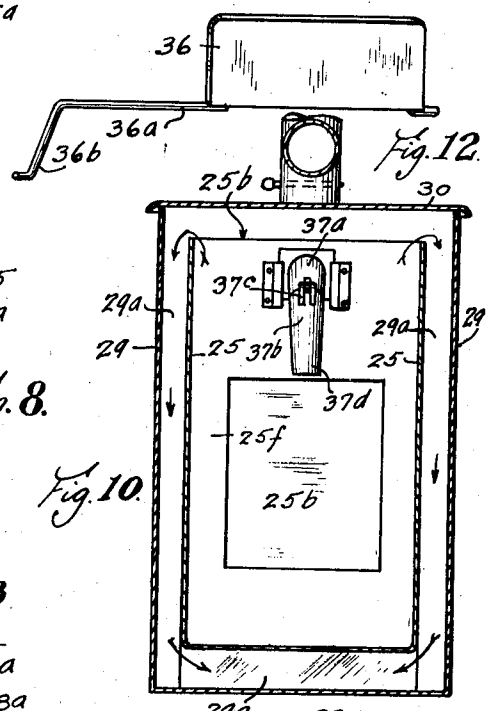


Fig. 12.

Fig. 10.

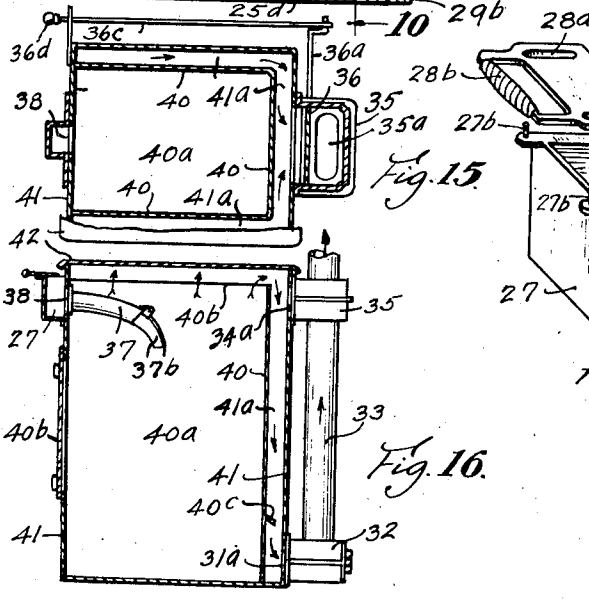


Fig. 15.

Fig. 16.

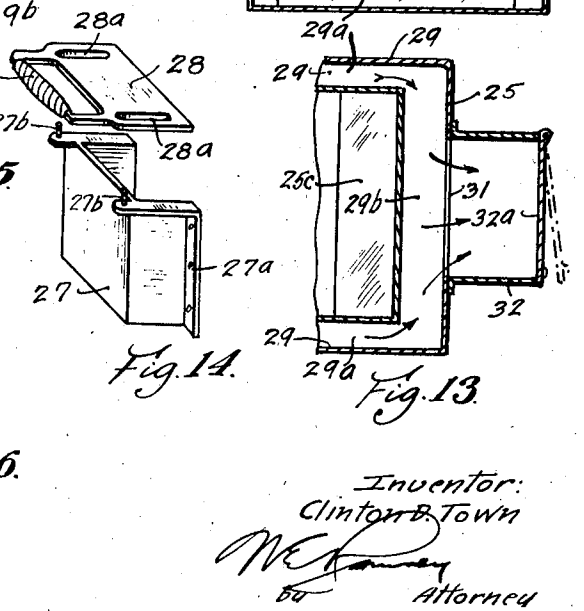


Fig. 14.

Fig. 13.

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2,190,343

DUAL COMPARTMENT STOVE

Clinton D. Town, Portland, Oreg.

