Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 1

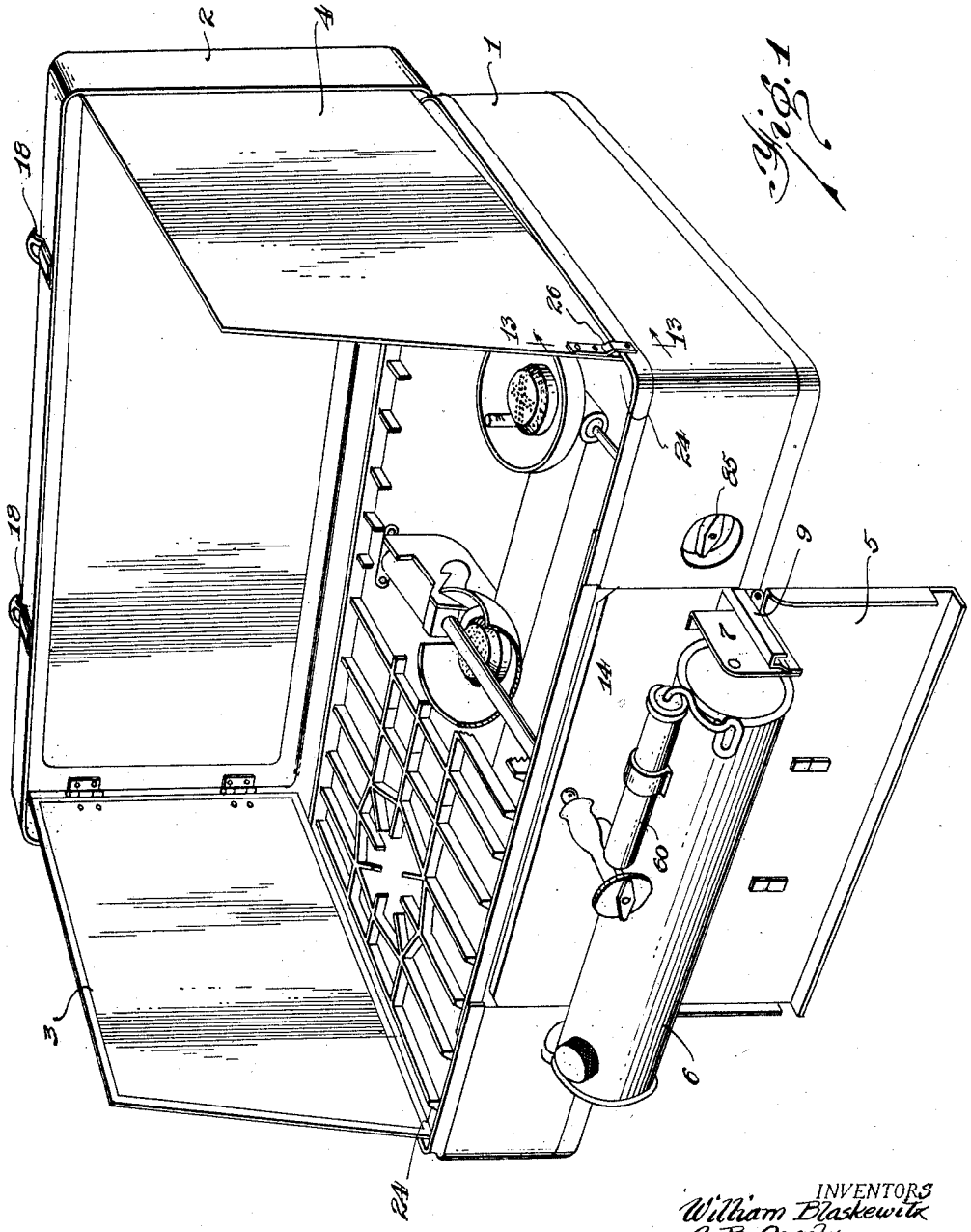


Fig. 1

INVENTORS
William Blaskewitz
C. B. Overly
Charles F. Lambert
James Ingside

BY Stuart C. Bares
ATTORNEY.

Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 2

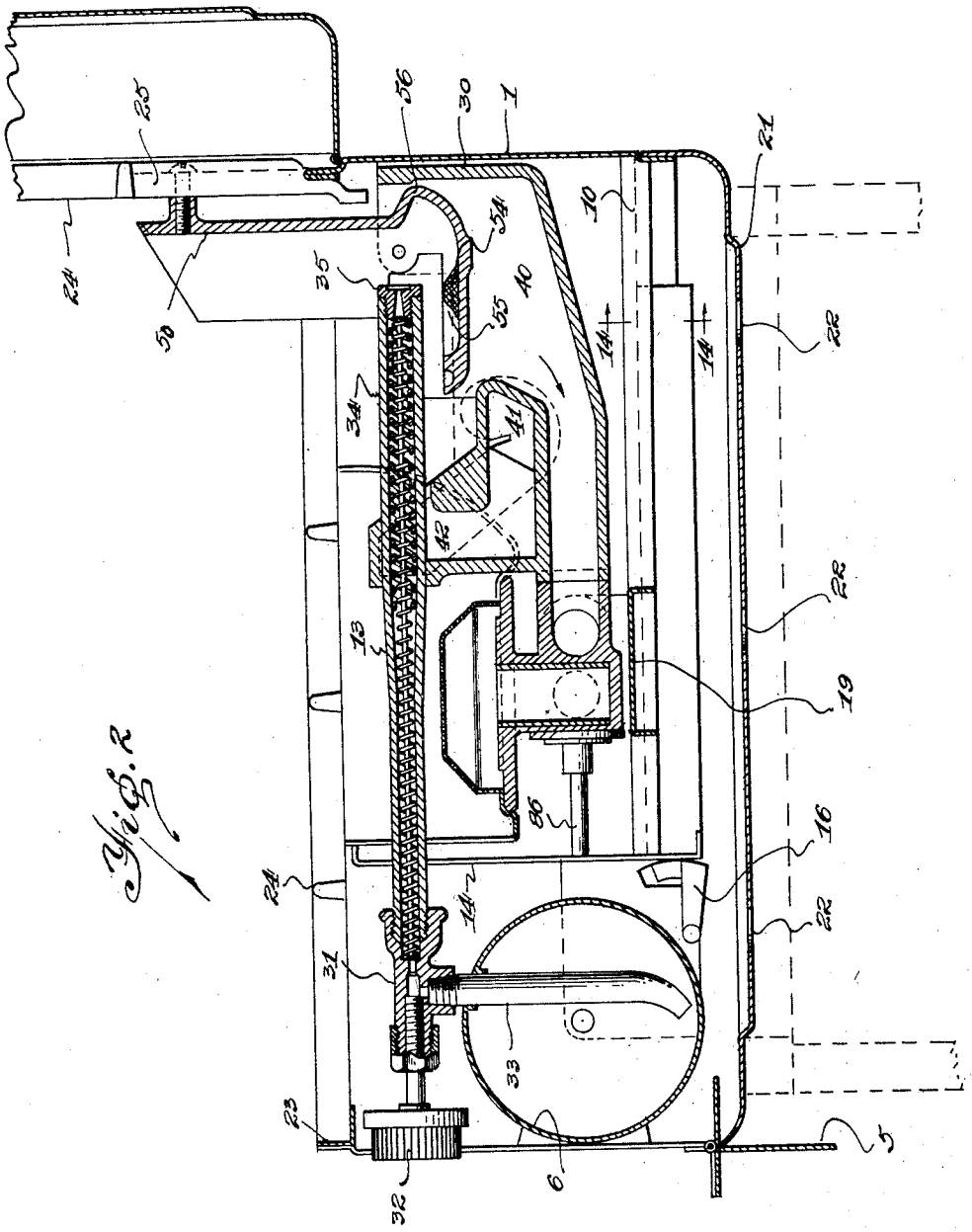


Fig. 2.

