

Aug. 19, 1924.

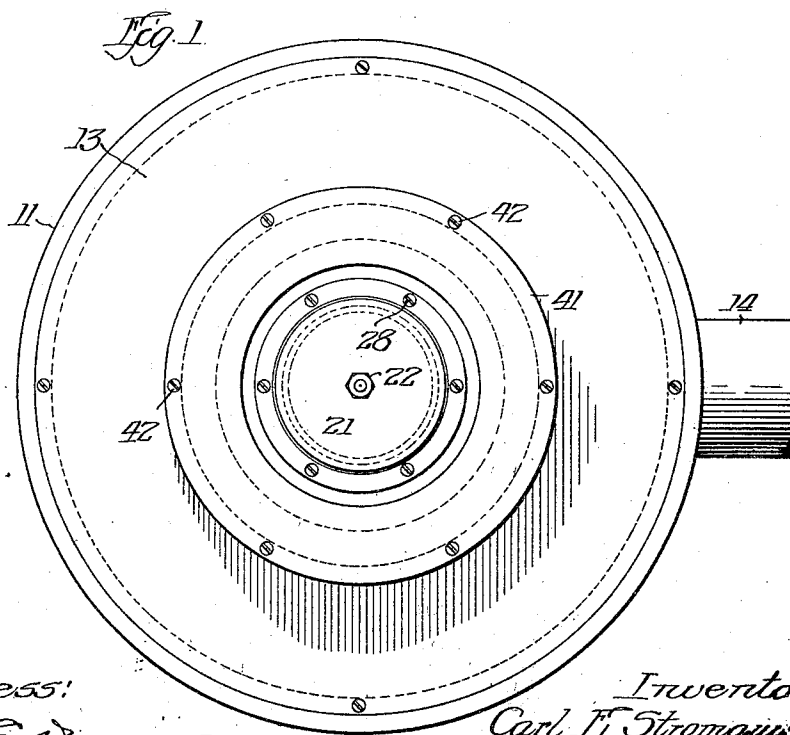
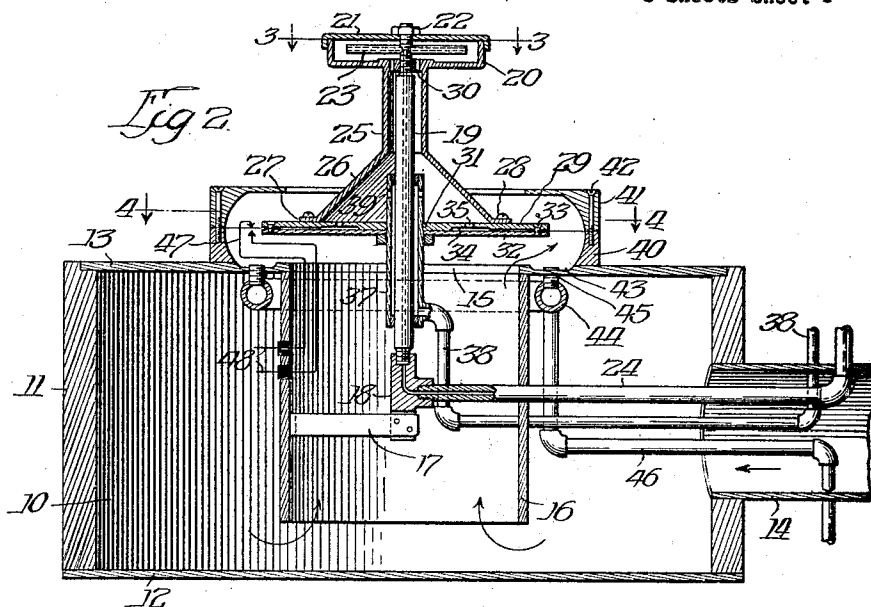
C. E. STROMQUIST

1,505,745

OIL BURNER

Filed March 31, 1922

2 Sheets-Sheet 1



Witness:

Ed. Carlson

Inventor

Carl E. Stromquist

By Casper A. Redfield
Att'y.

Aug. 19, 1924.