Application October 30, 1937, Serial No. 171,944

18 Claims. (Cl. 126—75)

The principal object of my invention is to provide an efficient stove, furnace or other heating device adapted to receive varying quantities of fuel to be burned, but in which the burning rate can be controlled to provide a uniform production of heat.

A further object of my invention is to provide a device of this character in which the fuel is burned efficiently and the heat generated thereby is radiated over such a large area that only a small percentage of the heat generated therein passes up the flue.

A further object of my invention is to provide an inexpensive, efficient stove adapted to utilize standard metallic containers, such for example as oil drums, and to which it is necessary to add only a cover element, flue and draft connections to provide an efficient stove.

A further object of my invention is to provide a stove of this character in which the air admitted to support combustion is directed downwardly on to the top of a quantity of burning fuel to produce efficient combustion thereof and the air supplying devices are adapted to be adjustable so as to direct air into and across said body of burning fuel from differeint points to support combustion in an efficient manner.

A further object of my invention is to provide devices by which the direction of flow of the burning products of combustion, smoke and the like, can be directed along alternate paths by control devices so that the stove cover can be lifted and a fresh supply of fuel be added without allowing a substantial quantity of smoke and flame to escape into the room.

Further details of my invention and several structures embodying alternate forms of said invention are hereinafter described with reference to the accompanying drawings in which one embodiment of my invention is shown in Figs. 1 to 3, inclusive, alternate forms thereof in Figs. 4, 5, 6 and 7 and a further modification of said invention is shown in Figs. 8 to 14, inclusive, and a still further modification thereof is shown in Figs. 15 and 16. Said figures in numerical sequence are as follows:

Fig. 1 is a vertical section thru a heating stove embodying my invention in which the draft and flue connections are shown in elevation and parts are shown broken away to disclose details of construction;

Fig. 2 is a plan view looking down upon the structure shown in Fig. 1 with a portion of the lid shown broken away;

Fig. 3 is a perspective detail looking downwardly upon the tubular draft control element;

Fig. 4 is a broken elevation of a heating device illustrating how the tubular draft control can be vertically adjusted;

Fig. 5 is a modification of my invention showing an alternative draft control comprising two halves hingedly joined together to provide adjustment;

Fig. 6 is a fragmentary broken elevation showing a still further modification of my invention in which a tubular draft control comprises two sections telescoping one within the other to secure vertical adjustment;

Fig. 7 is a broken plan view looking down upon the stove shown in Fig. 6 and illustrating structural details thereof;

Fig. 8 is a vertical section taken thru a modified form of my invention;

Fig. 9 is a horizontal section taken thru the modification shown in Fig. 8 taken on the line 9—9 therein;

Fig. 10 is a vertical section taken thru said modification on the line 10—10 in Fig. 8;

Fig. 11 is a fragmentary vertical section taken on the line 11—11 in Fig. 9;

Fig. 12 is a perspective view of the damper element of said modification;

Fig. 13 is a horizontal section taken on the line 13—13 in Fig. 8;

Fig. 14 is a perspective detailed view of the structure of the draft intake;

Fig. 15 is a smaller scaled horizontal section similar to Fig. 9 of a further modification of my invention in which the firebox is housed within a flue section which extends about three sides of said firebox; and

Fig. 16 is a vertical section similar to Fig. 8 of the modification shown in Fig. 15 illustrating the manner in which flue gases are permitted to move downwardly along the back of the stove as well as along the side thereof.

