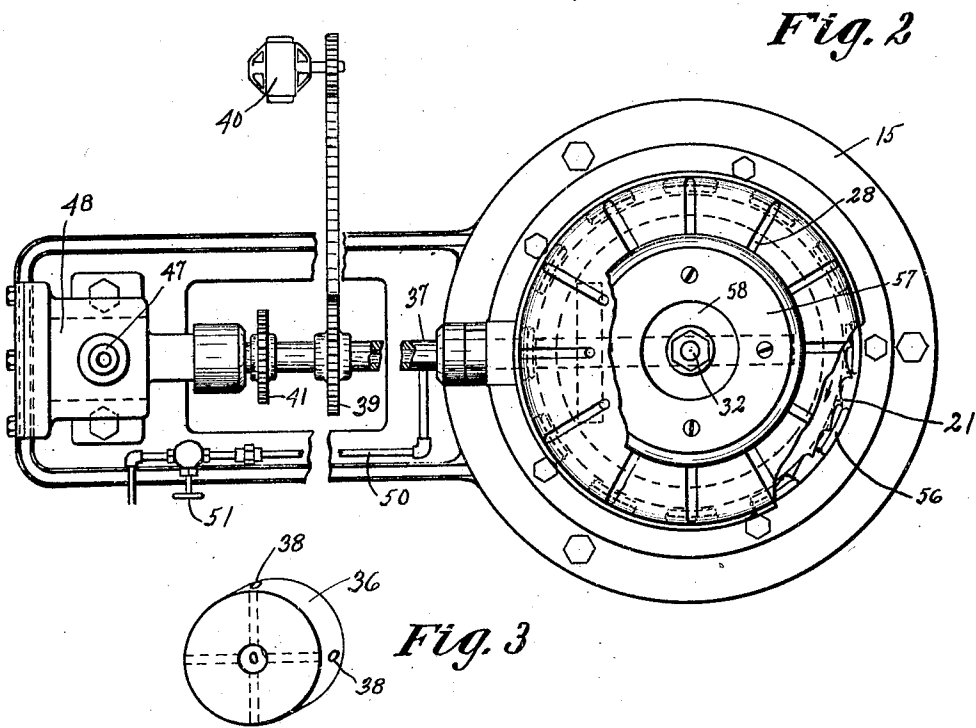
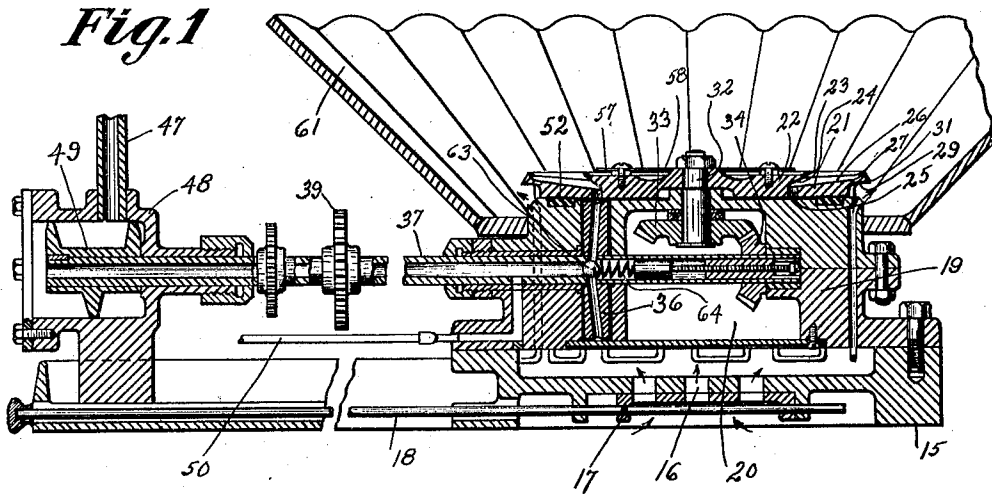


T. J. H. PEIRCE,
OIL BURNER.
APPLICATION FILED JAN. 30, 1920.

1,410,112.