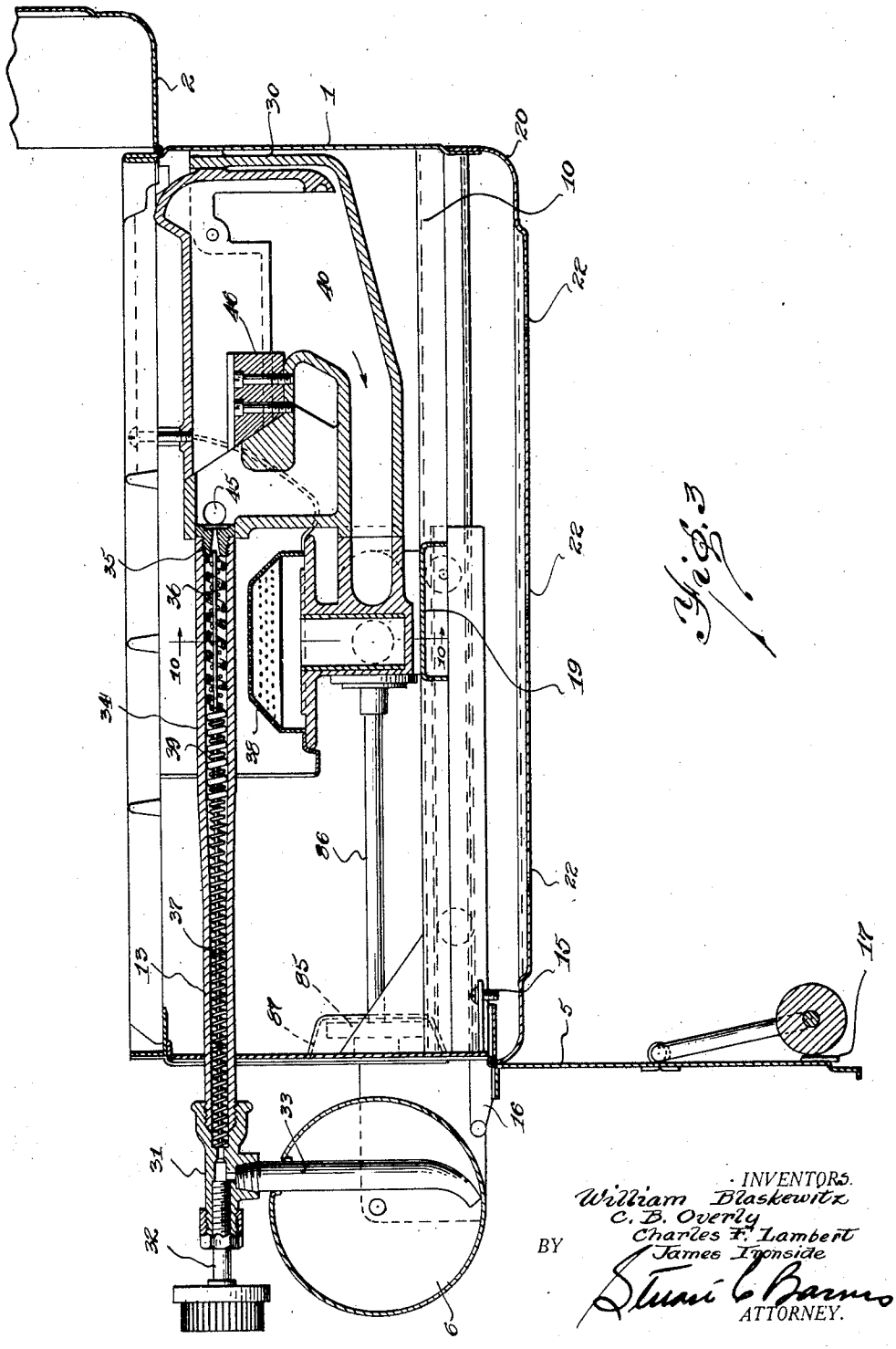
INVENTORS
William Blaskewitz
C. B. Overly
Charles F. Lambert
James Ironside

BY Stuart C. Barnes
ATTORNEY.

Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 3



INVENTORS.
William Blaskewitz
C. B. Overly
Charles F. Lambert
James Ironside
BY Stuart C. Barnes
ATTORNEY.

Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 4

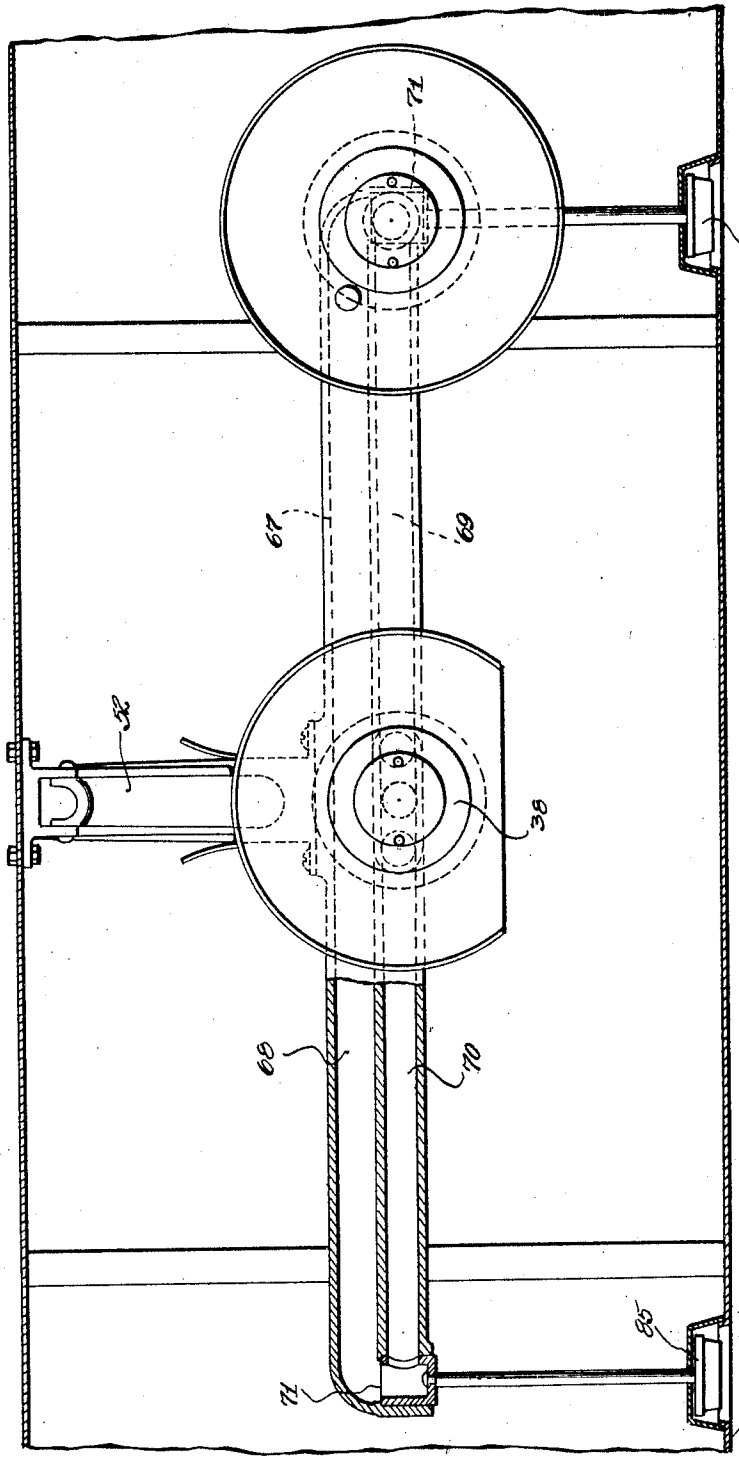


Fig. 4

INVENTORS:
William Blaskewitz.
C. B. Overly
Charles F. Lambert
James Ironside
Stuart C. Barnes
ATTORNEY.

Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 5

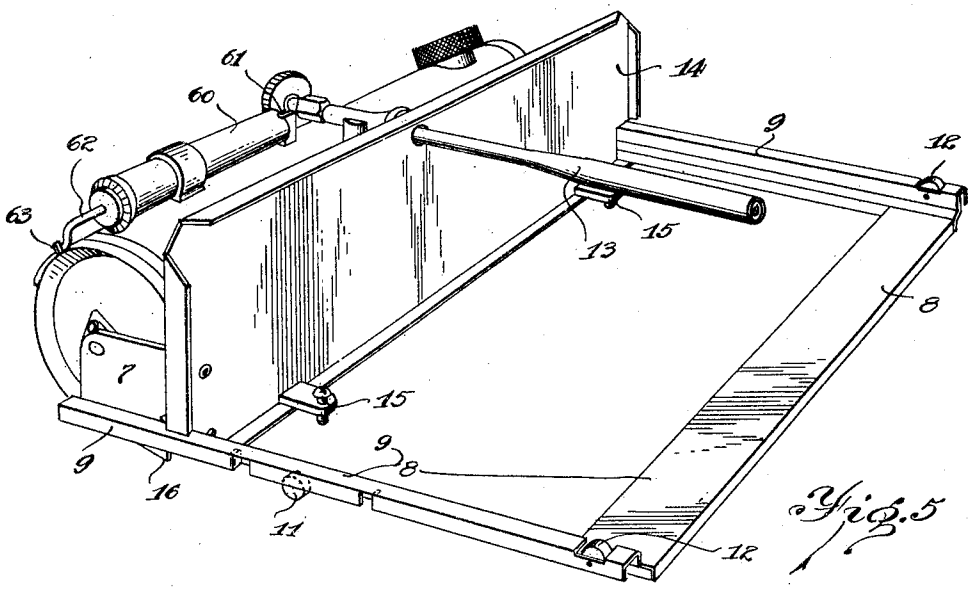


Fig. 5

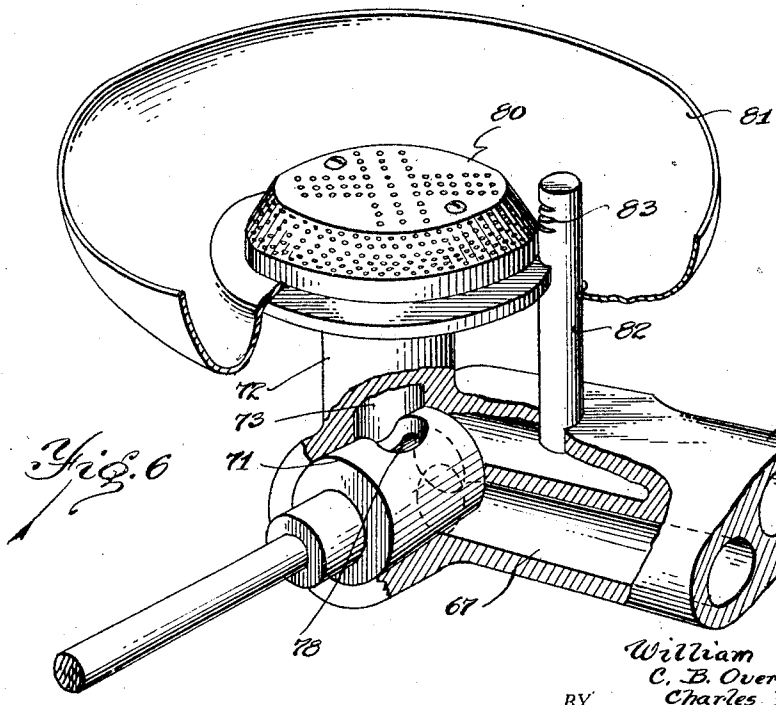


Fig. 6

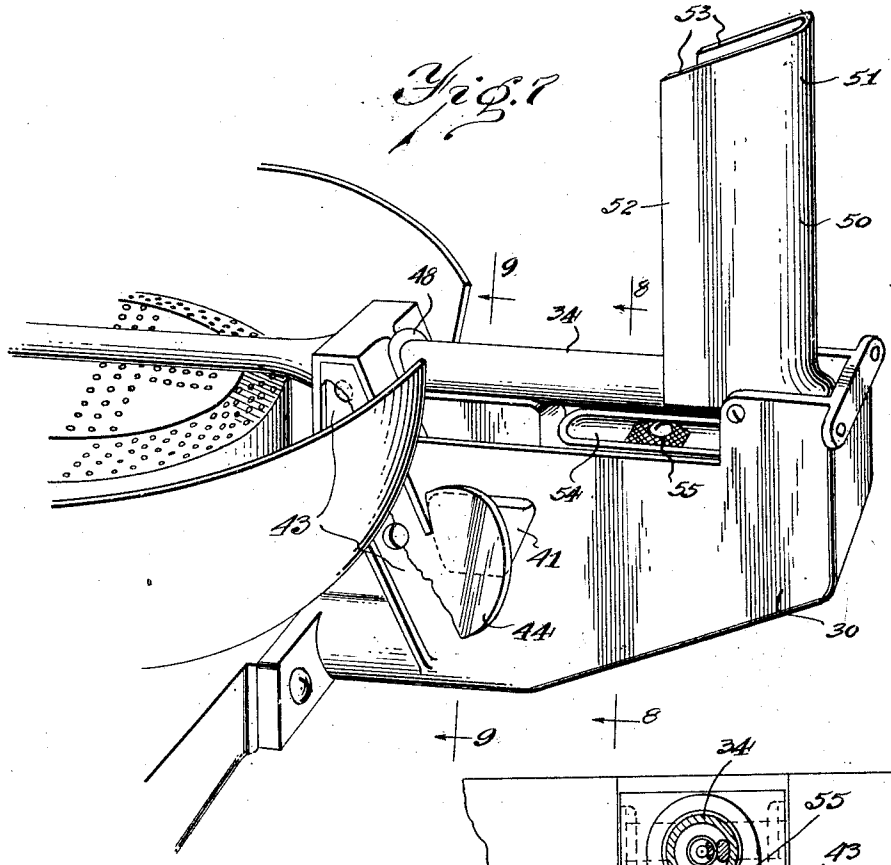
INVENTORS.
William Blaskewitz
C. B. Overly
Charles F. Lambert
James Ironside
BY Stuart G. Barnes
ATTORNEY.

Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 6

Fig. 7



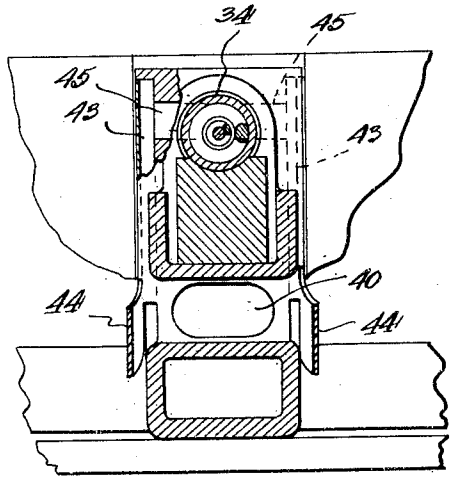


Fig. 9

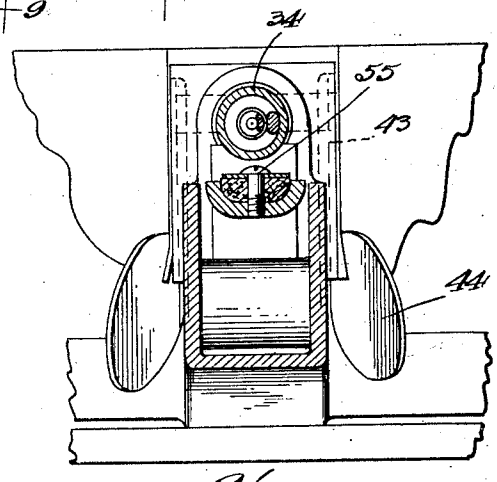


Fig. 8

INVENTORS
William Blaskewitz
C. B. Overly
BY Charles F. Lambert
James Ironside
ATTORNEY.

Nov. 12, 1929. W. BLASKEWITZ ET AL 1,735,151

STOVE STRUCTURE

Original Filed Aug. 27, 1926 7 Sheets-Sheet 7

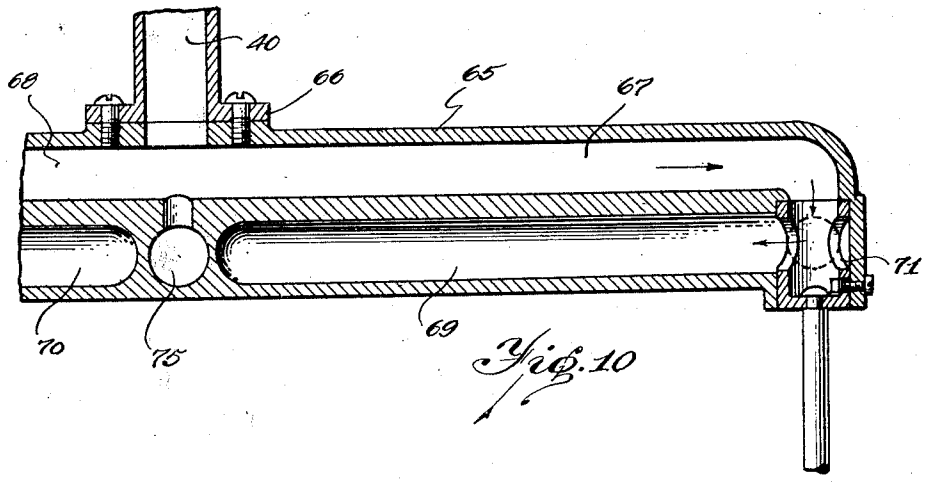


Fig. 10

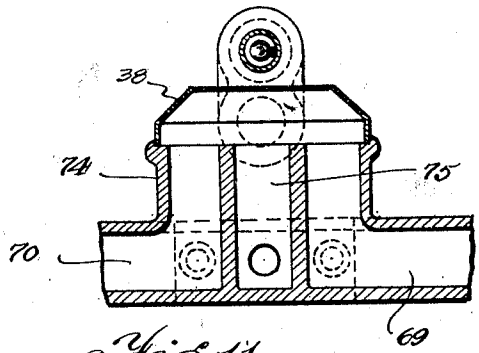


Fig. 11

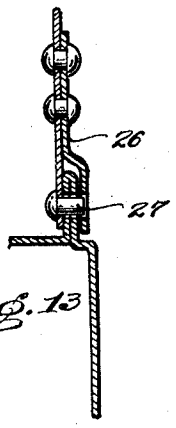


Fig. 13

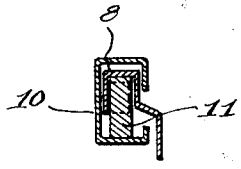


Fig. 14

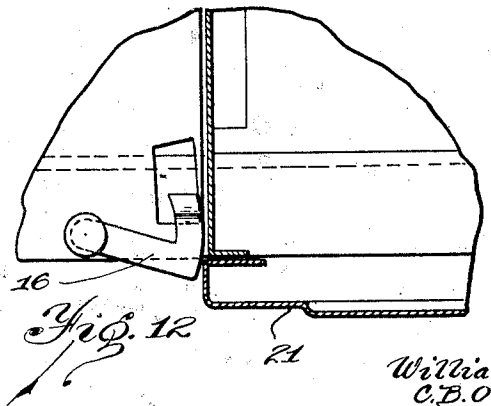


Fig. 12

INVENTORS.
William Blaskewitz
C. B. Overly
Charles F. Lambert
James Ironside

BY Stuart Bacon

ATTORNEY.

Patented Nov. 12, 1929 1,735,151

UNITED STATES PATENT OFFICE

WILLIAM BLASKEWITZ AND CLARENCE BURT OVERLY, OF DETROIT, CHARLES F. LAMBERT, OF GROSSE POINTE, AND JAMES IRONSIDE, OF DETROIT, MICHIGAN, ASSIGNORS, BY MESNE ASSIGNMENTS, TO CLAYTON & LAMBERT MANUFACTURING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF DELAWARE

STOVE STRUCTURE

Original application filed August 27, 1926, Serial No. 131,868. Divided and this application filed July 8, 1927. Serial No. 204,198.

This invention relates to stove structure and has to do more particularly with stoves of the liquid fuel type and the method of operating the same. It also results in important efficiencies and economies in operation in that the liquid fuel is preheated and generated in an efficient, novel manner, and the liquid fuel generated into a gas is of an efficient and uniform quality at all times.

The class of stoves referred to are at the present time manufactured in two forms, namely, portable, or folding stoves, typified by the oil and gasoline type, and permanent stoves or ranges adapted to be utilized as a permanent part of a household. The first type of stoves, namely, the portable or folding type has presented many problems as to efficient and safe operation mainly due to the fact that the various parts have been necessarily detachable and relatively movable. The larger stoves of the permanent or range type have not presented the same difficult problems as to efficient, safe operation as the folding type, but nevertheless even such large stoves have been more or less inefficient in what has been known as the starting or priming operation and have also been more or less inefficient in maintaining a proper fixed quality of combustible mixture under all conditions of operation.