In the embodiment of my invention shown in Figs. 1 to 4, the stove is housed within a cylindrical container 2 having a bottom 2*a* and a cover 3 extending across the upper end of said container. Said cover includes a hinged lid 4 lying within the bounds of said cover as illustrated in Fig. 2. Said lid is pivoted at 4*a* and is provided with a handle lever 4*b* at the opposite side extending beyond the margin of the stove so as to provide a convenient device for lifting said lid. One convenient and inexpensive type of container adapted to be used in a stove of this character is a standard oil container or drum and it is such a container that is illus-

trated in the drawings. A smaller sized drum 5 is arranged within the larger one and constitutes the fuel holder or firebox. The drums being of different diameter thus provide a downwardly extending flue space 6 lying exteriorly of the inner container 5 and interiorly of the housing or shell 2. Said space preferably completely surrounds the inner container. Thus, I preferably arrange blocks of material 7 so as to space the bottom 5c of said inner container from the bottom 2a of the outer one and thus products of combustion can flow underneath the inner container 5 as well as around the sides thereof. The container 5 preferably is shorter than the outer one as well as being smaller in diameter and thus the upper edge or rim 5b lies below the plane of the lid 4 so as to permit flue gases to pass over said rim as is indicated by arrows at 5a in Fig. 1.

Arranged adjacent the bottom of the shell 2 is a flue opening or vent 8 lying within a thimble 8a. A flue pipe 9 is joined to said thimble and communicates with the said flue opening. Another auxiliary flue opening 10 is arranged in a thimble 10a near the top of the shell and a section of flue 9a joins said opening to the main flue 9. A damper 11 is provided which normally is arranged to prevent flue gases from passing thru the flue opening 10 to the flue. That is, said damper 11 normally lies transversely of said section of flue pipe 9a to prevent smoke from passing upwardly therein.

Extending downwardly thru the cover plate 3 is a tubular draft element 13. Said tubular draft element extends thru the bore of an integral collar 3a formed in said cover. A movable draft control plate 14 is adapted to lie wholly or partially across the bore of said tubular draft element to correspondingly restrict the flow of air therethru. Projecting buttons 15 are spaced at equal intervals along the exterior of said draft element and are adapted to engage the top 3b of said collar 3a. An offset portion 3c is arranged in said collar being proportioned to permit said buttons readily to pass therethru. Thus the draft element 13 can be lifted lengthwise or dropped further into the interior of the drum 5 by arranging said buttons in alinement with the passageway 3c. When the draft element is arranged at approximately its proper position it can be rotated slightly so that the buttons are out of alinement with said passageway 3c to lock said draft element 13 against further movement downwardly. A handle 16 is provided for shifting said member 13, said handle extending over the draft plate 14. Legs 17, usually three in number, are arranged on the under surface of the outer drum 2. They engage the lower rim 2b of the container 2 in a pocket 17a formed in said legs 17.

In Fig. 4 I illustrate how the tubular draft member 13 can be arranged to extend vertically thru the center of a lid 4c arranged in the cover plate. Said lid is provided with a collar 4d for engaging the projecting buttons 15 upon said tubular draft element. A passageway 4e is provided for permitting passage of said buttons when said buttons are alined therewith substantially the same as in the passageway 3c shown in Figs. 1 to 3, inclusive.

In Fig. 5 I have shown a modified draft element 18 pendantly hung from a lid 4f. In this modification a curved section 18a of said tubular draft control extends downwardly from said lid 4f and another section 18b is pivotally joined thereto by a pin 18c. When said sections are arranged normally they abut on the parting line 18d. If a large amount of fuel is arranged within the container 5 it is permitted to extend above the normal end of the section 18b which is swung counterclockwise about the pivot pin 18c and draft air escapes from the end 18d. A draft control 19 functions in the same way as control element 14 in the previous modification and overlies an aperture 4g in said lid 4f.

In Figs. 6 and 7 I show a still further modification of my invention. A removable cover 3d is arranged upon the open mouth of the outer container 2 and said cover is provided with a pivoted lid 4h. One section 19 of said cover extends to a higher plane than the remainder of the cover and is adapted to constitute a dome for catching smoke. Extending upwardly from said dome is a section of flue 9c. A damper plate 11a normally lies across said flue to prevent smoke from passing upwardly therein. All flue gases are then directed over the top of the inner container and down thru the passageway 6 into the flue opening 9b adjacent the bottom of the outermost container 2. When the lid 4h is opened I preferably open the damper plate 11a so that smoke will rise into the dome and pass directly out the flue and will not pass outwardly from the container thru the space normally closed by the hinged lid 4h. The flue 9c being arranged adjacent the center of the cover plate 3d and more or less over the open mouths of the containers 2 and 5 thus is adapted to receive said flue gases readily to prevent the escape thereof thru the opening provided by the lifting of the cover 4h.