Patented Mar. 21, 1922.
3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 5

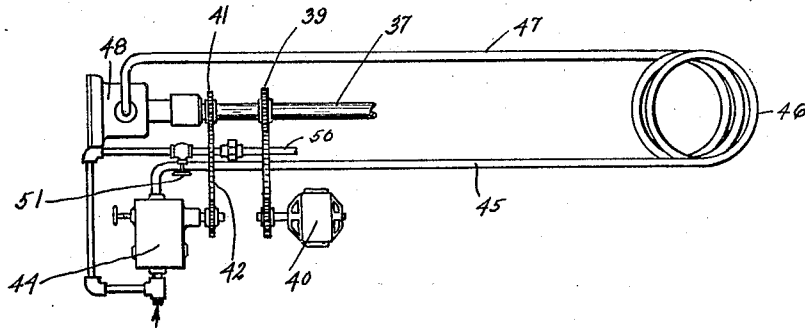


Fig. 6

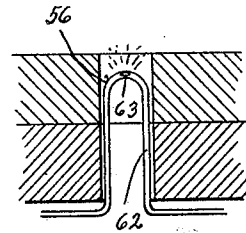
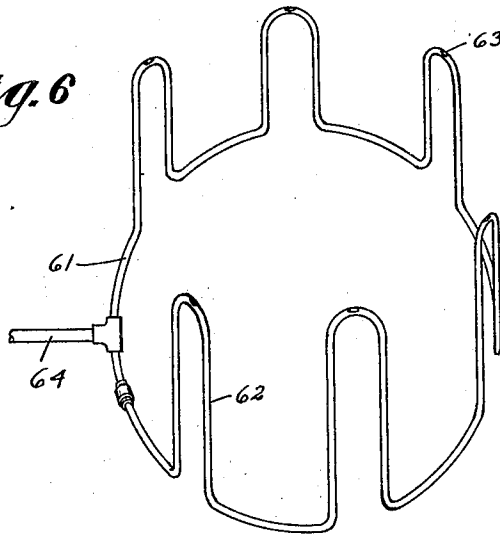


Fig. 7

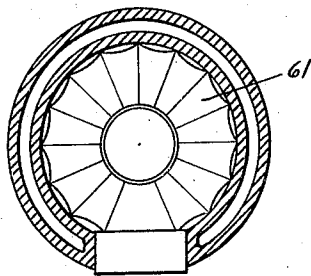


Fig. 8

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3 SHEETS—SHEET 3.