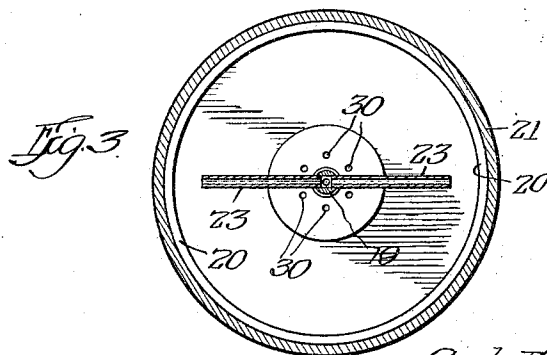
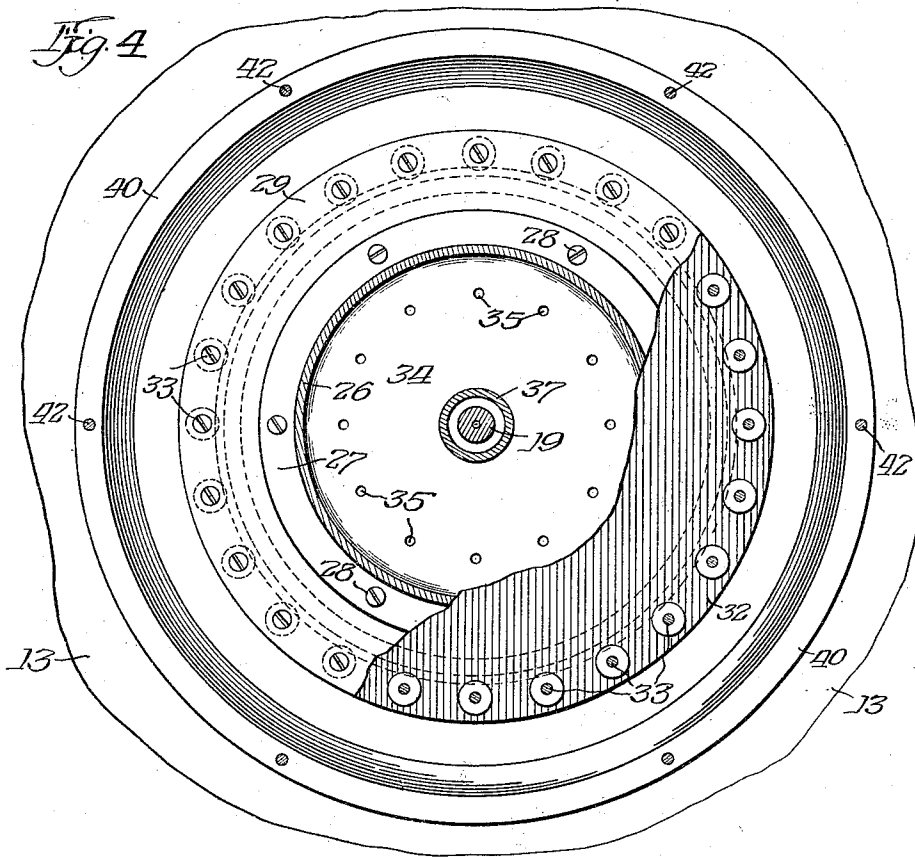
C. E. STROMQUIST

1,505,745

OIL BURNER

Filed March 31, 1922

2 Sheets-Sheet 2



Witness:

Ed. Carlson

Inventor
Carl E. Stromquist
By *Casper L. Redfield* *Atty*

UNITED STATES PATENT OFFICE.

CARL E. STROMQUIST, OF CHICAGO, ILLINOIS, ASSIGNOR TO FRANK A. LUNDQUIST,
OF CHICAGO, ILLINOIS.

OIL BURNER.

Application filed March 31, 1922. Serial No. 548,295.

To all whom it may concern:

Be it known that I, CARL E. STROMQUIST, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Oil Burners, of which the following is a specification. My invention relates to oil burners, designed to use comparatively heavy oil, and has for its object improvements in devices of that character.

In the accompanying drawings—

Fig. 1 is a plan;

Fig. 2 is a sectional elevation;

Fig. 3 is a section on line 3—3 of Fig. 2; and

Fig. 4 is a section on line 4—4 of Fig. 2 with a portion broken away.

The circular casing 11 has a bottom 12 and a top 13, said parts being the exterior of a chamber 10. At one side is an inlet pipe 14 thru which air is forced into the chamber 10 by a fan or other device which will cause the air pressure inside of the chamber to be somewhat greater than it is outside.

The central part of the cover 13 is provided with an opening 15, and beneath this is a tube 16 which extends down into the lower part of the chamber 10. Secured in the tube 16 is a bracket 17 on which is supported an elbow 18. Extending upward from this elbow is a pipe 19 which has secured on its upper end a small circular casing 20. A cover 21 is held in place by a nut 22 screwed on the end of pipe 19. Within the casing 20 the pipe 19 has discharge branches 23 thru which oil is conveyed to the interior of the casing 20. Such oil is conveyed to the pipe 19 by a pipe 24 which is connected to the side of the elbow 18 and extends outward to any suitable source of supply.

