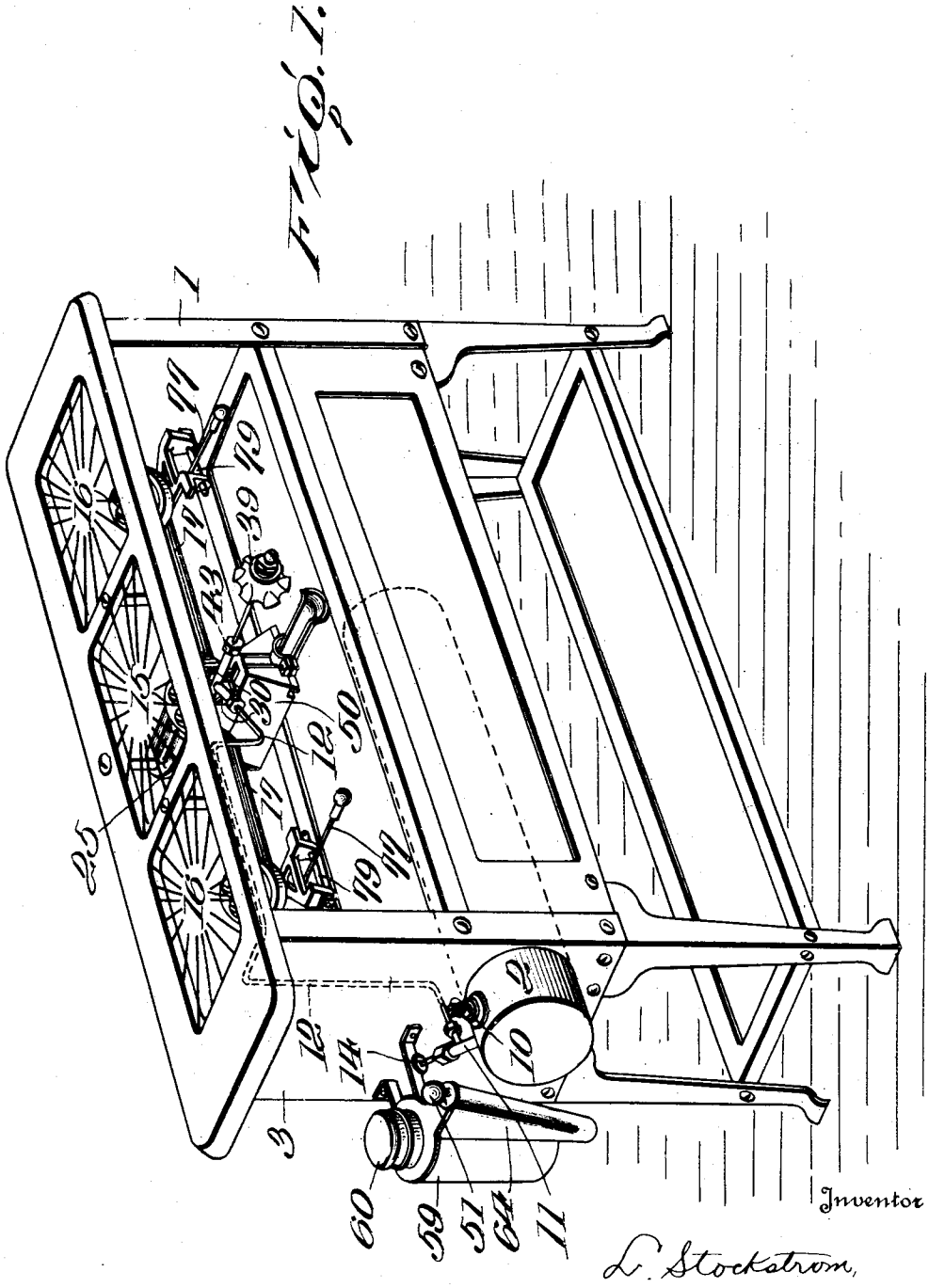
Jan. 18, 1927. 1,614,854

L. STOCKSTROM

HYDROCARBON STOVE AND BURNER THEREFOR

Filed June 2 1925 7 Sheets-Sheet 1

Fig. 1.



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HYDROCARBON STOVE AND BURNER THEREFOR

