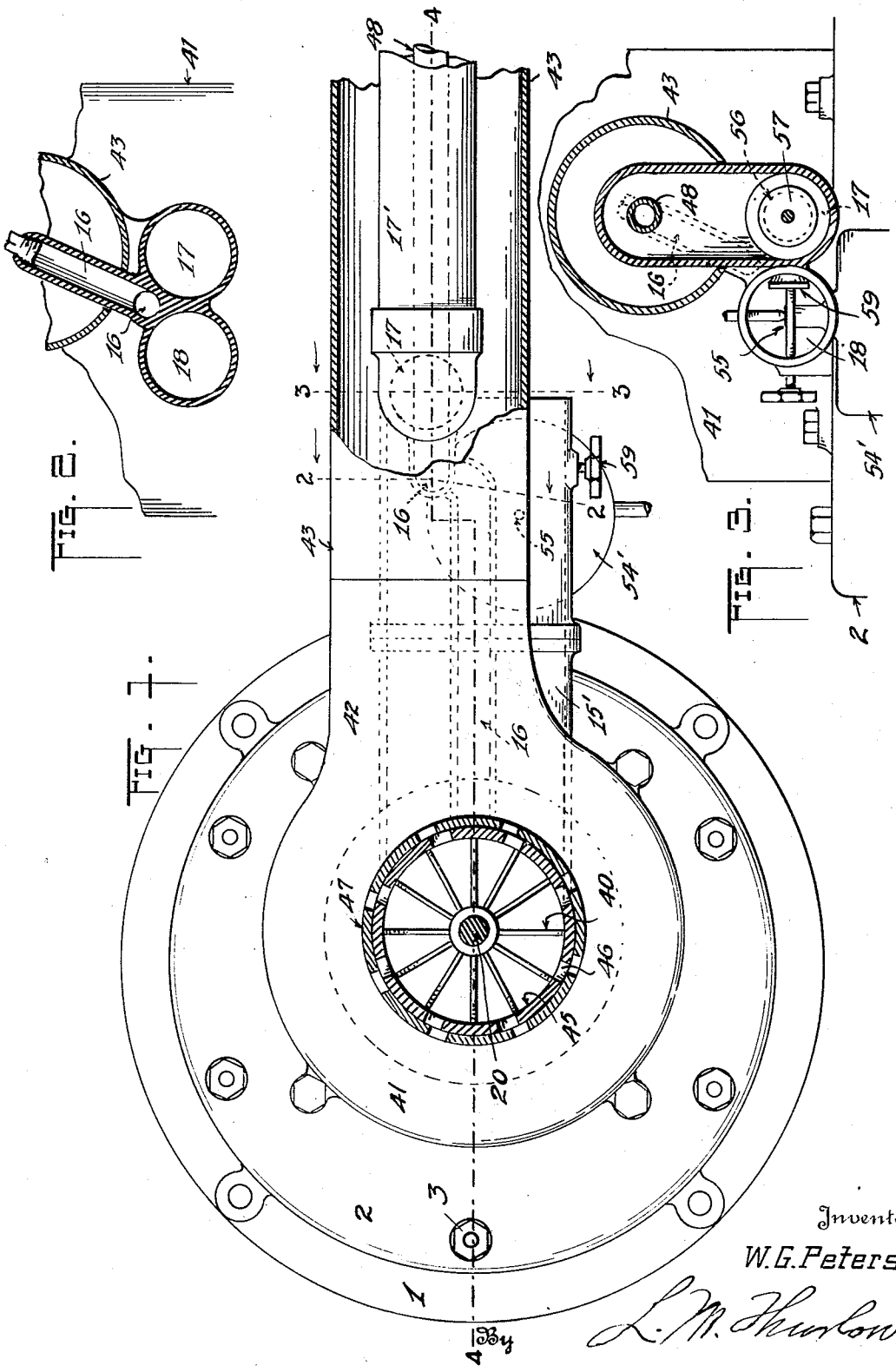
May 27, 1930. W. G. PETERS 1,760,774

FUEL OIL BURNER

Filed March 2, 1926 4 Sheets-Sheet 1

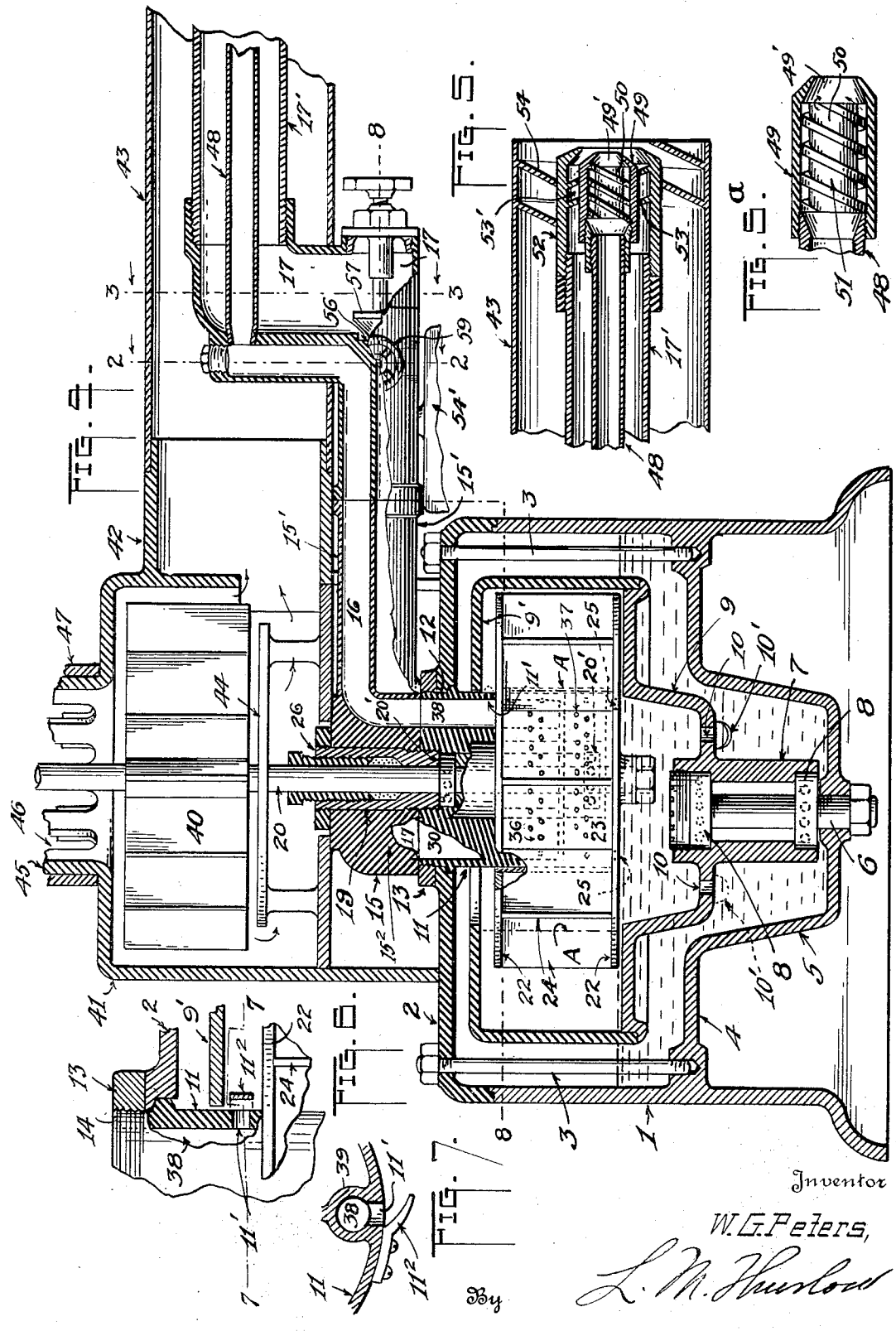



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FUEL OIL BURNER

Filed March 2, 1926 4 Sheets-Sheet 2