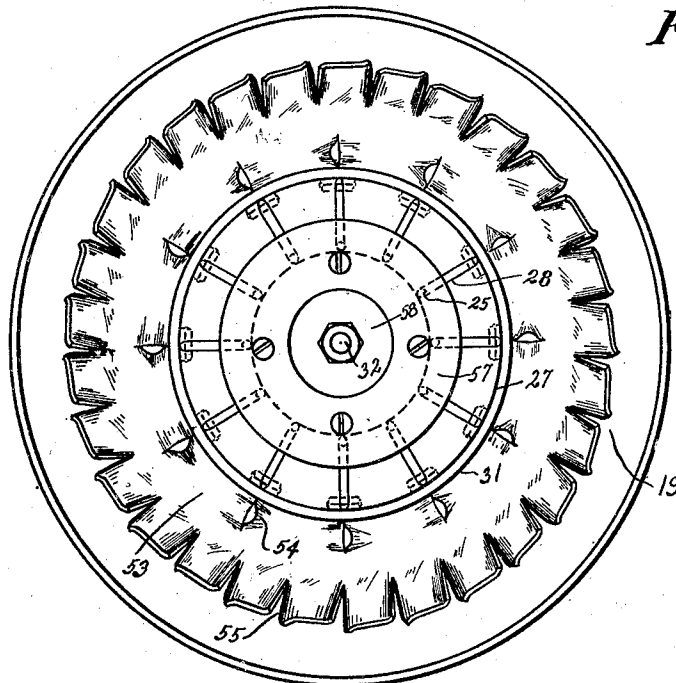


Fig. 9

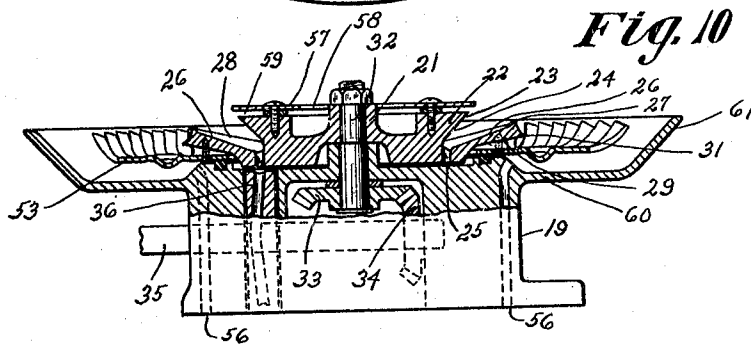


Fig. 10

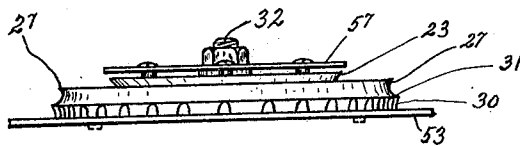


Fig. 11

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UNITED STATES PATENT OFFICE.

THOMAS J. H. PEIRCE, OF CRANSTON, RHODE ISLAND.

OIL BURNER.

1,410,112.

Specification of Letters Patent. Patented Mar. 21, 1922.

Application filed January 30, 1920. Serial No. 355,162.

To all whom it may concern:

Be it known that I, THOMAS J. H. PEIRCE, a citizen of the United States, and resident of Edgewood, city of Cranston, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Oil Burners, of which the following is a specification.

This invention relates to hydrocarbon burning apparatus more particularly adapted for burning the heavier oils; and the object of this invention is to provide an efficient apparatus by which the maximum heat may be generated from the minimum amount of fuel.

A further object of the invention is to provide a centrifugal burner and means whereby the surplus fuel about the burner is entirely confined and not exposed to the possibility of becoming ignited, the oil being supplied only as fast as it is consumed.

A still further object of the invention is to automatically shut off the supply of oil when the burner ceases to operate.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1—is a sectional side elevation illustrating parts of one operative embodiment of my invention.

Figure 2—is a plan view of the parts shown in Figure 1.

Figure 3—is a perspective view showing a detail of the feeder-member.

Figure 4—is a detail illustrating the fuel agitator member.

Figure 5—is a diagrammatic view illustrating the general arrangement of the supply line; also showing the pre-heating coil through which the supply passes

Figure 6—is a perspective view illustrating the general arrangement of loops providing pilot lights for maintaining a proper temperature of the atomizing member while at rest.

Figure 7—is a detail partly in section illustrating one of the pilot-light loops mounted in an air-feeding passageway.

Figure 8—is a plan view illustrating the general form of a heater in section in which is mounted a protector jacket for the walls of the fire pot.

Figure 9—is a plan view showing the centrifugal atomizing member and the air-deflecting plate or member carried thereby.

Figure 10—is a sectional elevation of the parts shown in Figure 9.

Figure 11—is a side elevation of the atomizer member.

With reference to the drawings, 15 designates the base of my improved burner on which the operating parts are supported. In this base I have constructed a plurality of air-inlet passageways 16 which are controlled by a damper 17 moved by a rod 18 whereby the opening through these passageways may be nicely controlled to limit the amount of air that shall be permitted to pass to the burner.

On this base I have mounted the casing 19 which is preferably formed hollow providing a central oil-carrying chamber 20, the contents of which serve a double purpose which is that of lubricating the operating parts and also keeping the casing comparatively cool. On the upper side of this chamber I have mounted a centrifugal atomizing member 21 which may be constructed in any suitable way, the preferred form, however, being illustrated in Figures 9 and 10, in which a distributing disk 22 is provided with a sharp, circular edge 23 having an inclined under surface 24 up which the oil which enters through the openings 25 passes to be thrown from said edge 23.

A second disk 26, larger in diameter than disk 21, is provided with a distributing edge 27 on a plane lower than edge 23 and this disk 26 is provided with radially-disposed channelways 28 in its face leading from the oil feed-holes 25 to the distributing edge 27.

The under side of this disk 26 is also provided with an upwardly-inclined surface 29, which is supplied with oil deposited on the under side of this disk 21 by the feeder-member, presently described.

This lower, inclined surface also terminates in a sharp, oil-distributing edge 31 which is of greater diameter than the distributing edge 27 and is on a plane lower than said edge 27.

The outer periphery of the disk 26 between the edges 27 and 31 is so shaped that the oil will be thrown from edge 27 and will not travel down to edge 31.

By this construction of atomizer it will be noted that the fuel is being distributed

simultaneously from these different levels and from circular edges of these different diameters.