Filed June 2, 1925 7 Sheets-Sheet 2

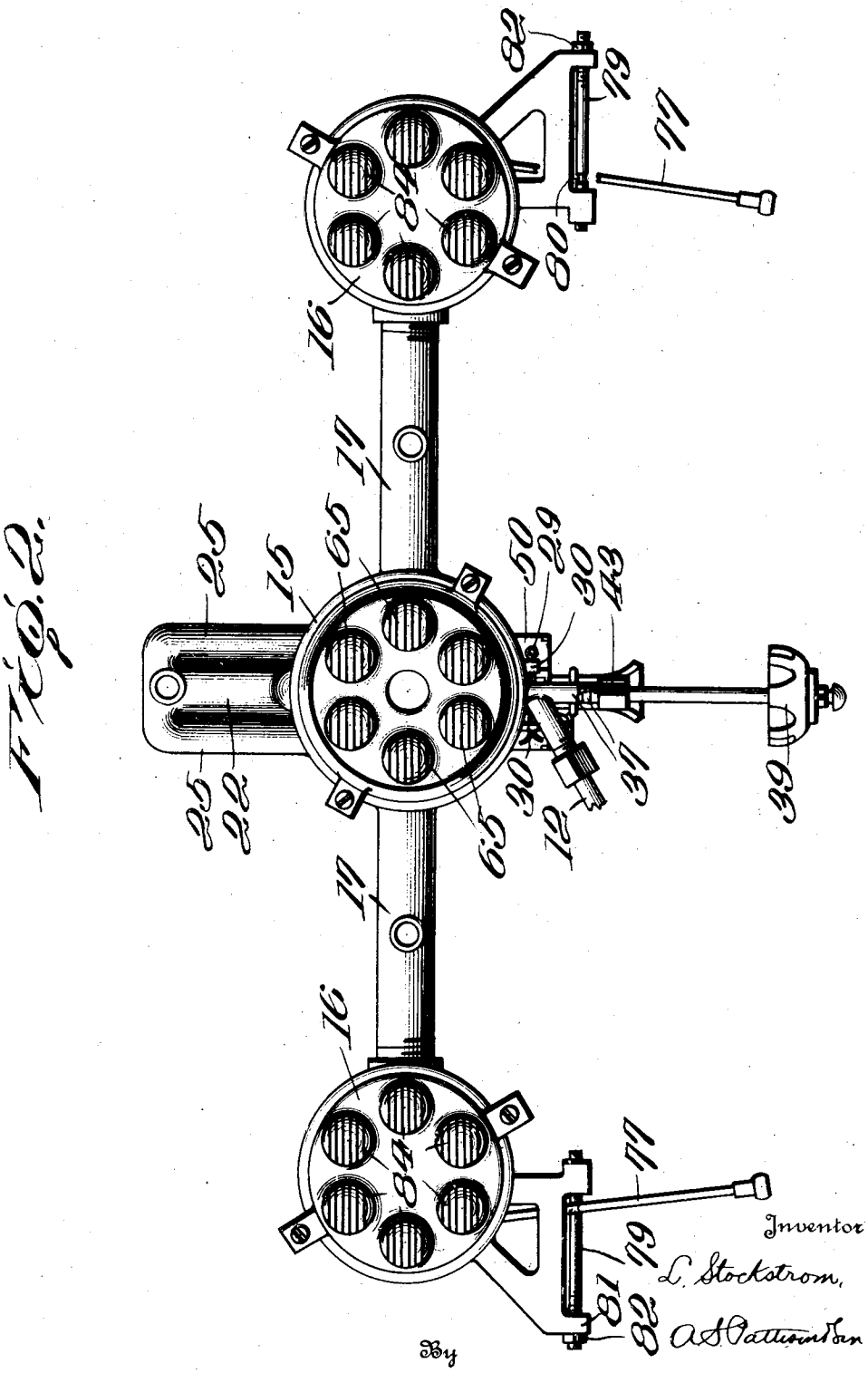


FIG. 2.

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HYDROCARBON STOVE AND BURNER THEREFOR

Filed June 2, 1925 7 Sheets-Sheet 3

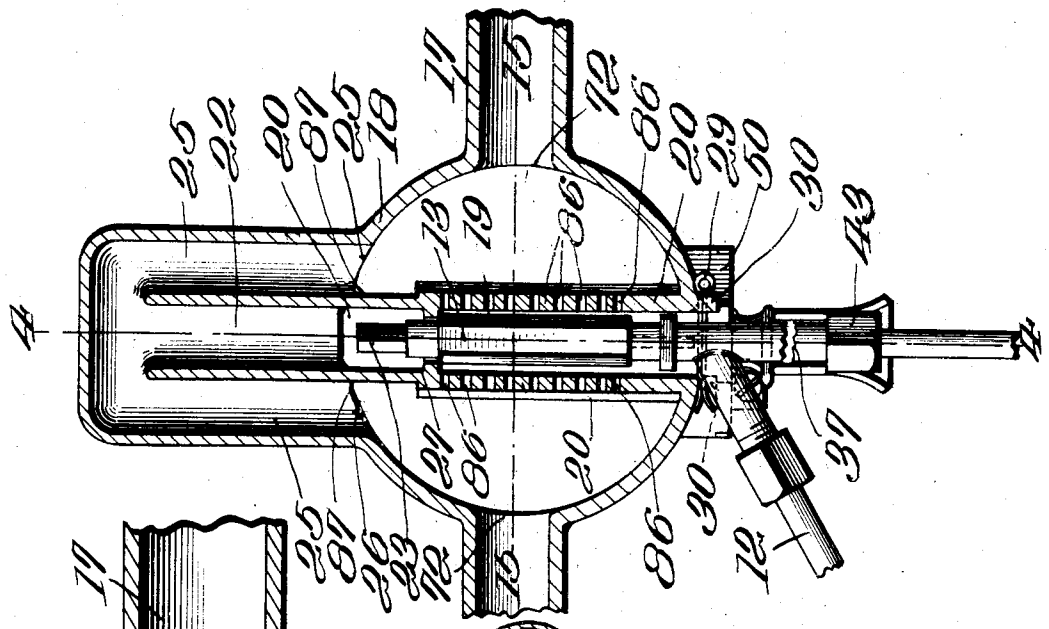


Fig. 3.

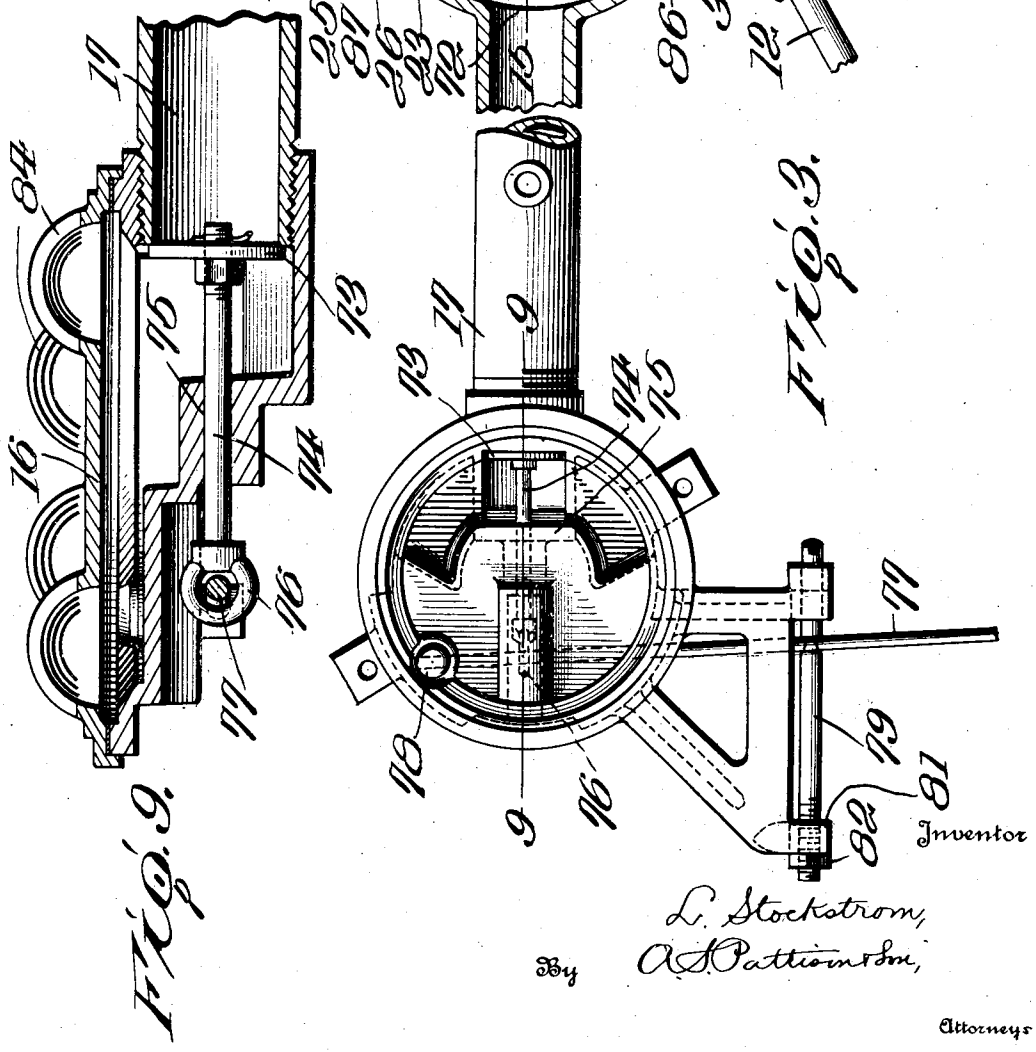


Fig. 2.