Also illustrated in the latter modification shown in Figs. 6 and 7 is a draft controlled element 20 comprising two telescopic sections, a fixed one 21 pendantly mounted in the sections 19 of the cover 3d and a movable one 22 slidably mounted within the bore of the section 21. A chain 23 holds the movable section 22 in place and said chain is adapted to be wound about a windlass arrangement 24 having a handle 24a formed thereon. Thus, by rotating the windlass 24 the chain is coiled on or off of the latter to lower or raise the mouth 22a of said section 22 correspondingly.

In Figs. 8 to 16, inclusive, I show two different modifications of my invention shown incorporated in structures specifically built into a stove or other heating device. By that I mean in the previous structures, standard oil drums or containers were converted into stoves. In the present modifications the structures are specifically designed for their use in a stove.

In the modifications shown in Figs. 8 to 14, inclusive, the stove is shown provided with a firebox 25 which defines a combustion chamber 25a within its interior. Access is had to said combustion chamber thru a door 25b. A draft chamber 27 is shown removably secured to the front of said firebox. Said chamber is secured to the firebox by flanges 27a shown more particularly in Fig. 14. A cover 28 is provided for said chamber which is adjustably mounted across the opening therein. Said cover is provided with slotted holes 28a which fit over upstanding pins 27b. The slotted character of the holes permits the cover to be shifted laterally to vary the effective size of the opening into said draft chamber.

Lying at two sides of the firebox is a jacket 29 defining two lateral down flues 29a. The jacket extends up higher than the top of the firebox so that products of combustion can pass over the top of the firebox under the cover 30 and down

between the jacket 29 and the firebox 25. This provides two lateral down flues 29a extending the full height of the firebox 25. Extending across the bottom of the firebox is a transverse flue 29b which joins the bottoms of the lateral down flues 29a. Said transverse flue 29b is defined by an inclined floor section 25c and a prolongation of the horizontal floor 25d. This provides a transverse flue connection of triangular section as is illustrated in Fig. 8. This permits the flues to communicate and gases to pass out thru a vent 31 leading to the stove pipe 33.

Arranged immediately externally of said vent is a base chamber for the stove pipe. The chamber is joined to the stove pipe by a thimble 32b extending upwardly from said chamber. Extending laterally from said base chamber and hingedly secured thereto is a clean out door 32a. Said door also serves as a draft check to cut down the effective draft of the flue connections.

Arranged at the upper edge of the firebox is an auxiliary vent 34. A casing 35 is joined to the jacket adjacent said vent and it communicates therewith. Said casing provides a passageway from the combustion chamber into the interior of the stove pipe. A damper 36 is pivotally mounted across said vent where it joins the vent casing and said damper, in the position shown in Fig. 8, cuts off communication between said vent and said stovepipe. When it is arranged otherwise it provides access thru said vent 34. Said damper is a flat section of metal provided with a damper rod 36a which constitutes a pivot for said plate. A crank arm 36b is formed integrally with said damper rod and a pull rod 36c operatively engages said crank arm. Said pull rod terminates in a knob 36d arranged at the front of the stove. Thus, the damper 36 can be manipulated from a point adjacent the door of said firebox.