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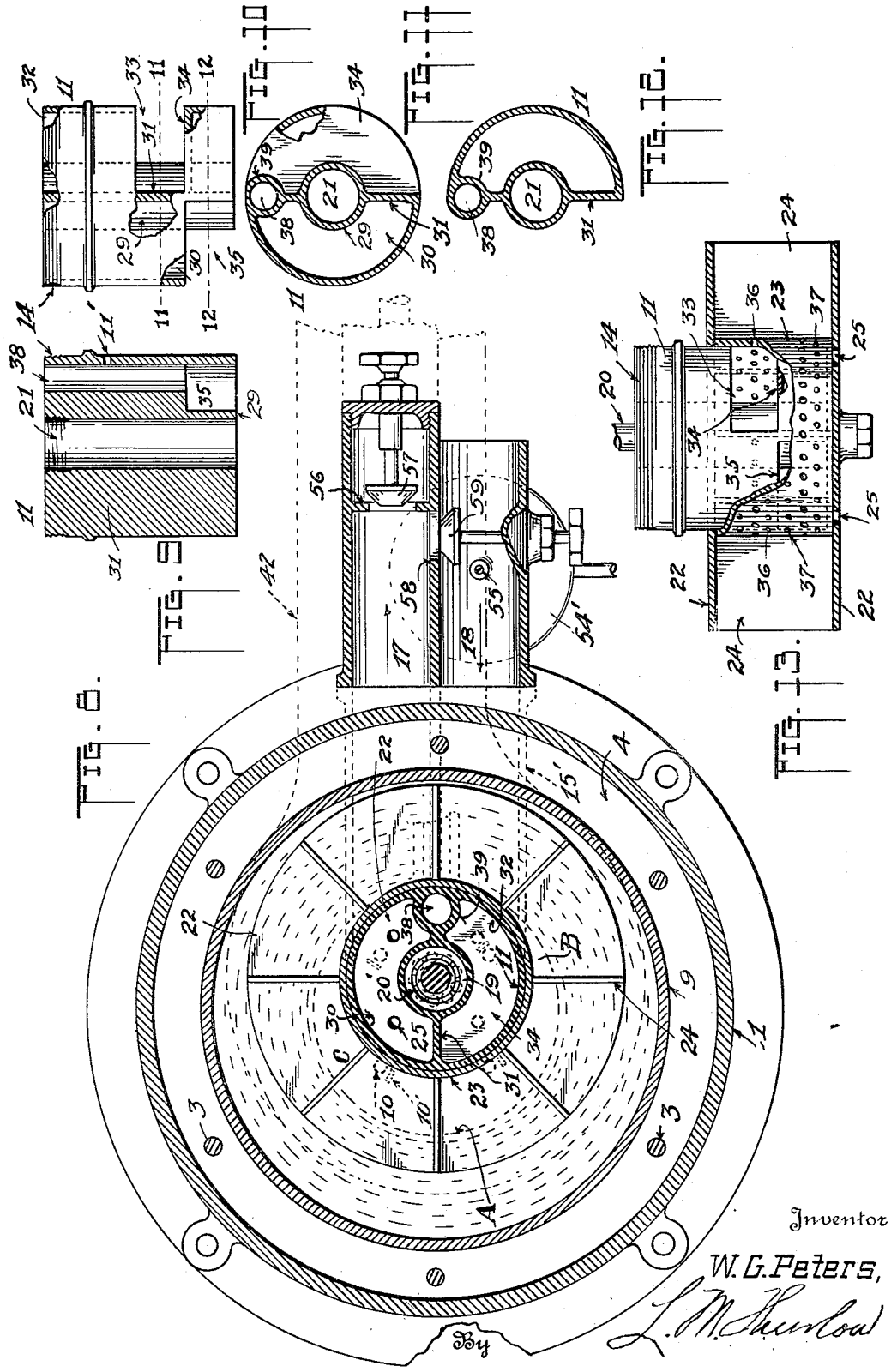
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FUEL OIL BURNER

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FUEL OIL BURNER

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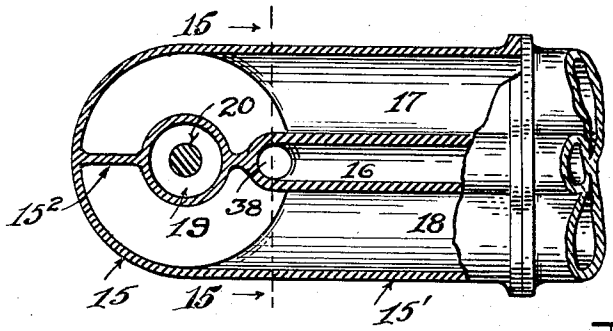



FIG. 14.