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Filed June 2, 1925 7 Sheets-Sheet 4

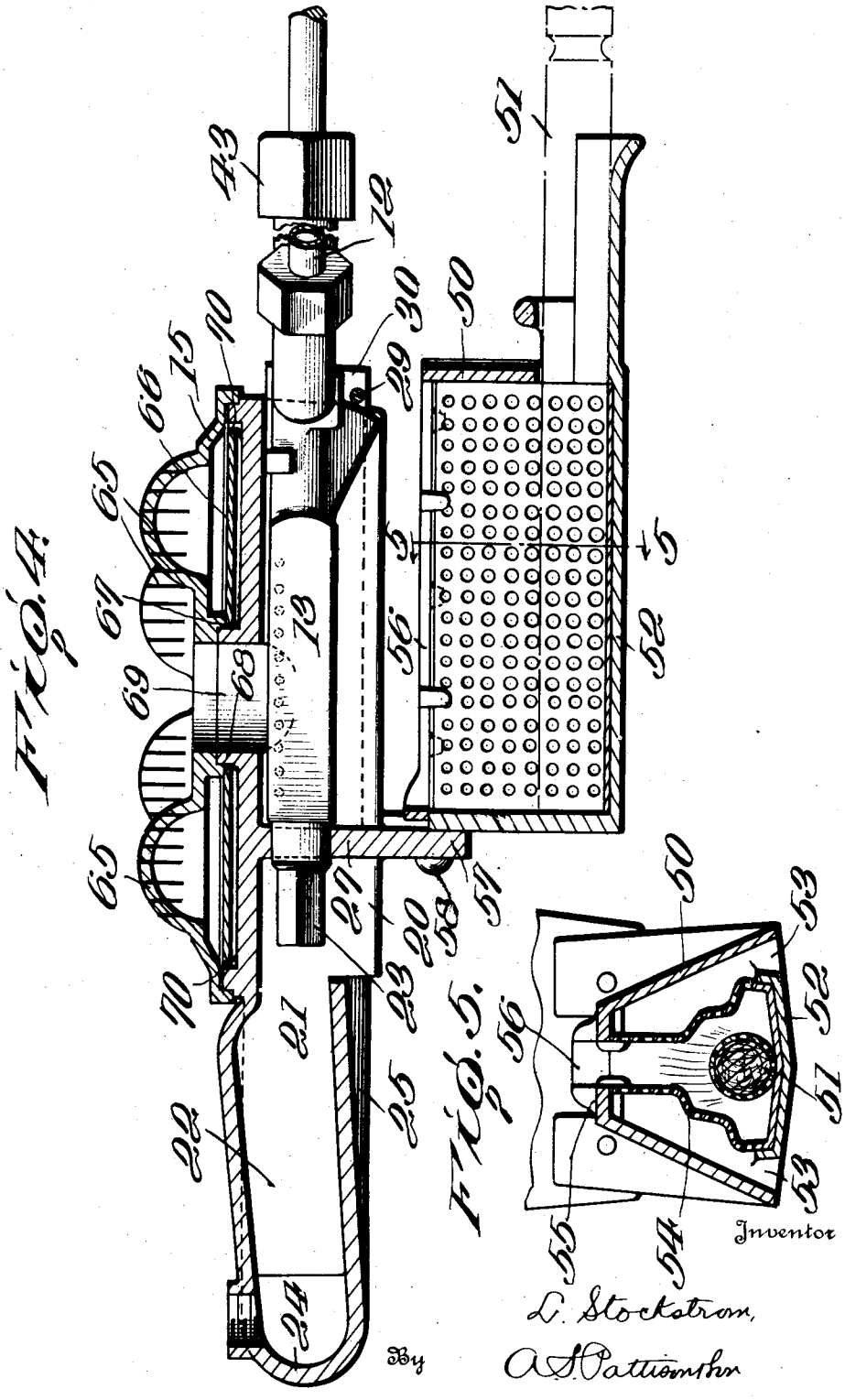


Fig. 4.

Fig. 5.

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HYDROCARBON STOVE AND BURNER THEREFOR