This centrifugal atomizing member is mounted on the upright shaft 32, on the lower end of which shaft is mounted a gear 33 which meshes with gear 84 on the driving shaft 37 from which this shaft and atomizer are rotated at a high velocity.

In order to nicely control the supply of oil to this centrifugal member I have provided a feeder-member 36 preferably in disk form which is mounted on the driving shaft 37 to rotate in a plane at a right angle to that of the atomizing member. In this feeder I have shown a plurality of radial ducts or passageways 38 leading from the center thereof to its periphery this being shown as being supplied through the hollow driving-shaft 37 but which may be supplied thereto by any other suitable means.

This shaft is shown as being provided with a gear 41 which transmits motion through the belt 42 to a pump 44, which pump receives the oil from any suitable source of supply and conducts the same through a tube 45 around through the coil 46 which is preferably placed in proximity to the heated parts whereby the oil is heated previous to its being conducted back through the pipe 47 to the chamber 48 in which the agitator 49 operates. This agitator is for the purpose of working the oil over and over to smooth out hard substances and place the oil in condition to flow more uniformly and freely through the conductors.

From this agitator chamber the oil is conducted through the tubular shaft 37 to the axis of the feeder-member.

It is found in practice owing to varying atmospheric temperatures that the heat required is not always uniform and therefore the supply of fuel must vary and as I have provided means for regulating the supply which in this case is accomplished by the provision of a bypass or return pipe 50 which is connected at one end to the main supply at a point adjacent the feeder-member and leads back to the intake side of the pump. This bypass is provided with a control valve 51 which may be adjusted by hand or by other means (not shown) to control and determine the amount of fuel which shall be conducted to the feeder-member.

It will be noted that the feeder-member is so geared that its surface will run in a direction opposite to the adjacent surface of the atomizing member 26, the openings 25 in this atomizing member being spaced to register with the radiating passageways 38 in the feeder-member at certain intervals so as to pass oil intermittently through holes 25 in the atomizer plate to the upper surface thereof.

The feeder-member is also arranged to dis-

tribute a certain amount of oil on the under surface of the centrifugal plate, which oil due to centrifugal force acting upon it in the radial feeder-passageways, works outwardly and radially on the bottom of the atomizing plates past the flow-restricting and heat-resisting packing ring 52, to be conducted through the passageways 30, see Figure 11, and discharged from the lower edge 31 of the centrifugal atomizer.

In order to shut off the flow to this feeder member automatically, when not needed, I have provided a ball valve 63 adapted to be pressed lightly by spring 64 against the center intake whereby the suction on the oil due to centrifugal force, caused by the rapidly rotating feeder, will cause the valve to open and permit a further supply and as soon as the feeder ceases to rotate, this valve will close and shut off the supply thereby preventing waste and dangerous overflow of oil.

On the lower side of this atomizing member I have secured a plate 53, the face of which is provided with a plurality of scoop-shaped depressions 54 which are adapted to collect the air in rotating rapidly to direct it at an angle upwardly to supply oxygen to the flame.

The outer edge of this plate 53 is slit as at 55 at close intervals, one edge of which is turned downwardly and the other upwardly to provide a fan-shaped member for further drawing the air upwardly through the air passageway 56 in the casing and directing it against the fuel in suspension to turn the same in an upward direction.

It will be noted that the fuel is being atomized and thrown out radially with considerable force from three different planes which effect would be to have a blaze in three separate, horizontal planes, and the function of this fan or blower is to provide sufficient draft to supply oxygen for combustion and also turn the different strata of the flame upwardly causing an intimate intermingling of the atoms in suspension and controlling the angle at which the flame is projected.

As this blaze and the heated gases therefrom are forced outwardly and upwardly, a central, downwardly-directed current of heated gases is naturally created, which downward flow serves to heat the upper ring or plate 57 to incandescence and so further aid the combustion of the oil which is being thrown off from the upper edge 23 as some of these gases after coming in contact with the incandescent plate pass through the center opening 58 of this ring and out through the space 59 therebeneath making its escape with the oil which is thrown from the edge 53.

In order to control in a measure the heat radiation and cause it to be reflected back into the zone of combustion, I have provided a saucer-shaped structure on the casing, the same being provided with a bottom

plate 60, the outer edge portion of which is turned upward on an incline as at 61, which structure in addition to its heat-confining function is also found to be useful in protecting the fan blades see Figure 10 and supporting the fire box protector lining also serving as a means for collecting unburned fuel.