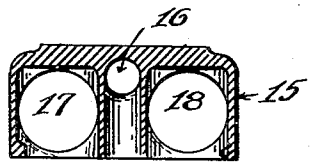



FIG. 15.

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# UNITED STATES PATENT OFFICE

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## FUEL-OIL BURNER

Application filed March 2, 1926. Serial No. 91,803.

This invention pertains to fuel oil burners of that type applicable to heating and power plants.

One of the objects of my invention is to in general, provide a fuel oil burning apparatus of a simple yet very effective type by means of which the greatest amount of heat may be realized from a given quantity of fuel consumed.

Other objects are to construct a burner in which the air and fuel are properly mixed and atomized within the apparatus before reaching the burner whereby an intensely blue flame can be produced and maintained; to atomize the fuel within the apparatus before it is fed to the fuel nozzle or burner and enters the combustion chamber in the heating apparatus; to provide a new structure within the apparatus for the intake of the fuel and the treatment thereof to produce a more thorough atomization than by the other types of apparatus of which I am aware; to furnish a fuel nozzle of a novel type to cooperate with the structure last mentioned by which more complete combustion of the fuel may be obtained for the production of a more intense blue blaze; to employ a peculiar arrangement for breaking up the oil and holding it in suspension in the air on its way to the nozzle or burner; to employ means for regulated air pressure within the apparatus, and to so construct such apparatus internally that there will be few wearing parts.

Other advantages arising from the structure will appear herein as the description proceeds aided by the accompanying drawing wherein,

Figure 1 is a plan of a portion of my apparatus showing parts in section.

Figure 2 is a transverse section of part of the apparatus on line 2—2, Figures 1 and 4.

Figure 3 is a section on line 3—3, Figure 1.

Figure 4 is a vertical section of the apparatus of line 4—4, Figure 1.

Figure 5 is a longitudinal section of the fuel nozzle or burner and associated parts.

Figure 5ª is a similar section, somewhat enlarged, of part of the nozzle or burner shown in Figure 5.

Figure 6 is an enlarged section of parts shown in Figure 4.

Figure 7 is a horizontal section of part of what is shown in Figure 6 taken on line 7—7 of that figure.

Figure 8 is a horizontal section of my apparatus on line 8—8, Figure 4.

Figures 9 and 10 are respectively a vertical section and side elevation of a valve.

Figures 11 and 12 are horizontal sections of the valve shown in Figure 10, taken on line 11—11 and 12—12 respectively.

Figure 13 is an elevation on a valve shown in Figure 10, together with a vertical section of a fan which rotates about it.

Figure 14 is a plan of a portion of the invention with parts shown in section.

Figure 15 is a vertical transverse section of the parts shown in Figure 14 on line 15—15.

My apparatus employs an imprisoned body of oil within which a bladed member rotates by reason of which air is inducted, partially compressed and forced to a nozzle carrying with it particles of fuel in finely divided form. By thus handling the fuel I am enabled to place it in better condition for producing more complete combustion, in addition to which I employ at the said nozzle certain new arrangements of parts all of which, however, will be better understood form the following specifications aided by the described figures of the drawing which show a preferred form of the apparatus, the structure, of course, being subject to changes of minor nature.

The numeral 1 designates a hollow container which in the present instance is a casting which may be stationed adjacent the heating plant, not shown, and having an open upper end on which a cover plate 2, is held by means of stud bolts, 3, for example, secured in said container in any desired manner.

The container includes a portion 4, constituting a bottom, which in this case has a depending part 5 forming a well to receive a liquid, preferably oil. Erected in said well centrally thereof is a fixed stub-shaft 6, upon and about which is rotatable a cylindrically

formed portion 7 supported thereon by suitable anti-friction bearings 8, said portion 7 being part of a receptacle 9 housed in the container 1 and rotatable on the said shaft 6 substantially in the manner described, part of the bottom of said receptacle depending into the well 5 and being furnished with holes 10, there being a deflector 10′ at each of the holes depending into the well for a purpose to appear later.

Depending into the receptacle 9 is a valve as I shall term it denoted in general by the character 11, Figures 9 to 13 inclusive, which is suspended from the cover plate 2 of the body 1. That is to say, the said cover plate has a circular opening 12 which is eccentric to the periphery of the container 1, and that of the said receptacle 9, the valve 11 being inserted therein and held by a lock nut 13, for example, resting on said cover plate, and engaging threads 14 on said valve.

Mounted above the cover plate 2 and resting upon the lock nut 13, for example, is a hollow head 15, Figures 4, 14 and 15, having a lateral extension 15′ within which are passages 16, 17 and 18, Figures 14 and 15, later to be described more fully. The head 15 has a central bore 19 closed to the described passages, a power shaft 20 extending therethrough and through a bore 21, Figure 9, of said valve 11, said shaft terminating within the receptacle 9 and having secured to its lower end a bladed body which may be termed a rotor including an upper and a lower wall 22 and a central sleeve portion 23.

The valve 11 is fixed in position by the described lock nut 13, while the said bladed body driven by said shaft turns about it, said shaft having suitable anti-friction bearings 20′ within the said bore 21 of said valve, a detailed description of such bearings not being believed necessary.

The sleeve portion 23 of the bladed body or rotor, Figure 13, has a smooth turning fit upon the outer periphery of the valve 11, the body carrying within it a series of radial blades 24, abutting the sleeve and the said walls 22 in air tight manner thereby creating a series of pockets or recesses within said body, there being a series of holes 25 in the lower of the walls 22 within the cavity of said sleeve 23 for a purpose to appear. Preferably a stuffing box 26 is provided at the shaft 20 within the bore of the head 15.

It is noted that due to its mounting the bladed body lies eccentric to the receptacle 9 so that therefore its periphery lies in close proximity to part of the wall of such receptacle, for a purpose to appear later. The body of the valve is of a hollow, cylindrical form whose wall is spaced from a central portion 29 within which is the described bore 21 for the shaft 20, there being a passage 30 extending entirely through said body from top to bottom separated from an opposite half of the body by a central wall 31, said opposite half which is also open, forming a passage 32 terminating below at a recess 33 formed in the side of the valve-wall by cutting away a half section of said wall, the portion remaining below such recess being closed or capped over by a wall 34, and one half of the opposite side of the body at its extreme lower end below the passage 30 is cut away or recessed at 35. Besides the passages 30 and 32 of the valve 11 there is a further passage 38 created in an enlargement 39 of the central wall 31, which terminates below the wall 34.