Filed June 2, 1925 7 Sheets-Sheet 5

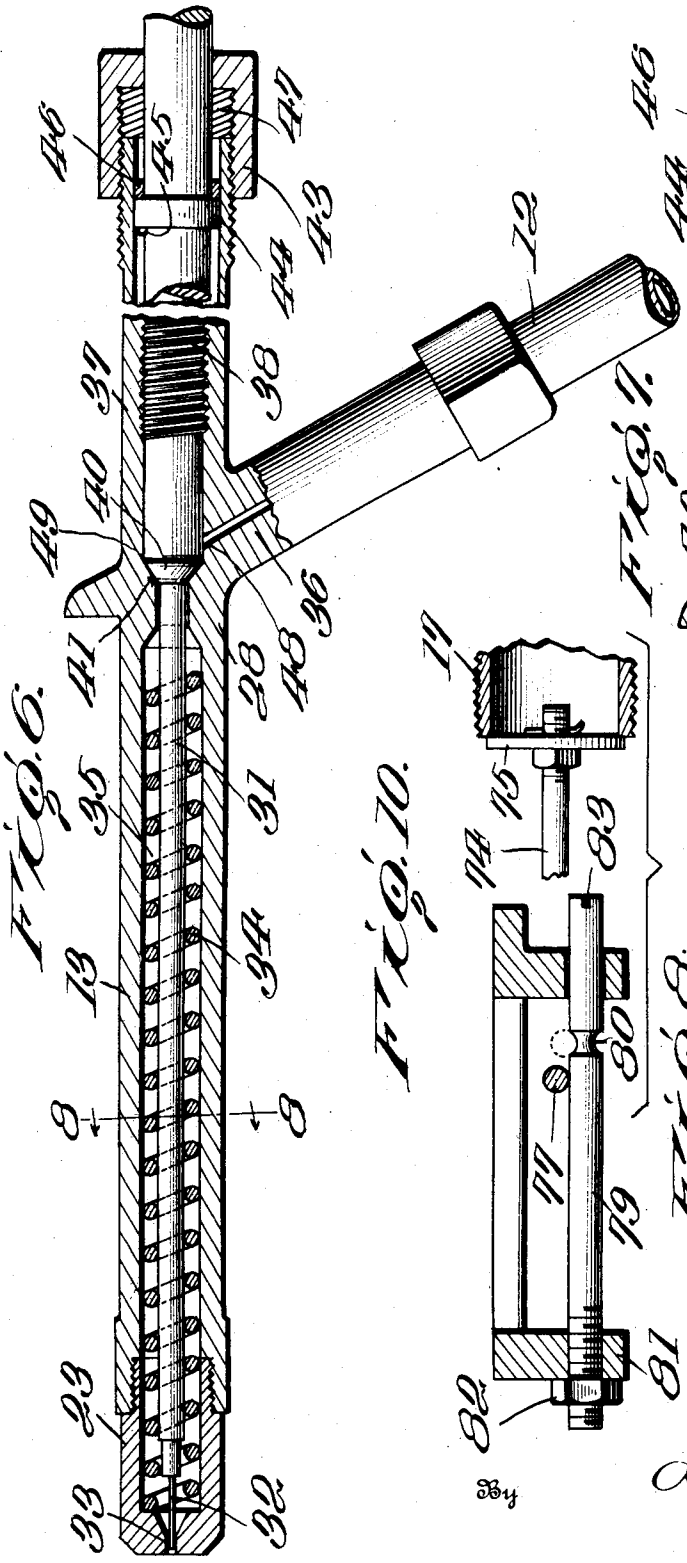


FIG. 6.

FIG. 10.

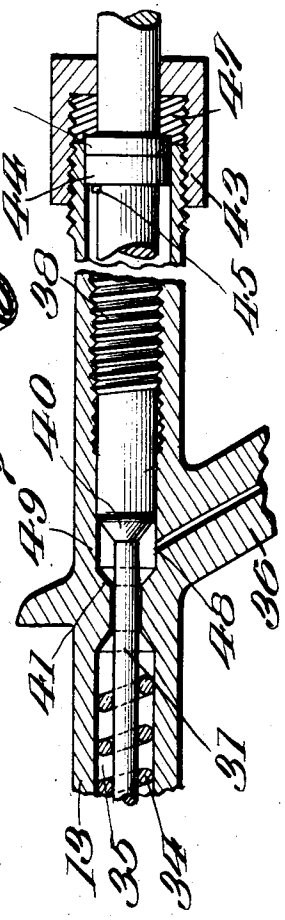


FIG. 7.

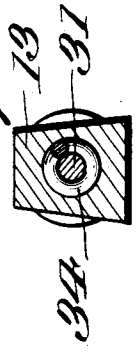


FIG. 8.

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HYDROCARBON STOVE AND BURNER THEREFOR

Filed June 2, 1925 7 Sheets-Sheet 6

Fig. 11.

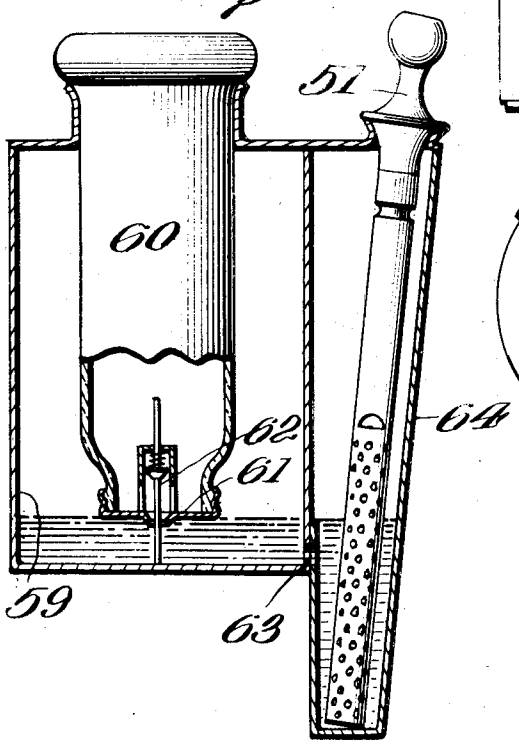


Fig. 12.

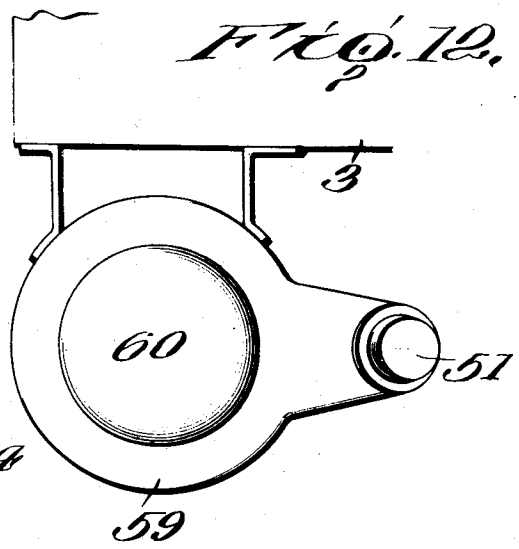
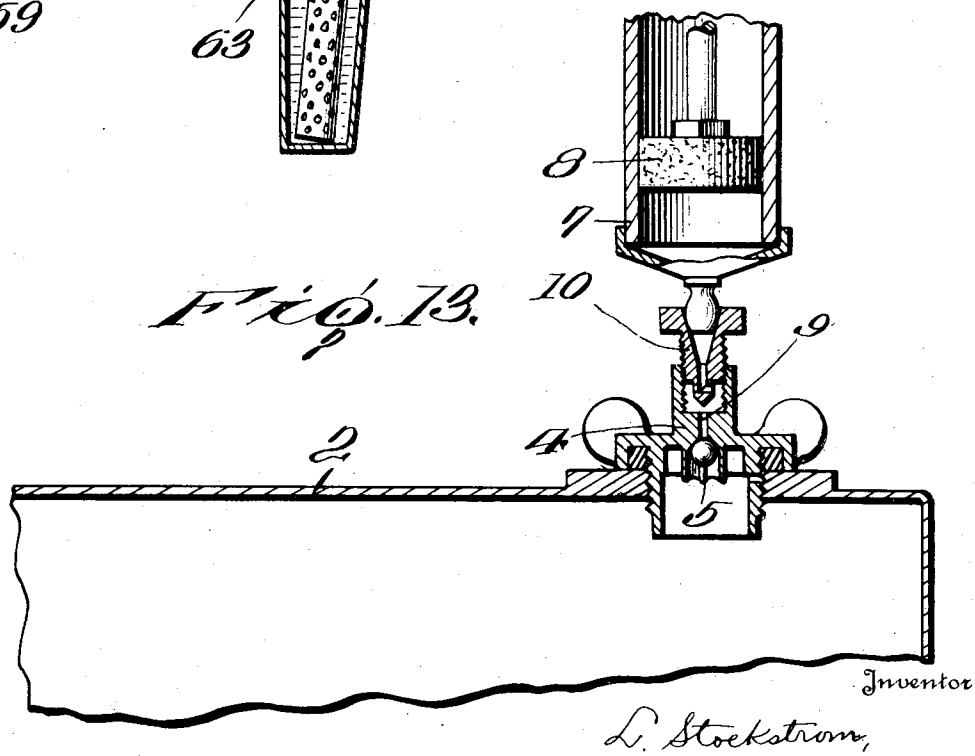


Fig. 13.