Extending downward from the bottom of the casing 20, and surrounding the pipe 19, is a tubular extension 25 which terminates in a cone 26 having a flange 27. Secured to the flange 27 by screws 28 is a plate or disk 29. The central part of the bottom of the casing 20 is slightly raised, as shown in Fig. 2, and thru this thickened part are small holes 30 which connect the interior of the casing 20 with the interior of the tube 25.

The plate 29 has a central boss 31, and against this boss is another plate or disk 32 held in place by screws 33. Around the boss

31 is an annular recess 34, and thru the plate 29 are small holes 35 which connect the interior of the cone 26 with the recess 34. Outside of the recess 34 the plate 29 is of a little less thickness than it is at the boss with the result that there is a thin horizontal space between the plates 29 and 32 at their outer edges. This space is maintained at a uniform size by a series of washers 36, shown best in Fig. 4.

Surrounding the pipe 19, and extending thru plates 29 and 32, is a tube 37 which connects the interior of the cone 26 with a pipe 38 which extends outside of the casing 11 to a convenient supply of gas or some volatile liquid like alcohol. The lower end of the tube 37 is closed as shown, but the upper end is in communication with the space in the cone by means of holes 39.

Mounted upon the cover 13 is a cage made up of rings 40 and 41 connected together by screws 42. This cage surrounds the plates or disks 29 and 32 in about the manner shown in Fig. 2. The diameter of the opening in the top of the ring 41 is somewhat less than the diameter of these plates or disks.

In the top face of the cover 13, and between the opening 15 and the ring 40, is a shallow annular recess 43. Below the cover 13, and directly under the recess 43, is an annular pipe 44 which is connected with the recess 43 by short nipples 45. The upper ends of these nipples extend to a point about midway between the bottom and top of the recess 43, which recess is located directly below the outer edges of the disks 29 and 32. Connected to the lower part of pipe 44 is a waste pipe 46 which extends to any convenient point outside of the casing 11.

Located at a convenient place adjacent to the edges of the disks 29 and 32 are sparking points 47 which are connected by wires 48 with suitable electrical devices outside of the apparatus herein shown.

The device shown in the drawings is designed for heating purposes, as for house heating. It may be used either for heating air or water. The device is placed inside of a suitable furnace, and combustion occurs above ring 41, and below the casing 20.

In setting up the device the pipe 14 is connected to a fan or other device for forcing a current of air into the chamber 10. The air flowing inward flows around the

tube 16, and entering below flows uniformly upward into the cage 40—41. Here it first flows radially outward, then upward, and then inward and upward along the cone 26.

5 By making the tube extend down to near the bottom of the chamber 10, there is no tendency for the incoming current of air thru tube 14 to cause the upward current to flow unevenly around the edges of the disks 29
10 and 32.

The pipe 24 is connected to a source of oil supply, but oil is not permitted to flow thru this pipe until the device has been started by other means.

15 The pipe 38 is connected to an ordinary gas main, and the flow of gas therethru is controlled by an ordinary valve or cock operated by hand. In starting, this pipe is opened and the fan started at about the
20 same time. The gas flows thru the pipe 38, then upward thru tube 37, outward thru holes 39 into cone 26, downward thru holes 35 into recess 34, and then radially outward between disks 29 and 32 where it meets air
25 flowing upward around the edges of said disks. At about the time the air and gas meet, or soon after it, the electrical devices connected to wires 48 are operated to produce a spark at 47 which will ignite the
30 mixed air and gas. The resultant flame extends above the cone 26 and around the casing 20, the effect of which is to heat up said casing.

35 After the device has run for a few minutes in this way, the pipe 24 is opened by hand to admit oil, which oil flows upward thru pipe 19 and is discharged thru the branches 23 against the outer wall of the casing 20. As this casing is at this time
40 surrounded by burning gas, it is heated and causes the gasification of the oil. This oil gas then flows downward thru openings 30, tube 25, cone 26, holes 35, recess 34 and space between disks 29 and 32, at the outer
45 edges of which it meets the incoming air and is burned. As soon as this occurs, the gas coming thru pipe 38 is shut off and thereafter the device is maintained in operation
50 by gas manufactured in casing 20 by the heat of the combustion maintained under and around it. To stop operation, it is merely necessary to shut off the supply of oil flowing thru pipe 24.

55 If a supply of permanent gas for starting purposes is not available, then pipe 38 is connected to a supply of some volatile liquid as alcohol. In starting under these conditions, the alcohol is permitted to flow for a few minutes before the fan is started
60 to force air thru pipe 14. In this case the alcohol flows over the course given for gas until it reaches the edges of disks 29 and 32.