The sleeve portion 23 of bladed body has a series of apertures therein communicating with the cavaties or recesses between the several blades 24, an upper series 36 thereof adapted to communicate with the recess 33 only of the valve, while the lower series 37 can communicate only with the recess 35.

The top 9′ of the receptacle 9 is spaced above the upper side of the bladed body while in the wall of the valve in the space between these parts is an aperture 11′, Figure 6, opening into the passage 38 of said valve and adjacent the aperture at the outer surface of the valve is a deflector plate $11^2$, Figure 7, for directing fuel-oil through said aperture as will be understood in the description of the operation to follow. This passage 38, as shown in Figures 4 and 14, communicates with the passage 16 in the lateral extension 15′ of the head 15 already referred to.

Opening into the said passage 30 is the also described passage 17, of the lateral extension 15′, while into passage 32 the passage 18 opens, as will be understood from Figures 14 and 15, the described head 15 and its lateral extension 15′ being preferably a single casting, and including a wall $15^2$ abutting the central wall 31 of the valve 11, dividing said head into two cavities into which said passages 30 and 17, and passages 32 and 18 separately open. The dotted lines in Figure 8 show clearly the extension of the said passages 17 and 18 leading to the said passages 30 and 32.

Secured to the shaft 20 above the head 15 is a fan 40, and 41 is a housing therefor resting upon the cover plate 2 of the body 1, for example, the cavity of said housing opening into a lateral hollow extension 42, which may have a separate detachable conduit 43 extending therefrom. A deflector plate 44 lies in the cavity of the housing below the fan 40 for the purpose of better deflecting air from the fan through said conduit 43. The housing above the fan has a tubular extension 45 provided with openings or windows 46 controlled by a valve 47 in the form of a sleeve rotatable upon said extension and having similar windows, by which air may be admitted to the said fan 40 and regulated in amount.

As shown in Figure 4, the conduit 16 is extended substantially at right angles some distance from the head 15 being carried to about the center of the conduit 43. The wall in which it is formed has a tube 48 secured therein, which parallels the said conduit 43, and whose bore is a continuation of the passage 16, this addition of the conduit 43 being a preferred arrangement. At the end of the said tube 48 is a tube 49, Figures 5 and 5a, having a constricted opening 49′ for the discharge of atomized fuel-oil. Within the tube 49 is a core 50 having a spiral groove 51 therein adjacent the said tube 49 through which air and fuel is forced and thus made to take up a whirling motion at the said opening 49′ of the tube, it being observed that the extremity of the latter member is coned on its outer surface. That part of the casting for the passage 17 outward from the head 15 is also turned at right angles carrying the said passage 17 to the center of the said conduit 43 where it is extended parallel with and centrally of the latter and receives a pipe 17′ creating an extension of said passage 17 and which encloses the tube 48. Terminating said pipe 17′ is a tube 52 as shown, there being a spirally formed portion 53 in the same forming a spiral groove 53′ between the said tube and tube 49 and so directed as to create a whirling air movement exactly the reverse of that produced in the tube 49.

Finally, the conduit 43 is extended to enclose the tube 52, being substantially coextensive in length therewith. Internally it has a spirally arranged portion 54 interposed between its walls and the tube 52, said portions in turn being the reverse of those in the latter to again provide air currents the reverse of those issuing from said tube 52.

Beneath the passage 18 is a carburetor 54′ which opens at 55 into the said passage for supplying fuel thereto.

In the passage 17 is a valve seat 56, Figures 4 and 8, controlled by a valve 57 and in the wall separating the passages 17 and 18 is a valve seat 58 to receive a valve at 59.

*Operation*.

The body 1 is supplied with a quantity of oil, which seeks its level by flowing up into the receptacle 9 through the holes 10 in the bottom thereof, the high level of the oil when at rest being substantially as shown in Figure 4. Power applied to the shaft 30 clockwise rotates the bladed body 23, together with the fan 40, no further load being carried by the driving motor initially, so that practically full speed can be attained before a further load is placed upon said motor which is of advantage especially when using an electric motor as will be understood.

The said bladed body is at the start but slightly immersed in the oil in the said receptacle 9 and while attaining speed said body in its whirl will transfer a whirling motion to the oil throwing that fluid toward the outer walls of said receptacle 9. The friction of the oil on the receptacle 9 in its whirling motion soon picks up and starts said receptacle 9 into rotation since it is free to revolve on the shaft 6 which supports it and having been placed in rotation as it gradually attains a high speed the oil therein will build up against the outer walls thereof, due to centrifugal action and which, for the purpose of description, may be said to form a vertical wall indicated by the dotted lines at A in Figures 4 and 8 and said wall is, of course, concentric with the wall of the receptacle 9, a pocket being created at the center thereof. To supply an amount of oil sufficient to build up a bulk thereof as seen in Figure 8 above the bladed body, the openings 10 in the receptacle 9 are provided, the deflectors 10′ on the bottom of the receptacle in the rotation of the latter, causing the oil to be scooped from the well 5, and forced or directed into said receptacle.

Since the center of rotation of the bladed body is offset from the center of rotation of the receptacle, a volume of oil sufficient only to immerse the blades 24 is required to be supplied from the well 5 by the deflectors 10′.

The perimeter of the sleeve-portion 23 of the bladed body, as shown at the right of Figure 8, lies substantially at the wall of the oil with the blades 24 at that side totally immersed in said oil. Now as each blade passes out of the oil in said clockwise rotation, a pocket or cavity B is exposed between any two of the blades 24 at said sleeve 23 within which a vacuum tends to form, each cavity ever increasing in size in the travel of the blades and creating therefore a suction into it from the passage 18 past the usual nozzle of the carburetor 54′ through the head 15, the passage 32 and the recess 33 of the valve 11, thence through the apertures or perforations 36 in the sleeve 23, the cavity or cavities B, in this instance being three in number. The blades 24 upon reaching the extreme left and only partially submerged, Figure 8, now begin to reenter the oil body so that the cavities now denoted by C gradually become smaller and compress the air therein which is forced out through the openings or apertures 37 of sleeve 23, thence into recess 35 and passages 30 and 38 of the valve 11, and finally into the passages 16 and 17 to the burner or nozzle tubes 49 and 52 respectively. It is clear that the cavities C are free to discharge all of the air therein as described through the apertures 37, whereupon the blades between which the cavities were formed upon passing through and out of the oil, induct more air in the manner first explained by creating further cavities B.