In its preferred form our apparatus contemplates the provision of a compact, unitary stove structure parts of which are so permanently arranged and so fabricated as to present a novel rigid stove construction substantially as natural in appearance and as serviceable as a standard liquid fuel range but which parts are also so arranged and fabricated as to present a stove structure, parts of which are unitary and permanent, but which may be folded or collapsed as a unit.

A further feature of the invention has to do with novel preheating and mixing means, the novel operation and result of positioning the fuel supplying means relative to the preheating and mixing means, and the method of controlling the positioning of the fuel supply means whereby to positively control the correct and efficient operation of the unit.

Other and further objects of the present invention will in part be obvious, and will in part be pointed out hereinafter in the specification wherein like parts are indicated by like characters throughout the several figures of the drawings. Realizing that the present invention may be embodied in constructions other than the ones herein shown and specifically described, it is to be understood that the present disclosure is to be illustrative and not to be considered in the limiting sense.

This application is a division of my copending application, Serial No. 131,868, filed August 27, 1926.

In the drawings:

Fig. 1 is a perspective view of a foldable stove unit embodying the features of our invention and illustrating the stove in extended operative position.

Fig. 2 is a vertical sectional view taken transversely and centrally of the stove unit and illustrating the positioning and cooperation of the various parts preparatory to the creating of the initial hot blast for initially heating the generator.

Fig. 3 is a view similar to Fig. 2 but showing the various parts in extended normal operating position and also showing the manner of collapsing the preheating unit to form a mixing chamber, and the preferred manner of positioning the jet block when the parts are in such operating position.

Fig. 4 is a plan view, partly broken away, of the manifold and burner units illustrating the novel manner of maintaining a uniform quality of fuel mixture.

Fig. 5 is perspective view of our novel unitary gas generator and fuel supplying unit, and the compact manner of forming and fabricating the same so as to obtain the novel cooperation of the various parts.

Fig. 6 is a perspective view, partly broken away, of one end of the manifold and the burner structure and showing the novel manner of controlling the introduction of fuel to the burner and also showing the manner of conducting the fuel to the central burner in case the supply of one burner is cut off.

Fig. 7 is an enlarged, fragmentary per-

spective view of our novel, combined preheater and mixing chamber and illustrating the housing therefor in open position preparatory to preheating the generating tube for starting the apparatus.

Fig. 8 is a vertical sectional view taken on line 8—8 of Fig. 7 and illustrating the cross sectional form of the enlarged end of the generating tube, the wick, or well, for the gasoline charge and main manifold passageway.

Fig. 9 is a cross sectional view taken on line 9—9 of Fig. 7 and showing the particular and relative positions of the various air ports and the manifold intake for obtaining the correct fuel mixture.

Fig. 10 is fragmentary, horizontal cross section of our novel manifold structure and illustrating the manner of conducting and by-passing the gases to the central burner.

Fig. 11 is a vertical sectional view of the central burner taken on line 10—10 of Fig. 3.

Fig. 12 is a fragmentary sectional view taken through the stove casing and illustrating the manner of locking the supplying and generating unit in extended position.

Fig. 13 is a fragmentary sectional view illustrating the manner of locking the protecting shields in place to retain the shield and cover in operating position.

Fig. 14 is a vertical sectional view taken on line 14—14 of Fig. 2.

In describing the various parts of our invention it will be well to recognize that the apparatus preferably used therein separable broadly into a compact, foldable unitary stove unit, parts of which are all permanently and operatively connected, preheating, and gas generator mechanism, and fuel distributing apparatus. These three combinations are relatively independent in the sense that any one of them may be removed and replaced by other apparatus designed to accomplish the same results, but which are relatively dependent and cooperate to obtain the desired general results.

This foldable unitary stove unit is best shown in Fig. 1 as comprising a stamped sheet metal case 1, a foldable top member 2, foldable wind deflectors 3 and 4 hinged thereto, and a hinged foldable member 5 which forms the handle member when the case is folded and is adapted to drop down when the case is unfolded to permit withdrawal and positioning of the fuel tank unit. This fuel supply unit comprises mainly a fuel tank 6 which is suitably supported by means of the bracket 7 to the slide member 8 which serves as a frame for assisting and slidably supporting the fuel supply unit within the case.

The sliding frame comprises the runner members 9 which are designed to slidably fit within guide members 10 extending transversely of the case. Said runner members 9 have roller bearing contact by means of the rollers 11 and 12 with the top and bottom sides of said guide members 10. A generating tube 13 is permanently connected to the fuel supply tank 6 and a suitable heat deflector 14 and is also carried by this fuel supplying unit whereby the heat deflector 14 cooperates with the wall of the case when the fuel supplying unit is extended in operating position. This heat deflector is a very important feature as it permits the fuel supplying unit to be inwardly or outwardly positioned as a unit without the disconnecting or rearranging of any parts, and serves as a permanent heat deflector when the fuel supplying unit and stove structure in general is in normal operating position.

As best shown in Fig. 5 the slidable frame 8 is provided with suitable lugs and screws 15 for limiting the outward movement of the burner, and the sliding frame is also provided with suitable gravity catches 16 for automatically dropping into position and locking the fuel supplying unit in outer position. The slidably supported unitary fuel supplying means is limited in its innermost position by contact between the shield 14 and the radiator shield for the burner, as best shown in Fig. 2. This innermost and outermost predetermined position of the fuel supplying unit and the generator tube 13 has a very important function in the operation of applicants' device, as will be more fully set forth in detail. For the present purpose the innermost predetermined position of the fuel supplying unit may be called the preheating position, and the outermost predetermined position may be termed the operating position. It will therefore be obvious that my fuel supplying means, together with the protecting shield therefore not only is extensible and collapsible to perform a definite function, but that such unit also slides neatly into place, or out into operating position as a permanent part of the stove, requiring no disconnection or adjustments. When the unit is in innermost position, the combined cover plate and handle portion 5 may be moved into position, and such cover plate is provided with suitable lugs 17 for receiving the latch members 18 of the case top 2 to lock the case into assembled position so as to make it easier to carry and to simulate the general appearance of a standard suitcase, or similar article.

The tracks of the guides 10 for receiving the runner members 9 are preferably two in number, and spaced corresponding to the members 9. These tracks 10 are preferably secured to the side walls of the case 1 by means of suitable screws or rivets whereby the track members 10, which are connected by a cross piece 19, may be inserted as a separate unit within the stove casing. As the track members 10 wholly support the fuel

supplying unit, and the cross member 19 supports the burner manifold, as shown in Fig. 3, it will be obvious that the entire stove unit is supported as a unit independently of the carrying case, whereby such case may be dented or otherwise damaged without injury to the various units of the stove whereby they can be removed and assembled in another case if desired.

The bottom part of the case 1 is preferably formed with a stamped member 20 which cooperates with the side members of the case, as best shown in Figs. 2 and 3, whereby said cooperating parts may be welded, riveted, or otherwise suitably connected. This bottom portion is preferably embossed or struck out, as at 21, and is also provided with suitable perforations 22, spaced throughout the bottom thereof for providing proper air circulation. This bottom portion 20 is preferably so embossed or struck up, as at 21 whereby it may be fitted into or be supported by a stand having an annular frame member formed to receive this struck up or embossed portion, as shown in dotted lines in Fig. 2.