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HYDROCARBON STOVE AND BURNER THEREFOR

Filed June 2, 1925 7 Sheets-Sheet 7

FIG. 14.

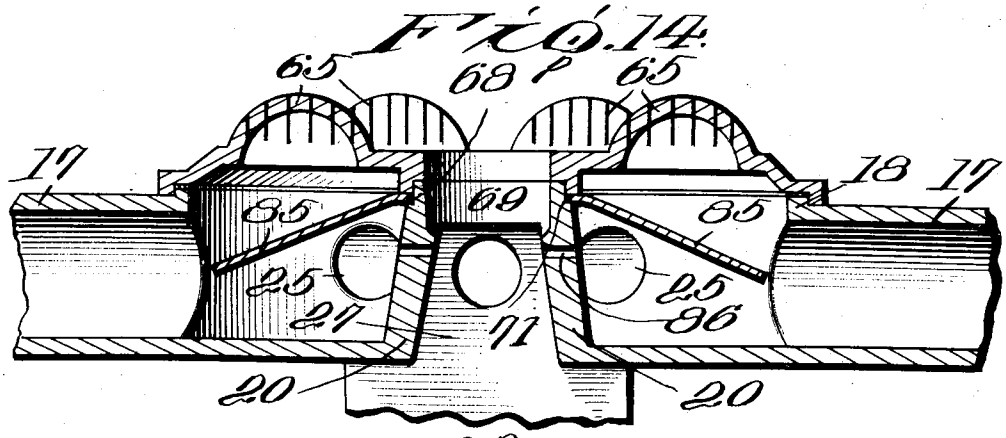
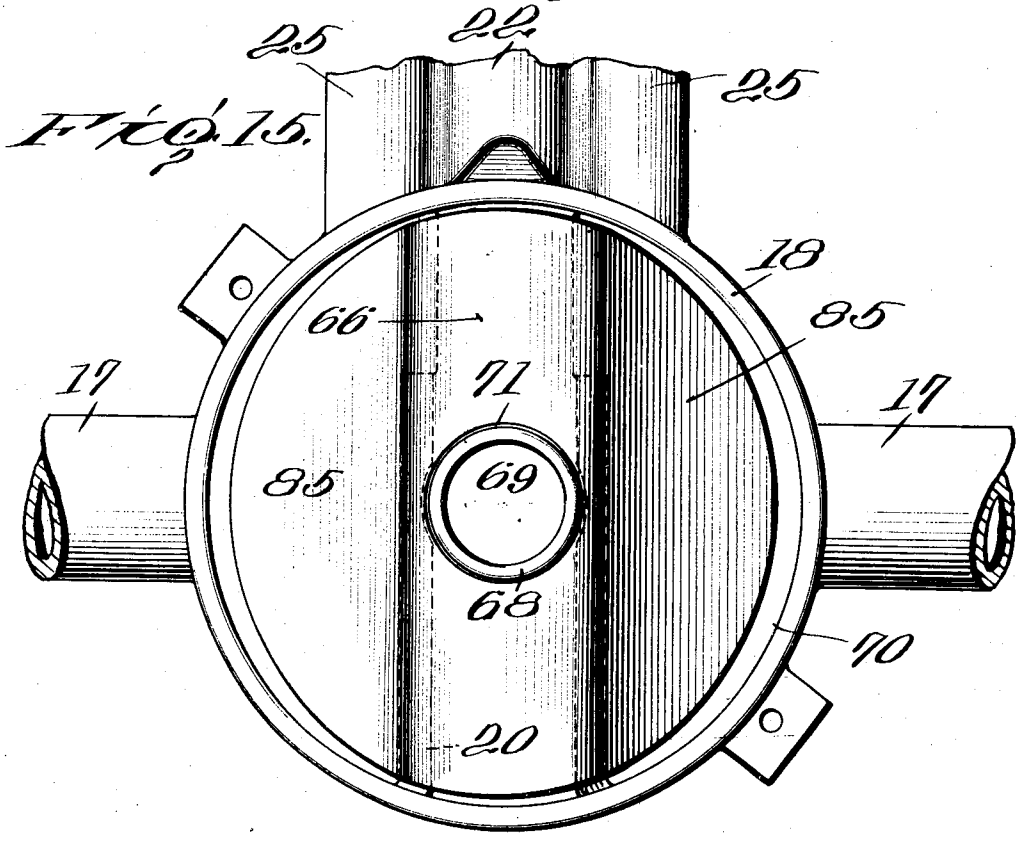


FIG. 15.



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Patented Jan. 18, 1927. 1,614,854

UNITED STATES PATENT OFFICE.

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HYDROCARBON STOVE AND BURNER THEREFOR.

Application filed June 2, 1925. Serial No. 34,355.

This invention relates to improvements in hydrocarbon stoves and burners therefor and has relation to that type of stove in which the liquid fuel supply is forced by pressure to a generator from which it is supplied to a burner or burners where it is lighted.

An object of the present invention is to provide a generator that is located within a main burner whereby the generator when it is once started is kept heated by a flame in the main burner whereby the vapor is necessary for operating the burner, and other burners is supplied.

Another object of the present invention is to conceal within the main burner a generator whereby when it is once started the heat from a flame in the main burner keeps the generator hot for supplying vapor to the main burner and from the main burner to additional burners.

Another object of my present invention is to provide a distributing chamber with a generator concealed therein, the main burner having a mixing chamber extending to one side thereof and in communication with the distributing chamber whereby the generator supplies vapor to the mixing chamber from which it flows into the distributing chamber for supplying a flame that continues to keep the generator hot and supplies additional vapor to other burners which are connected with the main burner.

A further object of the present invention is to provide the housing for the distributing chamber and the main burner having an upwardly extending transversely arranged generator receiving chamber that has an open bottom with an outlet at the top whereby the generator is heated from below and is kept heated by the heat from a flame in the main burner for supplying vapor for the main burner and additional burners.

A further object of the present invention is to provide the housing of the distributing chamber with an inverted U-shaped chamber extending across the same in which chamber is located a generator and located below the generator is a heating device adapted to receive a torch for heating the generator, the generator being kept hot by the flame supplied from the distributing chamber and the main burner when it has once been heated.

A further object of the present invention is to provide the housing of the distributing chamber with an inverted U-shaped chamber extending transverse thereof, the said chamber having open ends and bottom and adapted to receive a generator, and to provide the wall of the main burner with a mixing chamber having its inner end open and in communication with the U-shaped chamber, the outer end of the chamber doubling back and in communication with the distributing chamber, whereby vapor passing into the chamber carries with it air that is mixed and forms a combustible gas for all of the burners.