The apertures or perforation 36, 37 extend entirely around the sleeve 23, but since the lower half-portion of the valve 11 below the recess 33 and wall 34 is separated from the opposite side having the cavity or recess 35 and passage 30, Figure 10, all inducted air for the cavities B must enter through the said recess 33 and the apertures 36 exposed thereto and the air is retained in said cavities B by the cylindrically curved wall below the wall 34 until said cavities pass around to the recess 35 where, due to the decreasing sizes of the cavities C and resultant compression the air is forced thereinto toward as well as into the passage 30, and the passage 38 which communicates with the cavity 35 finally moving to the passages 16 and 17 already described.

Although the air being expelled from the bladed body through the valve 11 and the passages 16 and 17 may be substantially balanced in both it is the desire and aim that it shall have greater velocity through the passage 16 to the burner or nozzle than it has through the passage 17 to the tube 52. That this may be accomplished the valve 57 in said passage 17 is provided for controlling the opening of the valve seat 56. That is to say, by controlling the valve seat opening the pressure through both passages 16 and 17 may be adjusted to an exact degree, relatively, i. e., the more said opening is constricted the greater will be the velocity of air through the passage 16 with a correspondingly reduced flow through said passage 17.

The supply of air to the atomizing device 11, 23 is through the open passage 18, and the inrush of air through the latter over the carburetor outlet or nozzle at 55 draws fuel therefrom which is more or less broken up and held in suspension in the air due to the rapid movement thereof and then forcibly drawn through the apertures 36 in the sleeve 23 of the bladed member being as forcibly expelled through the openings 37 thereof, it is "torn up" and formed into a foam by air blowing into it and then atomized to a great extent before reaching the burner or nozzle and is therefore in excellent condition for rapid and complete combustion at said nozzle.

The openings or apertures 36 and 37 of said sleeve 23 may be made very small, preferably, in order to accomplish the desired breaking up of the oil and greater atomizing thereof, and also may be of a very considerable number so as to freely admit and release the volumes of air handled.

Due to the spiral passage or groove 51 within the said tube 49, the atomized fuel is ejected in a whirl at the constricted opening of such tube 49 and, similarly, the current of air forced through the passage 17 is ejected in a whirl but in an exactly opposite direction from the constricted mouth of the tube 52 where it strikes the atomized fuel, and it will be seen that the coned ends of the tubes 49 and 52 concentrate the blasts at a common position. In addition to feeding air through the passage 17 at the combustion point, a further and additional flow of air from the fan 40 issues from the passage of the conduit 43 through the spiral passage created by the spiral portion 53 but reversed from that of the tube 52, such air being furnished by the fan 40 controlled in volume by the sleeve damper 47 on the housing-extension 45 described.

The pressure of the fuel mixture issuing from the tube 49 is preferably in excess of the fuel mixture discharged from the tube 52 while the air from conduit 43 moves at a still lower rate, but the rapidity of air movements are under perfect control and may be governed according to the results obtained as to the condition of the flame, and it is clear that the manner of reversing the several whirling actions must result in the thorough mixture of air and fuel. Preferably the outer coned end of the tube 49 and the inner coned surface of the tube 52 are employed so that the fuel mixture issuing from the said tube 52 will be carried directly upon and into the flame and assist in the combustion of the fuel.

The previously stated advantage in my apparatus of a better atomizing or breaking up of the fuel by the means described prior to reaching the burner, as distinguished from the usual methods used in an apparatus of this class is important. Not all of the atomized fuel will pass through the passage 16, since some of it will enter from the passage 17 again assisting combustion. As a matter of fact in actual practice the much desired intensely blue flame is produced by my method and this may be aided by the air issuing at and around the burner through conduit 43, which additional air feed in a burner is believed to be novel.

The valve 59 controlling the opening in the valve seat 58 in the wall separating the passages 17 and 18, Figure 8, may be adjusted together with the valve 57 so that the air and part of such atomized fuel that enters the said passage 17 may be diverted and permitted to circulate through the apparatus by way of the carburetor passage 18 for additional or further breaking up, finally issuing through both the passages 16 and 17.

During the whirling movement of the bulk of oil in the receptacle 9 portions thereof are carried into and through the described aperture 11′ in the wall of the valve 11 by the deflector plate $11^2$, Figures 6 and 7, which is added to the atomized fuel issuing through the conduit 16, the amount of oil thus withdrawn from the apparatus being replaced from time to time. Also in the rotation of the

receptacle 9 the bottom thereof is cleared of oil since all of such oil has been thrown outwardly by the described centrifugal action exposing the holes 25 in the bottom of the bladed body. As this occurs the air pressures in the container 1 are permitted to equalize through said holes.

The centrifugal action of the oil in the receptacle 9 is such, of course, that the blades 24 pass into and out of the oil-body practically without disturbing the annular form assumed by such oil-body. Also the vacuum being formed in each of the cavities B is so readily filled by the air from the carburetor passage 18 that there can be but little tendency of the oil to fill such vacuum, in addition to the fact that centrifugal action on the oil prevents such an occurrence.

The use of a bladed member working in a liquid as the means of inducting air and fuel and forcibly ejecting it provides a structure of but few wearing parts as compared with the well known types of rotary pump that might be used for the same purpose which require snug working parts subject to wear. The only wearing surfaces in my structure are those between the valve 11 and the sleeve portion 23.

Again, in such means as I employ, the air pressure is positive toward the burner since it is forced toward and through the same rather than "blown" through as in many of the fan methods in devices of this class, making for far better results.