When the door is opened, the vent 34 is arranged to be opened so that smoke from the firebox will pass thru said vent more readily than thru the door 25b. When the door is closed the vent 34 is also closed so that the flue gases are required to traverse the entire height of the firebox thereby to provide a greater opportunity for the radiation of heat thru the walls of the jacket and into the room in which said stove is located. As an optional draft control I provide a vent 39 arranged vertically above the door 25b. Said optional vent 39 is also provided with a damper 39a which is subject to manual manipulation. In the case of very heavy smoke I preferably open the optional vent 39 so that the smoke can pass directly upwardly into the stove pipe.

The bore of the tubular draft element 37 defines a draft aperture 38 for admitting air into the combustion chamber. That is, air for supporting combustion is permitted to pass by the edge of the cover 28 for the draft chamber 27 and enter the bore of tubular draft element 37. Said tubular draft element depends into the combustion chamber and is made in two pieces. One piece 37a is fixed to the inner face of the firebox 25. The other piece 37b is hingedly secured to the fixed portion and extends more or less vertically into the combustion chamber. When fuel is arranged as shown in Fig. 8, the piece 37b hangs downwardly to face said fuel so as to direct a blast of air for supporting combustion of said fuel. If a greater quantity of fuel is arranged in the combustion chamber, said piece is swung upwardly into the position shown in dotted lines in Fig. 8. When it swings to said last named position, it is supported by a hinged pin 37c at one end and by the fuel at the other. The mouth 37d of said hinged portion will not direct a blast of air downwardly upon the fuel, but air for supporting combustion will pass outwardly from the end 37e of the fixed portion 37a.

In the normal operation of a stove embodying these features, air will be permitted to pass by the edge of the cover 28 for the draft chamber and will be directed downwardly thru the bore of the tubular draft element onto a quantity of burning fuel. The products of combustion will rise in the combustion chamber and when they approach the proximity of the under surface of the stove cover 30, they will be directed downwardly over the sides of the firebox into the laterally projecting down flues 29a. Said downwardly flowing hot gases will radiate their heat thru the walls of the jacket to the room. The walls of said jacket are relatively thin and are efficient heat transfer agencies and the cooling gases will be collected in the transverse flue 29b and directed into the bottom of the stove pipe 33 thru the vent 31. The gases will then pass up thru the stove pipe and thru its lateral branch to the atmosphere.

In Figs. 15 and 16 I illustrate how the firebox 40 of a stove can be surrounded at three sides by a jacket 41 to define flues 41a at both sides and at the back thereof. In other respects the stove illustrated in Figs. 15 and 16 is similar to the one shown in Figs. 8 to 14, inclusive, and similar reference characters are given to the various parts thereof. Said firebox 40 houses a combustion chamber and access is had to said chamber thru a door 40b. The products of combustion are permitted to flow upwardly until they strike the cover 42 and are then directed downwardly thru said flues 41a to the bottom of the jacket 41. I preferably provide a baffle plate 40c along the back down flue over the vent 31a. Said baffle tends to restrict the downflow of flue gases thru said back section and tends to direct flue gases more uniformly thru the flues arranged at the sides of said firebox.

I claim:

1. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element adjustable to vary the plane of the effective outlet of said draft connection vertically, and means for selectively fixing the height of said outlet by hand while said elements are in their normally heated condition.

2. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of vertically adjustable sections adapted to vary the plane of the effective outlet of said draft connection vertically, and means for selectively fixing the height of said outlet by hand while said elements are in their normally heated condition.

3. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of sections adjustable to vary the plane of the effective outlet of

said draft connection vertically, means for selectively fixing the height of said outlet by hand while said elements are in their normally heated condition, and a flue connection opening thru the wall of the jacket at a point below the top of the firebox.

4. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of sections adjustable to vary the plane of the effective outlet of said draft connection vertically, means for selectively fixing the height of said outlet by hand while said elements are in their normally heated condition, and a flue connection opening thru the wall of the jacket at a point adjacent the base of said heating jacket.

5. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of sections adjustable to vary the vertical plane of the effective outlet of said draft connection, and a flue connection having two openings, one opening thru the wall of the jacket at a point below the top of the firebox, the other provided with an adjustable damper.

6. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of sections adjustable to vary the vertical plane of the effective outlet of said draft connections, and a flue connection opening thru the wall of the jacket at a point below the top of the firebox, said heating jacket including two spaced vertically extending flues leading from the firebox to the flue connection.

7. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of sections adjustable to vary the plane of the effective outlet of said draft connection vertically, means for selectively fixing the height of said outlet by hand which said elements are in their normally heated condition, a flue connection opening thru the wall of the jacket at a point below the top of the firebox, said heating jacket including two spaced vertically extending flues leading from the firebox to the flue connection, and a communicating passageway joining said flues adjacent their lowermost ends.

8. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other, arranged with the smaller seated in the larger with the sides of said containers spaced apart, a cover seating across the mouth of the outer container, and a vertical draft connection extending thru said cover and into the inner container.

9. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other, arranged with the smaller seated in the larger with the sides of said containers spaced apart, a cover seating across the mouth of the outer container, and a vertically extensible draft connection extending thru said cover and into the inner container.

10. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other, arranged with the smaller seated in the larger with the sides of said containers spaced apart, a cover seating across the mouth of the outer container, and a vertically extensible pendant draft connection extending thru said cover and into the inner container.

11. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other arranged with the smaller seated in the larger with the sides of said containers spaced apart, a cover seating across the mouth of the outer container, and a vertically movable pendant pivoted draft connection extending thru said cover and into the inner container.

12. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller than the other arranged with the smaller removably seated in the larger with the sides of said containers spaced apart, the open mouth of the outer container extending to a plane spaced above the mouth of the smaller one, and a removable cover seating across the mouth of the outer container, said cover including a removable lid element and a vertical draft connection extending thru said cover and into the inner container.

13. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller than the other, arranged with the smaller removably seated in the larger with the sides of said containers spaced apart, the open mouth of the outer container extending to a plane spaced above the mouth of the smaller one, a removable cover seating across the mouth of the outer container, said cover including a removable, hinged lid element, and a vertical draft connection extending thru said cover and into the inner container.

14. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other, arranged with the smaller removably seated in the larger with the sides of said containers spaced apart, a removable cover seating across the mouth of the outer container, a flue connection opening thru the wall of the outer container at a point below the mouth of the inner container, and a vertical draft connection extending thru said cover and into the inner container.

15. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other, arranged with the smaller removably seated in the larger with the sides of said containers spaced apart, a removable cover seating across the mouth of the outer container, a flue connection opening thru the wall of the outer container at a point adjacent the base of said outer container, and a vertical draft connection extending thru said cover and into the inner container.

16. A heating device comprising a firebox, an encompassing heating jacket communicating therewith adjacent the top of said firebox, and

a draft connection extending vertically into said firebox, said connection comprising a tubular element composed of a plurality of jointed sections adapted to vary the plane of the effective outlet of said draft connection vertically, the endmost of said sections being movable, said endmost section being adapted to be supported and positioned by the unburned fuel in said firebox.

17. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other arranged with the smaller removably seated in the larger with the sides of said containers spaced apart, a removable cover seating across the mouth of the outer container, a flue connection having two openings extending through the wall of the outer container at points below the mouth of the inner container, one of said openings being provided with a damper and lying substantially above the other opening, and a vertical draft connection extending through said cover and into the inner container.

18. A heating device comprising two open mouthed containers each having a continuous and imperforate bottom, one smaller and shorter than the other arranged with the smaller removably seated in the larger, the bottoms and sides of said containers being spaced apart, a removable cover seating across the mouth of the outer container, a flue connection having two openings extending through the wall of the outer container at points below the mouth of the inner container, one of said openings being provided with a damper and lying substantially above the other opening, and a vertical draft connection extending through said cover and into the inner container, the lowermost end of said draft connection being movable to follow the fuel in said inner container as said fuel diminishes in height by burning.

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