Another object of the present invention is to provide a housing, the bottom of the housing having an inverted U-shaped chamber in which is placed a generator, the said chamber having an open bottom and an open end for the outlet of the generator, and to provide the wall of the housing with a mixing chamber comprising a center portion and two parallel side portions, the center portion being in communication with the generator and the two side portions in communication with a distributing chamber at opposite sides of the inverted U-shaped chamber.

A further object of the present invention is to provide a housing with a generator, and having lateral pipes connecting with additional burners whereby more vapor is supplied than is necessary for the main burner, the surplus vapor flowing into the additional burners, and controlling the flow of vapor into the additional burner by a valve or valves located in the additional burner or burners.

Other objects of the invention will appear from the following description:—

In the accompanying drawings:—

Figure 1 is a perspective view of a stove embodying the present improvements.

Figure 2 is a detached top plan view of the improved burners.

Figure 3 is a plan view partly in horizontal section of the distributing chamber and one of the additional burners.

Figure 4 is a vertical center sectional view through the center of the housing for the distributing chamber and the main burner showing the generator and the improvements for initially heating the generator.

Figure 5 is a transverse sectional view on

line 5—5 of Figure 4 showing the torch receiving member for initially heating the generator.

Figure 6 is an enlarged center horizontal sectional view of my improved generator, its valves, etc.

Figure 7 is an enlarged horizontal sectional view of the valve showing the manner of its operation.

Figure 8 is a sectional view on line 8—8 of Fig. 6 looking in the direction indicated by arrow.

Figure 9 is a vertical center sectional view through one of the additional burners showing its valve for controlling the flow of vapor into the burner.

Figure 10 is a sectional and side view combined of the means for controlling the valve for one of the additional burners.

Figure 11 is a vertical sectional view of the torch holder and fuel feeding device for the torch.

Figure 12 is an enlarged top plan view of Figure 11.

Figure 13 is an enlarged sectional view showing the hand pump in position for supplying air pressure to the tank.

Figure 14 is a transverse sectional view through the housing for the distributing chamber and the main burner showing the inverted U-shaped generator chamber.

Figure 15 is a top plan view of the main burner with the burner plate removed showing the baffle plate and the air space around it.

Referring now to the drawings in which 1 indicates a suitable frame for the parts comprising the present invention. Located in the frame 1 about midway the height thereof is a horizontal fuel supply tank 2, the said tank extending within the frame of the stove, and its outer end projecting beyond the end 3 whereby it is readily accessible. The tank 2 has at its extended end a communication 4 having a suitable ball valve 5 held to its seat by air pressure within the tank 2. The tank is supplied with oil and then the pump 7 placed over the nipple 10 which has communication with the passage 9 of the connection 4 and then working the plunger 8 in the ordinary manner forces air past the ball valve 5 into the tank 2. The oil container in the tank is then under pressure and flows from the tank through the pipe 11 to the pipe 12 and then into the generator 13. A valve 14 is preferably placed at the junction of the pipe 12 with the pipe 11 which controls the pressure fed from the tank 2 to the burner.

Referring to Figure 2 in which 15 is the main burner and 16 are two additional burners that are connected with the distributing chamber located at the lower part of the housing by suitable pipes 17. The vertical wall 18 forms a vertical housing and the bottom 19 of the housing is provided with an inverted U-shaped chamber 20 for the reception of the generator 13. This inverted chamber 20 has its bottom open and its end 21 connected with a centrally arranged vapor and air receiving and mixing chamber 22. The nozzle end 23 of the generator 13 is therefore in communication with the inlet end 21 whereby as the vapor flows through the opening 21 into the combined vapor and air mixing chamber 22 air is entrained therewith through the opening 20. This air and vapor strikes the outer end 24 and is caused to flow laterally in opposite directions through the passageways 25 of the vapor and air mixing chambers. By the time the vapor has reached the inner outlet ends 26 of the passageways 25 the air and vapor are thoroughly mixed and form a combustible composition for burning purposes.

The generator 13 is placed in the inverted U-shaped chamber 20 and its nozzle end 23 passes through and rests on a support 27 thus holding the nozzle end in position while its inlet end 28 is held in position by a suitable cotter pin 29 that passes through ears 30 that extend outward from the side wall 18 of the main burner. This makes the generator readily separable for any purpose whatever.

The generator preferably is rectangular in cross section as shown in Figure 8, and consists of a tubular construction. The nozzle 23 is detachable from the inner end of the tubular portion 13 for purposes of convenience in manufacture and cleaning. The valve stem 31 is elongated and passes through the tubular portion 13 and carries at its outer end a suitable pin 32 which passes through the outlet 33 for the purpose of cleaning it of accumulated carbon. Placed around the valve stem 31 and preferably snugly fitting it is a spiral wire 34 the outer periphery of the wire also snugly fitting the opening 35 of the tubular member. The outer end 28 of the generator has an oil inlet 36 with which the outlet end of the pipe 12 is connected. The inlet end of the generator also has an additional outwardly projecting tubular portion 37 which receives the outer end of the valve stem. This outer portion of the valve stem is screw-threaded as at 38 and meshing with internal screw threads formed on the member 37, the outer end of the valve having any desired form of hand operating member 39 rotating it.

Attention is called to the fact that the valve stem is provided with a valve 40 located at the oil inlet 36. This is the only valve that the valve stem contains and it is by means of this valve, and this valve alone that the passage of vapor is controlled

from the generator to the main burner for maintaining the desired height of flame. It will be observed that this valve 40 engages the seat 41, and controls the flow of oil to the inlet end of the generator tube 13, and in that way controls the vapor generated.

The valve stem has at the outer end of the threaded portion 38, a suitable member 44 which is held against longitudinal movement thereon preferably by a projection 45 extending from the valve stem. A suitable ring 46 is located at the outer end of the member 44 for the purpose of engaging the packing 47 when the valve is opened as shown in Figure 7. This arrangement prevents the valve from being entirely screwed out of its tubular portion 37. It prevents anyone from detaching this valve from the burner thus causing possibly an accident. The object of the ring 46 is that the ring will remain stationary when it reaches the packing 47 so that wear on the packing does not happen. With the valve entirely wide open so that all the burners are burning full this ring will prevent any oil finding its way out as will be readily understood.

Located below the main burner 15 is an initial heating device 50. This device is for the purpose of receiving a torch member 51. The device is in the form of a chamber that has a bottom 52 and at each side of the bottom are longitudinal slits 53. A perforated member 54 is located between the bottom 52 and the top 55, the said construction forming an outlet opening 56. This device is supported to a web 57 extending downward from the nozzle receiving member 27 by a suitable screw or screws 58 passing through it into the end of the member 50.

A torch holding member 59 is attached to the end of the stove and it consists essentially of an outer casing containing an inverted member 60, preferably of glass, the cap 61 having a spring actuated valve member 62 whereby when the bottom is placed in position the valve is unseated and gasoline flows into the member 59 and through an opening 63 into the torch receiving part 64. By this means the torch is always saturated ready to be lighted in the manner presently described. When the torch is in position the whole device is sealed so that there cannot be accident by fire.