I claim:

1. Apparatus of the character named including a container for oil, a receptacle therein, supporting means central of the receptacle on which it is free to rotate, said receptacle arranged for free entrance of oil thereto from said container, a hollow cylindrical valve depending into the receptacle in fixed position disposed eccentrically to the walls of the same and having two passages separate from each other, a carburetor connected by a passage with one of the valve passages, a fuel nozzle connected by a passage with the other of the valve passages, a cylindrical sleeve rotatable upon the valve in a snug turning fit, said sleeve having two series of perforations, each series lying in position to communicate with one of the passages having the fuel nozzle and carburetor, a pair of spaced walls paralleling the plane of rotation of the sleeve and connected with said sleeve, a series of blades erected between the walls substantially perpendicular to said plane of rotation and abutting upon and radiating from said sleeve, and means to rotate said sleeve and its connected structure.

2. Apparatus of the character named including a receptacle for partial immersion in a body of oil, a mounting on which the receptacle is free to rotate, said receptacle having openings therein for entrance of the oil thereto, a rotor in said receptacle having its axis of rotation set off from that of the latter, the same comprising a pair of spaced walls, a cylindrical sleeve disposed centrally of the walls connecting the two, and a series of blades radiating from the sleeve and connected thereto and to the said walls, said sleeve having two series of perforations therein connecting with the spaces between the blades, means to drive the rotor, a hollow cylindrical valve fixed in position within the receptacle independent thereof including two passages separate from each other arranged to have connection with one of the series of perforations, said valve lying within and snugly fitting the sleeve of the rotor, a carburetor connected by a passage with one of the passages in said valve, and a nozzle connected by a passage with the other passage of the valve.

3. Apparatus of the character named including a receptacle adapted to rotate in a body of oil, having an upper and a lower wall and side walls, a mounting upon which the receptacle is free to rotate, means to cause the oil to enter the receptacle in the rotation of the latter, a rotor in said receptacle, a mounting for the rotor separate from the receptacle and offset from the axis of rotation of the same, said rotor having a pair of spaced walls whose perimeters lie adjacent the side walls of the receptacle and having a sleeve central of the spaced walls opening at its ends through the same, and also having a series of blades radiating from the sleeve between the walls and connected both to the sleeve and said walls forming pockets open at the periphery of the rotor, a hollow cylindrical valve fixed in position within the receptacle but independent thereof and disposed within the sleeve, said sleeve adapted to turn upon the same, said valve including two passages separate from each other and each communicating with a separate opening in the side of the valve at two different positions, there being two series of apertures in the sleeve of the rotor, each series adapted to separately and independently communicate with one of the passages, a carburetor connected by a passage to one of the passages of the valve, and a nozzle connected by a passage to the other passage of said valve.

4. Apparatus of the character named including a rotatable receptacle for oil having bottom, side and top walls arranged during rotation to retain the oil, a central mounting for the receptacle on which it is adapted to rotate, a rotor mounted in the receptacle separate therefrom on a central axis offset from that of the latter, means to drive the rotor, said rotor including a central sleeve and a structure creating a series of radial pockets or recesses disposed around and adjacent said sleeve, the periphery of the rotor being disposed adjacent the side walls of the recep-

tacle, a hollow cylindrical valve within and snugly fitting the sleeve fixed in position independent of both the receptable and rotor, including two passages separate from each other terminating in spaced positions at said sleeve, a series of perforations in said sleeve communicating with the pockets or recesses arranged to communicate with but one of said passages, a separate series of perforations in said sleeve connecting with said pockets or recesses arranged to communicate with the other of said passages only, a carburetor connected by a passage to one of the passages of the valve, and a nozzle connected by a passage with the other of the said passages of the valve.

5. Apparatus of the character described including a rotatable receptacle for oil having a bottom, side, and top wall arranged during rotation to retain oil, a central mounting for the receptacle on which it is adapted to rotate, a rotor mounted in the receptacle separate therefrom on a central axis offset from that of the latter, means to drive the rotor, said rotor including a central sleeve and a structure creating series of radial pockets or recesses disposed around and adjacent said sleeve, the periphery of the rotor being disposed adjacent the side walls of the receptacle, a hollow cylindrical valve within and snugly fitting the sleeve fixed in position independent of both the receptacle and rotor including two separate passages terminating in spaced positions at said sleeve, a series of perforations in said sleeve communicating with the pockets or recesses arranged to communicate with but one of said passages, a separate series of perforations in said sleeve connecting with said pockets or recesses arranged to communicate with the other of said passages only, a carburetor connected by a passage to one of the passages of the valve, a nozzle connected by a passage with the other of the said passages of the valve, there being an aperture in one of the passages of the valve opening into the receptacle for receiving oil therefrom, and means to direct oil thereinto from said receptacle.

6. Apparatus of the character named including a rotatable receptacle for oil having a bottom, side and top wall arranged during rotation to retain oil, a central mounting for the receptacle on which it is adapted to rotate, a rotor mounted in the receptacle separate therefrom on a central axis offset from that of the latter, means to drive the rotor, said rotor including a central sleeve and a structure creating a series of radial pockets or recesses disposed around and adjacent said sleeve, the periphery of the rotor being disposed adjacent the side walls of the receptacle, a hollow cylindrical valve within and snugly fitting the sleeve fixed in position independent of both the receptacle and rotor including two separate passages terminating in spaced positions at said sleeve, a series of perforations in said sleeve communicating with the pockets or recesses arranged to communicate with but one of said passages, a separate series of perforations in said sleeve connecting with said pockets or recesses arranged to communicate with the other of the passages only, a carburetor connected by a passage to one of the passages of the valve, a nozzle connected by a passage with the other of the said passages of the valve, there being an aperture in the passage of the valve with which the nozzle is connected, said aperture opening into the receptacle for receiving oil therefrom, and means to divert the oil into said aperture.

7. Apparatus of the character named including an oil containing receptacle, said receptacle being rotatable causing the oil therein to assume a body of annular form against the side walls thereof, a central mounting for the receptacle, a rotor including a central sleeves and a bladed structure creating a series of radially disposed closed pockets or recesses disposed around the sleeve and open at the periphery of the rotor, the said periphery of the rotor being disposed adjacent the side walls of the receptacle whereby certain of the pockets adjacent the said side walls during rotation are totally filled with the oil, a hollow cylindrical valve within and snugly fitting the sleeve fixed in position with respect to the receptacle and rotor including two separate passages terminating in spaced positions at said sleeve, a series of perforations in said sleeve connected with the pockets or recesses thereof adapted to communicate with one of said passages only, a separate series of perforations in said sleeve also connected with said pockets or recesses adapted for connection with the other of said passages only, a carburetor connected by a passage to one of the passages of the valve, and a nozzle connected by a passage with the other of the said passages of the valve.