In order to provide means for maintaining the centrifugal atomizing parts at a sufficient temperature for immediate combustion when supplied with oil, also for igniting the oil when supplied, I have provided a series of so-called pilot lights which are preferably located beneath and are arranged to act upon the lower surface of the atomizing parts.

The means for providing these pilot lights may be constructed in any suitable form, but I have herein shown a pipe or tube 61 bent into a plurality of loops 62 to fit into the air passageways 56, each loop being provided with an opening 63 from which the flame burns, which flame is supported by a suitable fuel which may be either gas or oil supplied through the pipe 64 or the same may be heated by my electrical coils (not shown).

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In an oil burner, a centrifugal atomizer, and an independent rotatable feeder-member rotatable in proximity to said atomizer having oil passageways arranged to deliver fuel intermittently thereto.

2. In an oil burner, a centrifugal atomizer, an independent feeder member rotatable in proximity to said atomizer and delivering fuel to the surface thereof.

3. In an oil burner, a centrifugal atomizer and a rotatable feeder-member adapted to deliver the oil intermittently to the under side of said atomizer.

4. In an oil burner, a centrifugal atomizer, and a rotatable feeder-member adapted to deliver the oil intermittently to the under side of said atomizer, and means for rotating said feeder and atomizer.

5. In an oil burner, a centrifugal atomizer, a rotatable feeder-member, an oil well in which said member rotates a portion of said member rotatable in proximity of said atomizer, and means in said member whereby the fuel may be discharged both to said well and to the under side of said atomizer.

6. In an oil burner, a centrifugal atomizer plate provided with a series of oil holes through it, a feeder member having an oil passageway, and means for rotating said plate and feeder in time with each other

whereby said passageway and holes will register intermittently.

7. In an oil burner, a centrifugal atomizing member, a center draft-ring mounted on and spaced apart from the upper surface of said member for assisting the circulation of the returned heated gases, and means for rapidly rotating said member.

8. An oil burner comprising a casing, air passageways in said casing, a centrifugal atomizer having oil-distributing edges carried by said casing member, said edges being located in different planes, means for delivering oil to the under side of said atomizer, a plate attached to said atomizing member, said plate being provided with air-collecting members, and fan blades also carried by said plate for creating a draft of air through said passages for supplying combustion and also for upwardly directing the fuel in suspension.

9. In an oil burner, a centrifugal atomizer member, means for supplying oil to the under side of said member and a wall adjacent the combustion zone for concentrating the radiated heat to assist combustion.

10. In an oil burner, a centrifugal atomizer member, means for supplying oil to the under side of said member, a wall adjacent the combustion zone for concentrating the radiated heat to assist combustion, said wall being set on an incline about the combustion zone for confining the heat and so aiding combustion.

11. In an oil burner, a centrifugal atomizer, an independent rotatable feeder-member below said atomizer and provided with radial fuel passageways, and means for supplying fuel to said feeder-member at its axis.

12. In an oil burner, a centrifugal atomizer, an independent rotatable feeder-member located below said atomizer and provided with radial fuel passageways, and a valve for automatically shutting off the supply when said feeder ceases to rotate.

13. In an oil burner, a centrifugal atomizer, a rotatable feeder member provided with radial fuel passageways, a supply tube for conducting the fuel to the axis of said member, and a bypass in said tube for controlling the pressure of oil to the feeder.

14. An oil burner comprising a casing, a centrifugal atomizer mounted on said casing, a feeder-member arranged to deliver oil intermittently to said atomizer, said casing beneath said atomizer having an oil-tight chamber and power-transmitting mechanism in said chamber for rotating said atomizer and feeder in unison.

15. An oil burner comprising a casing, a horizontally-disposed centrifugal atomizer mounted on said casing, a feeder-member for said atomizer, said casing being located below said atomizer and having an oil-tight

chamber, power-transmitting mechanism in said chamber for rotating said atomizer and feeder in unison, and means whereby said chamber is supplied with oil through said feeder-member.

16. In an oil burner, a centrifugal atomizer and a rotatable feeder-member adapt-

ed to deliver the oil intermittently to the under side of said atomizer, and a conductor for passing the supply oil in proximity to the heated parts prior to admitting it to said heater.

In testimony whereof I affix my signature
THOMAS J. H. PEIRCE