At this point it drips down into the recess 43 and forms a small annular pool not
65 deeper than the height to which the nipples

45 extend above the bottom of said recess. Under these conditions the alcohol will slowly vaporize. If now the current of air be caused to flow as before, it will pass over the surface of this pool and thru the liquid
70 dripping downward to it. This will cause an increased vaporization of the alcohol, and a mixture of the vapor and air. By simultaneous operation of the sparking device at this stage of the proceeding will ig-
75 nite the mixture and cause a preliminary heating as described for gas.

In case oil should be flowing thru pipe 24 when the fire is not burning, then the oil would drip down into the recess 43 and
80 overflow thru nipples 45 and pipe 44 to the waste pipe 46.

It is to be observed that the air is conveyed in an annular current past the edges of disks 29 and 32, and that the gas is pro-
85 jected radially into this annular current. The combustion is annular, and the gasifier 20 is located within this annular combustion. Taken together, the disks 29 and 32 may be considered as a disk having a disk-shaped
90 passageway therein for gas.

What I claim is:

1. In a device of the class described, a pair of disks supported adjacent to each other so that their faces at the edges will be
95 separated by a small space, washers between said disks near their edges and serving to determine the size of the space therebetween, means for conveying a gas into the space be-
100 tween the disks and discharging it in a thin sheet thru said small space at the edges, and means for conveying a current of air past the edges of said disks in a direction perpen-
105 dicular to the flow of gas from between the disks.

2. In a device of the class described, a pair of disks supported upon a common axis and having their edges separated by a small space by spacing means secured therebe-
110 tween near the edges of the disks, means for conveying a gas into the space between the disks and discharging it radially thru said small space, and means for conveying an annular current of air past the edges of
115 said disks.

3. In a device of the class described, a pair of disks supported on a common axis and having their edges separated by a small space, an oil induction pipe located at the
120 axis of said disks, a gasifier located at the upper end of said pipe and arranged to receive oil conveyed therethru, a return passageway from the gasifier to the space between said disks, and means for conveying
125 an annular current of air past the edges of said disks.

4. In a device of the class described, a pair of horizontal disks having their edges separated by a small space, a gasifier located
130 above the disks, a channel thru which gas

is conveyed from the gasifier to the space between said disks and from which gas is discharged in a thin horizontal sheet, and means for conveying an annular current of air past the edges of said disks, said parts being so arranged that upon combustion occurring, such combustion will be above said disks and below and around said gasifier.

5. In a mechanism of the class described, devices for producing an annular current of air, a gasifier located at the axis of such annulus, a pair of disks supported on an axis which corresponds to the axis of the annulus and having their edges separated by a narrow space, connections by which gas may be conveyed from the gasifier and projected thru said narrow space into the current of air, and other connections by which gas from another source may be projected in the same way into the current of air.

6. In a device of the class described, a pair of disks on a common axis, means for securing said disks together at intervals near their edges, and spacing devices serving to determine their distance apart, said spacing devices being near to but slightly removed from the edges of the disks.

7. In a device of the class described, a pair of horizontal disks having their edges separated by a small space, a channel arranged to convey an annular current of air past the edges of said disks and project it inward above the disks, a gasifier located in the axis of the current of air and above the disks, and a passageway for conveying gas from the gasifier to the space between the disks.

8. In an apparatus of the class described, a passageway having an enlarged diameter near its upper end, said enlarged part having an annular recess in the lower wall thereof, a body located in said enlargement and having a disk-shaped passageway of a diameter substantially equal to the diameter

of the annular recess, and a discharge nipple projecting thru the wall of the enlargement and into said recess for a distance equal to about one-half of the depth of such recess.

9. In a device of the class described, a burner consisting of a pair of disks arranged so that combustion occurs in a ring adjacent to the edges of the disks, a gasifier located within said ring and heated thereby, means for conveying liquid hydrocarbon to said gasifier, and a passageway for conveying gas from the gasifier to the burner.

10. In a device of the class described, an air passageway having an enlargement at its upper end, a pipe supported at the axis of the passageway and extending beyond the upper end thereof, a gas producing chamber supported on the upper end of the pipe and supplied with oil thru said pipe, and a body located within said enlargement and having a disk-shaped passageway therein, the inner part of said disk-shaped passageway being in communication with the interior of said chamber to permit a flow of gas from said chamber outward thru said body.

11. In a device of the class described, a gasifier consisting of a chamber arranged to have its exterior engaged by flame, means for conveying oil to the interior of said gasifier, and a channel for discharging gas from said gasifier, said channel having its receiving openings within the gasifier elevated above the floor of the gasifier.

12. In a device of the class described, a burner arranged to discharge a disk-shaped stream of gas into an annular stream of air, a gasifier located above the burner and in the axis of the air stream, a channel serving to convey gas from the gasifier to the burner, and an additional channel for conveying gas from an outside source to the burner when the gasifier is not operating.

CARL E. STROMQUIST.