8. Apparatus of the character named including an oil containing receptacle, said receptacle being rotatable causing the oil therein to assume a body of annular form against the side walls thereof, a central mounting for the receptacle, a rotor including a central sleeve and a bladed structure creating a series of radially disposed closed pockets or recesses disposed around the sleeve and open at the periphery of the rotor, the said periphery of the rotor being disposed adjacent the side walls of the receptacle whereby certain of the pockets adjacent the said side walls during rotation are totally filled with the oil, a hollow cylindrical valve within and snugly fitting the sleeve fixed in position with respect to the receptacle and rotor, including two separate passages terminating in spaced positions at said sleeve, a series of perforations in said sleeve connected with the pock-

ets or recesses thereof adapted to communicate with one of the passages only, a separate series of perforations in said sleeve also connected with said pockets or recesses adapted for connection with the other of the said passages only, a carburetor connected by a passage to one of the passages of the valve, a nozzle connected by a passage with the other of the said passages of the valve, there being an aperture in the passage of the valve with which the nozzle is connected, said aperture communicating with the interior of the receptacle for receiving oil therefrom, and means to divert oil into said aperture.

9. Apparatus of the character named including a hollow cylindrical valve having two passages separate from each other, a carburetor connected by a passage to one of the said passages of the valve, a nozzle connected by a passage to the other of the passages of the valve, the said passages of the valve being open in separate terminal spaced positions, a rotor including a sleeve adapted to rotate upon the valve in close relation thereto and also including a structure creating pockets or recesses disposed around the sleeve, means to drive the rotor, there being a series of perforations in the sleeve communicating with the pockets or recesses and adapted to communicate with the terminal of one of the passages only of the valve, there being a second series of perforations in the sleeve also communicating with the pockets or recesses and with the other of the valve passages, a receptacle for oil free to rotate in which the rotor is disposed, and supports on which the receptacle and rotor are independently mounted, the axes of rotation of those parts being offset from each other.

10. Apparatus of the character named including a hollow cylindrical valve having two passages separate from one another, a carburetor connected by a passage to one of the said passages of the valve, a nozzle connected by a passage to the other of the passages of the valve, the said passages of the valve being open in separate terminal spaced positions, a rotor including a sleeve adapted to rotate upon the valve in close relation thereto and also including a structure creating pockets or recesses disposed around the sleeve, means to drive the rotor, there being a series of perforations in the sleeve communicating with the pockets or recesses and adapted to communicate with the terminal of one of the passages only of the valve, there being a second series of perforations in the sleeve also communicating with the pockets or recesses and with the other of the valve passages, a receptacle for oil in which the rotor is disposed, supports on which the receptacle and rotor are independently mounted, the axes of rotation of the parts being offset from one another, there being an aperture in that passage of the valve with which the nozzle is connected, said aperture being open to the said receptacle, and means for diverting oil through said aperture from the receptacle.

11. Apparatus of the character named including a receptacle for oil, a central mounting for the same on which it is free to rotate, a rotor in the receptacle, a central mounting for the rotor and means to drive it, said rotor turning in the oil of the receptacle adapted to create suction and pressure, the same being disposed eccentrically to the said receptacle and having a body including spaced walls, a sleeve disposed centrally of the same perpendicularly thereto, and blades radiating from the sleeve lying between the walls forming a series of pockets or recesses, a hollow cylindrical valve enclosed in the sleeve mounted independently of the receptacle and rotor and having fixed position, said valve being provided with two independent passages having separate spaced terminals, a carburetor connected by a passage to one of the passages of the valve, a nozzle connected by a passage to the other passage of the valve, there being two series of apertures in the sleeve of the rotor communicating with the pockets or recesses and open to the terminals of the passages of the valve, the two series of apertures adapted to communicate each with but one of the passages of the valve, portions of the valve adapted to cover part of each series of apertures in the rotation of the rotor whereby said rotor creates suction from the carburetor and to create pressure toward the nozzle.

12. Apparatus of the character named including a member adapted to rotate in oil, and means to rotate it, said member having a series of pockets or recesses wholly sealed by the oil adapted during rotation to alternately wholly fill with the same and then to become partially free therefrom, said member having a central sleeve provided with two series of perforations open to the pockets or recesses, a valve enclosed by the sleeve including two independent passages each terminating at one of the said series of perforations, a nozzle connected by a passage to one of the passages of the valve, and a source of liquid fuel connected by a passage to the other passage of said valve.

13. Apparatus of the character named including a member adapted to rotate in oil, and means to rotate it, said member having a series of pockets or recesses wholly sealed by the oil adapted during rotation to alternately wholly fill with the same and then to become partially free therefrom, said member having a central sleeve provided with two series of perforations open to the pockets or recesses, a valve enclosed by the sleeve including two independent passages each terminating at one of the said series of perforations, a nozzle connected by a passage to one

of the passages of the valve, a source of liquid fuel connected by a passage to the other passage of said valve, there being an aperture in the passage of the valve connected to the nozzle outside the member, and means to divert oil into said aperture.

14. Apparatus of the character named including driven means for the induction into it of a liquid fuel and air and for the discharge of the same therefrom, a source of liquid fuel, a conduit connecting the said source with the intake of said means, a nozzle, a conduit connecting the nozzle with the discharge outlet of the said means, a third conduit enclosing the nozzle, conduit, spaced therefrom, and itself leading to the nozzle, there being a passage connecting the fuel inducting conduit with the said third conduit, means in manual control of the passage, a conduit enclosing and spaced from the said third conduit and leading to the nozzle, and means for creating air movement through said conduit to said nozzle.

15. An apparatus of the character described including a container for oil, a receptacle mounted therein free to rotate on a vertical axis and free to receive oil from the container, a fixed cylindrical hollow valve vertically disposed within the receptacle having a position offset from the axis of rotation of the latter, a vertical wall separating the space in the valve into two compartments, there being an opening in the outer wall of the valve at each compartment and opening thereinto at two different heigts thereon, there being a passage in the valve in communication with one of the said compartments, a nozzle connected with the passage, a perforate sleeve enclosing the valve and having a snug turning fit thereon, its perforations adapted to communicate with the openings of the valve, said sleeve including vertical blades disposed radially therearound forming pockets, the latter being closed at top and bottom and open toward the walls of the receptacle, and means to rotate the sleeve and its blades.