The top part of the case 1 is suitably formed, as at 23, to receive suitable grate members 24. The particular stove illustrated is provided with three separate members 24, the center grate member being hinged to the casing and also having a slidable connection, as at 25, with a part of the preheating and mixing housing, as will be later described in detail. The function of this hinging of part of the preheating and mixing housing to the hinged burner is that by merely lifting the hinged burner up, as shown in Fig. 2, the preheating and mixing chamber is opened and positioned to operate as a preheater, and when the grate is pushed down into normal position, as shown in Fig. 3, the preheating and mixing housing is collapsed or closed in normal operating position.

The windshields 3 and 4 of the stove casing are hinged to the top member 2, as clearly shown in Fig. 1, and are foldable therewithin, and when in extended position these windshields are adapted to be positioned and held in contact with these end members of the casing 1 by the resilient lugs 26, best shown in Figs. 1 and 13. These resilient lugs are bifurcated and are preferably provided with a suitable stud 27 which is adapted to register with suitable apertures in the ends of the casing member 1. It will therefore be obvious that in unfolding or extending the stove casing by merely opening up the shields 3 and 4 and pressing the bifurcated members 25 into position, that the top 2 and side shields 3 and 4 are held in closed position whereby to completely shield the stove from the sides and the rear.

The preheating and gas generating mechanism is best shown in Figs. 2, 3 and 7. This mechanism comprises two slidably positioned cooperating members one of which is the generating tube 13, and the other may be termed a combined preheating and mixing chamber and may be generally designated 30.

The generating tube 13 is preferably of such length that its end will be positioned adjacent the back of the member 30 when the unit is in closed position, and positioned just adjacent the front of the member 30, as shown in Fig. 3, when in open or operating position. This tube 13 is preferably screw fitted within a suitable valve housing 31 controlled by a suitable valve member 32. This valve housing 31 is designed to be fitted at the end of a suitable nozzle member 33 which is secured to and positioned within the fuel supply tank 6, as best shown in Figs. 2 and 3.

The end of the tube 13 is preferably expanded, or enlarged, as at 34, for a considerable portion of this length and the end of such enlarged portion 34 is provided with a suitable jet block 35, the valve controlling member 32 comprising a suitably shouldered valve for cooperating with the valve seat in the valve housing and is also provided with a rod 36 which extends the full length of the generator tube 13, and which is provided with a suitable wire at the end thereof, as clearly shown in Figs. 2 and 3, which wire projects through the orifice opening in the jet block and thus keeps the same clean at all times. This wire is designed to be projected through the orifice in the jet block whenever the valve stand 33 is moved forwardly into closed position. Corresponding to the interior diameter of the tube 13 is a coil wire 37 which is positioned around the rod 36 and extends from one end of the tube to and against the jet block 35. The purpose of this wire is to assist in the forward propulsion of the liquid fuel of the generating gas by capillary action so that a positive feed is secured. It will be obvious that the feed of the liquid fuel, or gas, is by means of an annular helical path surrounded or bound by the rod 36, the tube 13 and small coil wire 37 would operate to feed the liquid fuel and gas in a fairly satisfactory manner after once heated by the central burner which may be here designated 38, but preferably a distinct advantage is attained by expanding or enlarging the end of the generator tube, as at 34. This enlarged portion is provided with a larger coiled wire 39 which surrounds the coil wire 37, as is clearly shown in Figs. 3 and 8. It will be obvious that by utilizing this larger tube, which is enlarged at its effective part, and the additional coiled wire 39, that the liquid fuel will be conducted to the generating zone in a larger annular spiral stream, and the surface of the tube being considerably larger, it will further be obvious that a much larger surface is exposed to the heat from the burner 38, and a much larger amount of fuel is contained within the generating tube 13 between the valve housing

31 and the jet block 35. Thus, as far as normal operation of the stove is concerned, it will be obvious that when once operated, that a larger area and a larger amount of fuel may be more efficiently heated and thus positively and effectively vaporized or gasified, and also be expelled under greater pressure.

Another important feature of this design of generating tube is brought into play when the generating tube is used as a primer, or in other words, is used in combination with the combined preheating and mixing chamber to initiallly start the stove.

Taking up first the construction of the combined preheating and mixing chamber, it is preferably formed of a hollow casting which is so cored as to provide a conduit formation for conducting the vaporized gases to the main manifold, and also provided with cored portions 41 and 42 for conducting the air to a point adjacent the jet block when the same is in operating position. The unit or housing is also provided with suitable passageways 43 in the sides thereof which are formed by a suitable channel formation in the casting and suitable wings 44 which are positioned against such channel formations whereby to form a passageway for auxiliary air, as well as to form a shield against unnecessary drafts. The wings 44 are outwardly turned at their lower enlarged ends, as shown in Figs. 7 and 8, and the upper end of the passageway formed by the wings and the channels 43 cooperate with suitable air inlets 45 at each side of the upper end passageway 42. We thus have three separate air inlets adjacent the jet block 35, when so positioned in Fig. 3, one formed by the passageway 42 and the other two by the inlets 45 at each side of the casting. The casting is provided with a support or guide member 46 which is suitably secured thereto and which is adapted to support and guide the enlarged end of the tube 13, as best shown in Fig. 2. This support is positioned centrally of the top part of the casting, and the top part of the casting surrounding the support 46 is machined, that is, the inside of the walls are machined and the tapered boss 48 is machined.

Adapted to be hingedly connected to the casting forming the main part of the member 30, is an L-shaped member 50, the upper part of which may be designated 51 forms a U-shaped chimney structure, machined on the sides, as at 52, and on its tapered ends, as at 53, the machined sides 52 cooperating with the inner machined surface of the casting, and the machined ends 52 cooperating with the machined boss 48. The bottom leg of this L-shaped member 50 is formed into a shallow pan 54 and is provided with a suitable wick member 55, as shown in Figs. 2 and 7. This pan is designed to receive a small amount of liquid, as will be presently described, in order to initially start the stove. The connection between the leg 54 and the leg 52 is by means of a curved depression 56, which is so formed that the gases issuing flames from the jet block 35 are baffled and directed from the curved surfaces thereof backward against the enlarged portions 34 of the generating tube.

The upper end of the valve 50 is slidably connected with the grate member 24, as at 25, and when the combined preheating and mixing chamber is used as a preheating chamber, the grate is raised upwardly, as shown in Fig. 2, whereby the member 50 will be positioned as shown in Fig 2, and this position of member 50 transforms the combined preheating and mixing chamber into a preheating chamber when the generating tube is positioned at its innermost position as illustrated in Fig. 2. When the member 50 is moved downwardly into closed position whereby the machined parts are in contacting relation, as shown in Fig. 3, then the member 50 is transformed into a mixing chamber, the generating tube being withdrawn to the position shown in Fig. 3, whereby the vaporized, or generated gases, may be expelled from the jet block 35, and conducted through the passageway 40 towards the main manifold.

The fuel container 6 is preferably provided with a suitable pump 60 which is suitably secured to the container shell and which is connected to the interior thereof by means of a valve plug 61. The piston rod, or pump rod 62 is designed to be held in inwardly sealing position by means of a suitable lug 63, positioned on the container shell.