The generator 13 is to provide sufficient vapor for the main burner 15 and additional burners 16. Therefore it is essential in the construction here shown that the main burner 15 be so internally constructed that only that part of the vapor necessary for its proper operation can flow to the burner openings 65. In the improved burner I provide for this by means of a baffle plate 66, the said baffle plate having an opening 67 fitting around a center projection 68 that forms a center opening 69 in the top of the inverted U-shaped member 20. This baffle plate 66 therefore is located inside of the burner cap that has the openings 65. It will be observed that the baffle plate 66 divides the housing 18 into a main burner chamber above the baffle plate and into a distributing chamber below the baffle plate 65, the mixing chamber openings 25 communicating with the distributing chamber, therefore the gaseous mixture that is made in the mixing chamber 22 flows to the distributing chamber below the baffle 66 and from this chamber the gaseous mixture is supplied to all of the burners including the main burner. It flows from this distributing chamber past the edges of the baffle plate to the main burner chamber above it, and it flows from the distributing chamber below the baffle plate into the tubes 17 through which it is conveyed to the auxiliary burners 16, and it flows around the deflected part 85 of the division plate up into the main burner chamber, and the baffle plate 66, fitting loosely in the housing, some of it flows around the remaining periphery of the baffle plate to the main burner chamber. It will be observed therefore, that the generator is adapted to feed the vapor to the mixing chamber, while the mixing chamber feeds the gaseous mixture into the distributing chamber of the housing 18 from which it is distributed to all of the burners including the main burner. The baffle plate is of such size as to leave around its periphery a space 70 for the flow of the hydrocarbon vapor or gas, and also a space 71 around its inner opening 67 whereby sufficient vapor or gaseous fuel passes upward past the two openings for supplying the necessary combustible mixture for burning at the burner openings 65. At the same time this plate holds within the distributing chamber a sufficient quantity of the gaseous fuel to supply the additional burners 16 so that it flows readily through the unimpeded openings 72 into the burners 16. It will be understood of course that the amount of vapor or fuel passing to the burner 65 can be regulated and controlled by this baffle plate 66.

I have found however that by providing the openings 70 and 71 a proper flow of gaseous mixture is supplied to the burner openings 65.

Attention is called to the fact that the opening 69 passes entirely through the said housing and is located above the torch holding member 59 whereby the burner slits 65 and the sub-fire burner openings 86 are lighted by the flame from the initial heating torch 51. The principal function of the opening 69 is to establish a communication from the torch below whereby its flame not only plays on the generator 13 and lights the sub-fire 86, but passes through the opening 69 and serves in that way to light the

vapor escaping from the burner when the generator stem 39 is opened, which permits the vapor to escape from the generator and reach the burner slits 65 in the manner herein explained.

The gaseous fuel passing through the pipes or passageways 17 to the burners 16 is controlled by means of valves 73 that fit against the end of the pipes 17. These valves have their stems 74 passing through suitable openings 75, and the outer ends of the valve stems 74 are provided with eyelets 76 through which an operating rod 77 passes. This operating rod 77 has its outer end fitting into a suitable swivel 78 whereby the rod may be moved back and forth across an adjustable member or rod 79. This rod 79 is provided with a suitable groove 80 into which the rod 79 springs. It will be understood that this rod 77 has considerable spring between its ends, and the object of that is that the valve can be caused to seat against the end 17 of its pipe, and when against the end of the pipe the rod 77 will be in the position shown in solid lines in Figure 10, and then can be sprung further into the groove 80 thus holding the valve closed under spring tension, while at the same time the valve can be opened more or less and held in its adjusted position by the friction of the rod 77 with the rod 79.

This rod 79 is longitudinally adjustable by providing one end with screw-threaded portions that screw through a downwardly extending portion 81 carrying on its outer end a lock nut 82. By turning this rod 79, for instance by a screw driver engaging the slot 83, the rod may be turned to cause more or less spring tension against the valve when the operating rod 77 is in the groove 80.

The object of the coil 34 is to cause the flowing oil to travel in the spiral groove formed by the wire in its passage through the generator so that it is thoroughly vaporized when it passes through the outlet nozzle 33. At the same time it is found advantageous in obviating to some extent the formation of carbon in the vaporizer, and can be removed should the generator be affected by carbon and washed or cleansed or a new wire put in its place, and at the same time a new nozzle may be placed on the generator when occasion for it makes it necessary.

The form of burner openings here shown is the preferred construction and it is found to operate most satisfactorily. It comprises bulbs that are slotted as at 84 and 65.

When the burners are in operation a subfire for heating the generator 13 is maintained in the inverted U-shaped chamber 20 for heating the generator 13. This flame is maintained by the passage of the fuel from the distributing chamber into the space between the depending portions 85 of the baffle plate 66. This hydrocarbon gas flows from the distributing chamber through the openings 86 formed in the upper part of the wall of the U-shaped chamber into the chamber below the baffle plate 66 and substantially against the generator 13 thereby keeping the generator hot for vaporizing the oil fed thereto. By reason of this construction when the burner is once started then a heating flame is maintained through the openings 86 in the U-shaped chamber that substantially plays against the generator for continuously heating it during the operation of the burner. When the burner is cut off by closing the valve 40 then this subsidiary heating flame is likewise cut off.

The operation of the device is as follows:—

The liquid in the tank 2 being under air pressure and the valve 14 opened it flows through the pipe 12 into the generator through the oil inlet 48. The operator then removes the torch 51 from its holder, lights it and pushes it in the holder 50 where a flame will burn due to the perforated member 54 supplying the necessary oxygen. The flame passes through the opening 56 at its top and strikes the generator 13. When the generator has become heated the valve stem 39 is rotated causing the valve 40 to become open when the oil passes into the generator and is converted into vapor that passes through the nozzle 33. The burner now being in operation the gaseous fuel passes into the distributing chamber, and through the openings 86 supplies a constant flame within the inverted U-shaped chamber to play on the generator to heat it which continues the vaporization of the oil for supplying the burners until the valve 40 is closed.

I have described, and have shown in detail the construction of the mechanism whereby the foregoing results are obtained. However, many modifications and changes in the construction herein shown may be made without departing from the spirit and scope of the invention, so long as the modifications are within the scope of the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. A hydrocarbon burner comprising a horizontal shallow housing having a horizontal division plate dividing the housing into a horizontal lower distributing chamber and an upper main burner chamber, the distributing chamber and the said burner chamber located within the said housing, the distributing chamber communicating with the main burner chamber, a mixing chamber projecting laterally and horizontally from said housing, a generator in the same horizontal plane as the mixing chamber and communicating therewith, said mixing chamber communicating with the atmos-

phere and with the distributing chamber, the parts operating as specified.