16. An apparatus of the character described including a container for oil, a receptacle mounted therein free to turn on a vertical axis and arranged to permit oil to flow into it from the container, a fixed cylindrical hollow valve vertically disposed within the receptacle having a position offset from the axis of rotation of the latter, a vertical wall separating the space of the valve into two compartments, there being an opening in the outer wall of the valve into each said compartment and each at a different height, there being a passage communicating with one of the compartments leading outside the apparatus, a nozzle connected with the passage, there being an aperture in the wall of the passage opening into the said receptacle for receiving oil from the latter, a perforate sleeve enclosing the valve spaced from the aperture and having a snug turning fit thereon, its perforations adapted to communicate with the openings of the valve, said sleeve including vertical blades disposed radially therearound forming pockets closed at top and bottom and open toward the walls of the receptacle.

17. An apparatus of the character described including a container for oil, a receptacle mounted therein free to turn on a vertical axis and arranged to permit oil to flow into it from the container, a fixed cylindrical hollow valve vertically disposed within the receptacle having a position offset from the axis of rotation of the latter, a vertical wall separating the space of the valve into two compartments, there being an opening in the outer wall of the valve leading to each compartment, each at a different height, there being a passage leading to one of the compartments from outside the apparatus, a nozzle connected with the passage, there being an aperture connecting the space in the receptacle with said passage, a deflector fixed with respect to the aperture, a perforate sleeve enclosing the valve in a snug turning fit and spaced from said aperture, its perforations adapted to communicate with the openings of the valve, said sleeve including a structure to form pockets radiating therefrom opening toward the wall of the said receptacle and communicating with the said perforations.

18. An apparatus of the character described including a container for oil, a receptacle mounted therein free to turn on a vertical axis and arranged to permit oil to flow into it from the container, a fixed cylindrical hollow valve vertically disposed within the receptacle having a position offset from the center of rotation of the latter, a wall separating the space of the valve into two compartments, there being an opening in the outer wall of the valve leading separately to each compartment, a nozzle, a conduit connected at one end with one of the compartments and at its other end leading to said nozzle, a carburetor, a conduit leading therefrom and connected into the other compartment of the valve, there being an aperture through which oil in the receptacle may communicate with the conduit leading to the nozzle, a perforate sleeve enclosing the valve spaced from said aperture, its perforations adapted to communicate with the openings of the valve, said sleeve including a structure to form pockets radiating therefrom opening toward the wall of the said receptacle and communicating with said perforations.

19. In an apparatus of the type described including a liquid fuel atomizer, the combination of a container for fuel oil, a receptacle mounted therein adapted for free rotation on a vertical axis and adapted to receive oil

freely from said container, a rotor in said receptacle mounted on a vertical axis offset from the axis of the latter and in its rotation maintaining a body of the oil against the wall of the same, said rotor including a perforate hollow drum-shaped member having a plurality of peripheral pockets communicating with the perforations, a fixed hollow drum-shaped valve within the member having an inlet and an outlet, and a nozzle connected with the said outlet.

20. In an apparatus of the type described including a liquid fuel atomizer, the combination of a container for fuel oil, a receptacle mounted therein for free rotation on a vertical axis and adapted to receive oil freely from said container, a rotor in said receptacle mounted on a vertical axis offset from the axis of the latter and in its rotation maintaining a body of the oil against the wall of the same, said rotor including a perforate hollow drum-shaped member having a plurality of peripheral pockets communicating with the perforations, a fixed hollow drum-shaped valve within the member having a separate inlet and outlet, a nozzle connected with the outlet, and a carburetor connected with the inlet.

21. In an apparatus of the type described including a liquid fuel atomizer, the combination of a container for fuel oil, a receptacle mounted therein for free rotation on a vertical axis and adapted to receive oil freely from said container, a rotor in said receptacle mounted on a vertical axis offset from the axis of the latter and in its rotation maintaining a body of the oil against the wall of the same, said rotor including a perforate hollow drum-shaped member having a plurality of peripheral pockets communicating with the perforations, a fixed hollow drum-shaped valve within the member having an outlet provided with an aperture communicating with the space of the receptacle, a nozzle connected with the outlet, an inlet, and a carburetor connected with the inlet.

22. In combination with a fuel nozzle of an oil burner, a combined fuel and air mixing and pressure inducing device, a conduit connected into the device and also connected with the nozzle and a second conduit also connected into the device and extending to the nozzle encircling the same, both conduits conveying the fuel mixture from said device to the said nozzle.

23. In combination with a fuel nozzle of an oil burner, a combined fuel and air mixing and pressure inducing device, a conduit connected into the device and also connected with the nozzle, a second conduit also connected into the device and extending to the nozzle encircling the same, both conduits conveying the fuel mixture from said device to the nozzle, and a valve in control of the said second conduit for varying the volume of the fuel mixture passing through said conduit toward said nozzle.

24. An apparatus of the character described including a burner, a cylindrical valve having two separate compartments, a conduit connected between the burner and one of the compartments, a container for oil, a receptacle within the container free to rotate, said valve extending into the receptacle, a rotor within the latter with its axis offset from the axis of rotation of said receptacle, its periphery lying in close proximity to the side wall of the latter and having a central cylindrical perforate portion encircling said valve and having close contact therewith, said rotor including separate cavities open toward the receptacle walls but otherwise closed and communicating with the perforations, there being an aperture in the conduit open within the receptacle and outside the said rotor.

25. An apparatus of the character described including a container for oil, a receptacle therein free to rotate on a vertical axis and having an opening to receive oil from the said container, a fixed hollow cylindrical valve vertically disposed within the receptacle with its center offset from the center of rotation of the latter and separated into two compartments each opening outside the same, a nozzle connected with one of the compartments and opening into the receptacle by an aperture in its wall, and a perforate sleeve rotatable upon and about the valve, spaced from the said aperture, and including a series of independent cavities surrounding the same opening toward the vertical walls of the receptacle but otherwise closed except as to said perforations of said sleeve.

In testimony whereof I affix my signature.

WILLIAM G. PETERS.