In operation, suitable pressure having been set up within the container by means of the pump 60, and the fuel supplying member being positioned inwardly, as shown in Fig. 2, the valve 32 is opened very slightly whereby a small amount of liquid fuel is introduced to fill up the generator and to expel a small amount of fuel just sufficient to moisten the wick member 55, the grate 24 and chimney 51 having been raised to open position. This liquid fuel in the pan 54 is ignited by any suitable means, and the enlarged end of the generator tube will be initially heated by the burning of the fuel in the pan. However, due to the extremely large heating surface of the portion 34 of the tube, and the directing of the flames from the pan 54 upwardly around the tube, by the chimney 52, the enlarged portion of the generating tube will be heated with sufficient intensity, and in a very few seconds, whereby pressure will be set up within the tube by the inherent gasification of some of the fuel in the tube. This gas will then be expelled under pressure and will be directed against the curved portion 56 whereby a blast will be created and directed rearwardly back against the enlarged portion 34. This blast will gradually increase in intensity and as the entire tube

13 holds a large amount of fuel as a result of its length and its enlarged portion, enough fuel being present, a sufficiently intense blast will be created so that the tube 34 will be sufficiently heated to cause any liquid introduced into the tube to be immediately generated into a gas without the necessity of again turning on the valve 32. In other words, it is only necessary to turn the valve on once to fill up the tube and after all the fuel has been expelled and the flame dies out, or before the dying out of the flame, the chimney 52 may be lowered by lowering the grate 54, and the fuel supplying unit may be moved to operating position corresponding to the position shown in Fig. 3. When in this position the jet block 35 is positioned within the housing, as shown in Fig. 3, and the enlarged part of the tube is positioned just over the burner 38, and by then opening the valve 32 the fuel introduced into the tube 13 will be immediately gasified, or vaporized, and this vaporized fuel emitted by the jet block will be conducted through the mixing chamber 30 and around the passageway 40 into the main manifold which leads to the burner 38. As the gasified fuel passes the air inlets 42 and 45, air will be drawn and mixed therewith to form the proper combustible mixture, these air inlets being predetermined as to size, as will later be described. This mixture being fed to the burner 38 and then ignited, the flames arising from such burner will then heat the enlarged portion 34 of the tube to cause continuous gasification of the fuel whereby the stove may be operated and regulated in a normal manner. It will be obvious that this structure, in addition to being a more efficient quick acting arrangement, is also a very safe arrangement, in that the valve 22 is not opened until the unit is in condition for normal operation. This is made possible by the fact that the tube 34 is enlarged and contains enough fuel to cause a blast to be directed against the outside of the tube without the necessity of opening the valve 32 and relying upon the pressure within the tank 6. In other words, the initial pressure for effecting the blast is inherently set up by the fuel within the generating tube. When the member 50 is lowered into closed position the lower leg serves as a deflecting member for deflecting the path of the gases as they are emitted from the jet block 35.

The jet block 35 is so positioned when the stove is in normal operation that it is shielded by the housing of the member 30, as shown in Fig. 3. This end of the jet block is therefore never heated up sufficiently to cause the adherence of carbon thereto due to the cooling action. Due to the positioning of the springs 34 and 39 within the generating tube, when the valve 32 is closed and the stove shut off, all of the gas therein will be expelled through the capillary action and no gases or fuel will be left in the tube to adhere and carbonize the interior walls of the tube. This, therefore, presents a structure which can be used for a relatively long time without requiring disassembling for cleaning.

The inwardly positioning of the fuel supplying means, as previously described, is so predetermined that the end of the jet block 35 is positioned at such position relative to the curved portion 56, as shown in Fig. 2, that the ejected stream of gas or fuel will strike the curve 56 at the proper point to be redeflected against the tube. When the generating tube is moved into operating position, as shown in Fig. 3, the stops 15, together with the latches 16, serve to lock the tube and position the jet block in the housing whereby the proper mixture and quality of fuel and air is obtained to effect the most efficient combustible mixture so as to obtain at all time a uniform blue flame. If the fuel supplying unit is not moved out far enough to cause the latches 16 to drop into position the operator would notice a yellow flame caused by the improper mixture with the air, and will then immediately move the fuel supply unit to its extreme locking position and thus obtain a blue flame.

The fuel distributing apparatus consists of a manifold and a cooperating burner structure whereby the gases when once formed, or vaporized are conducted to the burner in such a manner as to obtain the proper quality of fuel at each burner at all times independently of the relative operation of each burner. This fuel distributing system may be connected up with any suitable generating apparatus, but is particularly adapted with the combined preheating and mixing chamber, the generating apparatus forming a part of the present invention. This novel distribution of the fuel is obtained by means of a novel manifold which is best illustrated in Figs. 4 and 10. The manifold portion 40 of the mixing chamber 30 is secured to the manifold 65 by means of suitable screws 66, as shown in Fig. 10. This manifold 65 is provided with two main passageways 67 and 68 leading in opposite directions from the point of connection of the mixing chamber to the manifold. Such manifold is also provided with suitable passageways 69 and 70 which are connected at the ends thereof to the main passageways 67 and 68 by means of suitable rotary valves 71. The ends of the manifold 65 are provided with suitable upwardly extending projections 72 and are connected to the rotary valves by means of a suitable passageway 73.

The central part of the manifold is provided with an upwardly extending part 74 which is adapted to conduct gases to the center burner 38 from any or all of the passageways leading from the inlet passageway 40. In other words, the central passageway 75

which leads directly to the burner 38 is by-passed into the main passageway by means of a suitable by-pass 76.

The rotary valves 71 are provided with suitable apertures 78, which cooperate with the passageways 67 and 69 at one end, and 68 and 70 on the other end and the burner passageway 73 to direct the gases to the end burners, one of which is illustrated in Fig. 6, or to the passageways 69 and 70 which lead to the central burner. In other words, the rotary valves 71 are hollow and open at the end whereby all the gases passing through the passageways 67 and 68 are either directed to the end burners when the valves are turned off, or the gases passing thereto pass through the valves and into the passageways 69 and 70 where they are conducted to the central burner 38. In other words, instead of a lineal manifold, we have provided a continuously circulating manifold, whereby the correct quality of mixture having been once predetermined all the gases produced are continuously circulated. As a result we obtain no congestion of the gases, no back pressure, and no dead spaces to destroy the quality and proportion of the mixture.

The burners are preferably of the same size and are best illustrated by the burner shown in Fig. 6, which is an end burner and which may be designated 80. Each burner is surrounded by a radiating and air deflecting shield 81 whereby the heat is radiated upwardly and all unnecessary drafts are shielded and deflected. Positioned to extend into the passageways 67 and 68 are suitable pilot tubes 82 which are preferably closed at their upper end and are slotted, as at 83, to present orifice openings of relatively large size whereby a small pilot flame is continuously maintained at all times adjacent the burner 80. These openings are preferably slotted but may be formed by a plurality of small apertures effective to cause efficient burning of the pilot lights. But an additional feature which assists in maintaining the pilot lights is the fact that the gases are continuously circulated in the manifold whereby a proper quality of the mixture is maintained at all times adjacent the pilot light tubes, and a proper quality of the mixture of fuel is supplied to the pilot tubes to cause an even, continuous burning. It will be obvious, therefore, that any one of the burners other than the generating burner may be turned off as desired and relighted as desired by means of the pilot flames, and that when such burners are turned off, all the gases, except those utilized by the pilot light, are preferably circulated to the generating chamber positioned beneath the generating tube.