2. A hydrocarbon burner comprising a distributing chamber, a burner chamber above the distributing chamber, a generator located within the distributing chamber, a conduit having its inner end communicating with the distributing chamber and carrying a burner at its outer end, the generator adapted to feed gaseous mixture to the distributing chamber from which it is distributed to both of said burners.

3. A hydrocarbon burner comprising a distributing chamber, a burner chamber located thereabove, a generator chamber within the distributing chamber, a generator therein, a mixing chamber having one end in communication with the generator chamber and its opposite end communicating with the distributing chamber, a conduit in communication with the distributing chamber and carrying at its outer end a burner whereby both of said burners are supplied from the distributing chamber.

4. A hydrocarbon burner comprising a housing including a distributing chamber and thereabove a main burner chamber in communication therewith, an auxiliary burner communicating with the distributing chamber, a generator extending across the distributing chamber below the said main burner chamber, a horizontal mixing chamber extending horizontally from the housing, the inlet end of the mixing chamber communicating with the atmosphere and the outlet end of the mixing chamber communicating with the said distributing chamber, the parts combined for the purpose described.

5. A hydrocarbon burner comprising a housing the lower portion thereof forming a distributing chamber and its upper portion a main burner chamber, a generator passageway extending horizontally across and within the distributing chamber, a mixing chamber projecting horizontally from the said housing, a generator in the generator passageway, the walls of the passageway provided with openings for furnishing a flame to heat the generator, said mixing chamber consisting of three parallel passages, the inner end of the central passage communicating with the atmosphere and in a line with the generator passage, and the other passageways communicating with the distributing chamber.

6. A hydrocarbon burner comprising a housing having its lower portion forming a distributing chamber and its upper portion forming a main burner chamber in communication with the distributing chamber, an auxiliary burner communcatng with the distributing chamber, parallel walls extending across and within the distributing chamber forming a generator passageway, the said walls having openings to furnish flame to heat a generator, a generator within the passageway, and a mixing chamber projecting horizontally from the said housing, having an inlet end in communication with the generator and its outlet end in communication with the distributing chamber, whereby the distributing chamber supplies fuel for all of the said burners.

7. A hydrocarbon burner comprising a housing, the lower portion forming a distributing chamber and its upper portion forming a main burner chamber in communication with the distributing chamber, an auxiliary burner in communication with the distributing chamber, a generator passageway within the distributing chamber comprising inverted U-shaped walls, a generator within the passageway, said U-shaped wall having passages to supply flames for heating the generator, an auxiliary burner in communication with the distributing chamber, a mixing chamber extending from the housing and having its inlet end in communication with the atmosphere and its outlet end in communication with the distributing chamber, the said parts operating as described.

8. A hydrocarbon burner comprising a horizontal shallow housing having a top and a bottom portion, the top provided with main burner openings, a division plate extending horizontally across the housing located in a plane between its bottom and its main burner to form a burner chamber above said division plate and a distributing chamber in the housing below the said division plate and the said bottom, said division plate constructed to allow a limited communication between the distributing chamber and the said main burner chamber, an auxiliary burner having communication with the distributing chamber, and a generator passing through the said housing and adapted to supply a gaseous mixture to the said distributing chamber and from the distributing chamber to the said burners.

9. A hydrocarbon burner comprising a horizontal shallow housing having a top and a bottom portion, the top formed into a main burner, a horizontally extending baffle plate within the housing located between its top and bottom forming the upper part of the housing into a burner chamber and the lower portion of the housing into a distributing chamber, an auxiliary burner having communication with the said distributing chamber, a mixing chamber extending horizontally from the said housing and a generator passing through the said housing and adapted to supply a gaseous mixture to the mixing chamber and thence to the distributing chamber.

10. A hydrocarbon burner comprising a housing, an inverted U-shaped passageway

extending through the said housing forming a U-shaped generator passageway, said housing having its upper portion provided with burner openings, a generator located in said passageway, a torch supporting member located under the said passageway and the said generator, and a torch adapted to be placed on the supporting member for initially heating the said generator.

11. A hydrocarbon burner comprising a circular housing having an upper and a lower chamber formed therein and communicating with each other, a generator passageway extending across the distributing chamber, a mixing chamber extending outward from said housing with its inner end in communication with the atmosphere and said passageway, a generator located in said passageway and adapted to feed a gaseous mixture to the mixing chamber and said mixing chamber feeding said mixture to the distributing chamber.

12. A hydrocarbon burner comprising a housing divided into an upper main burner and a lower distributing chamber, a generator embraced within said distributing chamber, a mixing chamber comprising a central passageway in communication with the generator and with the atmosphere, said mixing chamber having at each side of the central passageway two passageways having their inner ends communicating with the said distributing chamber and an auxiliary burner having communication with the said distributing chamber.

13. A hydrocarbon burner comprising a housing divided into an upper main burner chamber and a lower distributing chamber, a mixing chamber projecting in a horizontal plane from the housing and comprising three parallel passageways, the central passageway having communication with the atmosphere, a generator embraced within the distributing chamber and in substantially the same horizontal plane, said generator being in communication with the central passageway of the mixing chamber, said side passageways of the mixing chamber having communication with the distributing chamber.

14. A hydrocarbon burner comprising a horizontal shallow housing having projecting from one side thereof a horizontal mixing chamber in the same horizontal plane as the housing, the said housing having its interior divided into an upper main burner chamber and a lower distributing chamber having limited communication with each other, the said housing having a generator passing through the said distributing chamber and communicating with the said horizontally extending mixing chamber, and another burner having communication with the said distributing chamber, whereby both of said burners are supplied from the said distributing chamber substantially as specified.

15. A hydrocarbon burner comprising a shallow housing having a main burner, an inverted U-shaped horizontal generator passageway therethrough, a generator in said passageway, an opening communicating with the passageway at its lower end and its upper end in communication with a main burner above, said inverted U-shaped passageway having sub-fire burner openings.

16. A hydrocarbon burner comprising a housing having a main burner, a generator passing horizontally through the said housing, a mixing chamber having communication at one end with the generator and its other end with said housing, said housing having an opening through it, and an initial heating torch supported below the said opening, whereby the flame from said torch lights the burner.

17. A hydrocarbon burner comprising a housing having a horizontal generator passageway through the said housing, a main burner, a generator in the passageway, the housing above the said passageway having an opening, and a torch supported below the said housing whereby the flame from the torch ignites the burner above.

18. A hydrocarbon burner comprising a housing having an inverted U-shaped horizontal generator passageway therethrough, a main burner, a generator in the said passageway, the upper part of the housing having an opening communicating at its lower end with the said U-shaped passageway and its upper end with the burner slits above, said U-shaped wall having sub-fire burner slits, and a torch supported below the U-shaped passageway whereby the flame from the torch passes through the passageway and the opening.

In testimony whereof I hereunto affix my signature.

LOUIS STOCKSTROM.