The valve handles controlling the operation of the auxiliary burners may be designated 85 and are preferably connected with the rotary valves by means of valve stems 86. The stove casing is provided with suitable pressed recesses at 87 for receiving these valve handles 85 whereby they are positioned within the surface of the casing where they are accessible at all times.

The air inlets 42 and 45 are so predetermined with relation to the generating unit and the gases emitted thereby that when one or all of the burners are going, sufficient air will be combined or drawn in to effect the proper quality of mixture. When one burner, or plurality of burners are therefore shut out and the gases by-passed into the generating burner, it will be obvious that there will still be a blue flame.

What we claim is:

1. A stove construction of the liquid fuel type, comprising a permanently supported burner structure, a combined pre-heating and mixing member secured thereto, and a fuel supply unit slidably mounted in the stove casing and movable as a unit to one position inside of the casing to cooperate with the pre-heating unit to initially vaporize the liquid fuel and then movable as a unit to a position outside the casing to cooperate with said mixing chamber and burner to maintain the fuel under normal operation.

2. A stove construction of the liquid fuel type, comprising a fuel container slidable within the stove casing, a generating conduit rigidly connected to said container, a valve for admitting fuel from said container to said conduit at the point of said connection, and a pre-heating member including means cooperating with said conduit when the container is moved to a position within the casing for directing flame from said generating conduit back against the conduit.

3. A stove structure, comprising a casing, a combined fuel supply container and conduit slidably mounted to move through a wall of said casing, a combined pre-heating and mixing member, said conduit being longitudinally movable to cooperate with said member, and means for positioning the conduit relative to said pre-heating and mixing member when utilized as a pre-heater.

4. A stove structure, comprising a casing, a combined fuel supply container and conduit slidably mounted to move through a wall of said casing, a stationary combined pre-heating member and mixing chamber cooperating with said conduit, and means for positioning the container and conduit in a predetermined position relative to the combined pre-heater and mixing chamber when utilized as a mixing chamber.

5. A stove construction, comprising in combination, a plurality of permanently positioned burners and a fuel supply unit consisting of a container and a generating conduit movable in a horizontal plane and slidable as a unit in constant alignment with and relative to one of said burners.

6. A stove construction, comprising in combination, a plurality of permanently positioned burners, a blast deflector and a mixing chamber and a fuel supply unit consisting of a container and a generating conduit slidable as a unit relative to one of said burners, said unit being movable in a horizontal plane and slidable within the stove frame to cooperate with the blast deflector to serve as a preheating unit and being slidable exteriorly of the frame to cooperate with a mixing chamber to serve as a normal generating unit.

7. A stove construction, comprising in combination, a plurality of permanently positioned burners and a fuel supply unit consisting of a container and a generating conduit slidable as a unit relative to one of said burners, said unit being movable in a horizontal plane and slidable within the stove frame to serve as a pre-heating unit and being slidable exteriorly of the frame to serve as a normal generating unit, and a shield forming an integral part of said slidable unit for shielding the container from the heat of said burner or burners.

8. A stove construction, comprising a slidably mounted generating unit and a combined pre-heating member and mixing chamber cooperating therewith, a part of said combined preheating unit being secured to the stove grate whereby raising the grate will transform the combined pre-heating member and mixing chamber from a mixing chamber to a pre-heating unit.

9. A stove construction of the liquid fuel type, comprising a stove casing a fuel supply unit slidably mounted within said stove casing, a generating tube secured thereto, a stationary mixing chamber in constant axial alignment with said tube, and means for positioning the fuel supply unit in a predetermined position whereby said generating tube and mixing chamber are properly positioned to provide a proper quality of combustible fuel.

10. A stove construction, comprising a housing, a fuel supply unit slidably mounted and supported within said housing, the means for slidably supporting the fuel supply unit also stationary supporting the burner structure and manifold structure, whereby the parts including the fuel supply unit, burner and manifold are supported as a common unit within the housing.

11. A stove structure, comprising a housing, fuel supplying means comprising a container and generating conduit slidably supported as a unit by said housing, and a shield mounted on said unit and positioned adjacent the container to serve as a heat deflector shield when said unit is moved to operative position.

12. A stove construction, comprising a plurality of stationary burners, a housing forming a mixing chamber positioned relative to one of said burners, and a slidable fuel supply unit having a generating conduit slidable within and guided by said housing, a manifold structure for directly connecting said burners, and means for connecting said housing to said manifold whereby to supply said burners.

13. A stove construction of the liquid fuel type, comprising a combined pre-heating member and mixing chamber, a pivoted grate, and means for slidably connecting part of the wall of said chamber to said grate.

14. A stove construction of the foldable type, comprising a case for enclosing and carrying the same, a fuel supplying unit separate from the burners and slidable through a wall of said case, part of said case being hinged to permit said sliding of said unit, said hinged portion being folded to close the case and to serve as a handle supporting portion when the case is closed.

15. A foldable stove structure comprising a stove framework and a track structure secured therein, and a fuel supplying means including runner members slidable within said tracks, said stove structure including a mixing chamber and said fuel supplying unit including a generating conduit, and roller members between said runner members and said tracks whereby said fuel supplying unit will have a free horizontal movement and will be accurately guided to position the generating conduit relative to the mixing chamber.

16. A stove construction of the liquid fuel type, comprising a casing, a burner positioned therein, a mixing chamber having an entrance head for receiving fuel and air, a preheating member in alignment with said entrance head, and a fuel supply unit comprising a fuel container and a generating tube rigidly mounted thereon, said unit being horizontally slidable into and out of the casing, the end of said generating tube being positioned adjacent the entrance head of said mixing chamber when said supply unit is positioned outside of the casing, and being movable through said entrance head and positioned adjacent said preheating member when said fuel supply unit is positioned inwardly of the casing.

17. A stove construction, comprising a casing having side frames and a hinged lid, a fuel supply unit consisting of a tank and generating tube mounted thereon and at right angles thereto, a burner, a mixing chamber for conducting combustible fuel thereto and having an entrance head, and a preheating member, said burner, entrance head and preheating member being positioned in alignment with each other and with said generating tube, said unit being slidable through the stove frame whereby to position the end of the generating tube over the burner adjacent the entrance head or

move the same through the entrance head and adjacent the preheating member.

18. A stove structure, comprising a casing, a combined fuel supply container and conduit slidably mounted within said casing and movable through a wall thereof, a combined preheating member and mixing chamber cooperating with said conduit, and means for positioning said container and supply conduit relative to a part of said preheating member and mixing chamber when utilized as a preheater, and means for positioning said container and supply conduit relative to another part of said combined preheating member and mixing chamber when utilized as a mixing chamber.

19. A foldable stove structure, comprising a casing made up of side walls on the bottom and a hinged top, part of one of said side walls being hinged and movable to present an aperture, a fuel supply unit slidable through said aperture, said hinged portion of the side wall cooperating with said hinged top, whereby said hinged portion will be held in assembled position to complete the stove casing when said hinged top is in closed position.

In testimony whereof we affix our signatures.

CHARLES F. LAMBERT.
WILLIAM BLASKEWITZ.
CLARENCE BURT OVERLY.
JAMES IRONSIDE.