J. C. JOHNSON.

OIL BURNER CONSTRUCTION.

APPLICATION FILED MAY 29, 1916.

1,201,999.

Patented Oct. 17, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

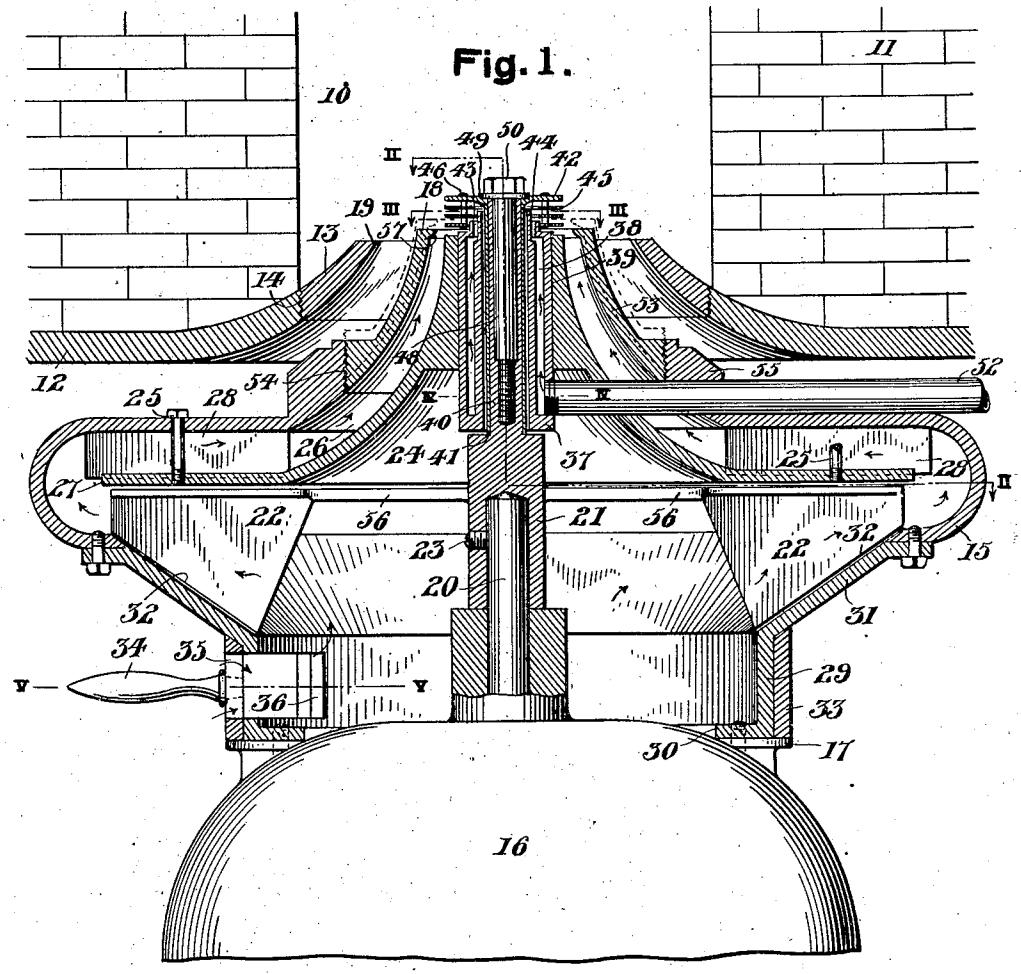


Fig. 3.

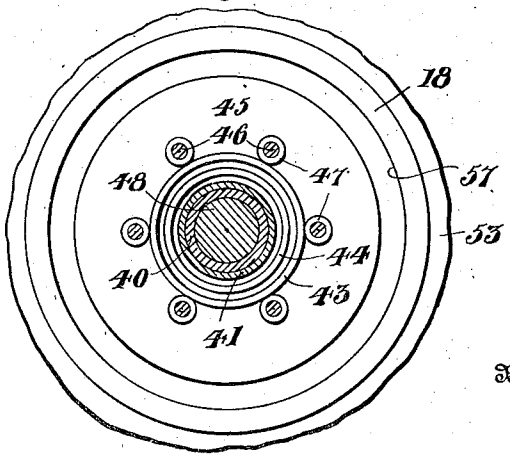
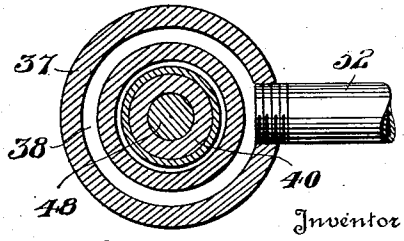


Fig. 4.



Inventor

Jesse C. Johnson

By Gustav W. Wiegand

Attorney

J. C. JOHNSON.

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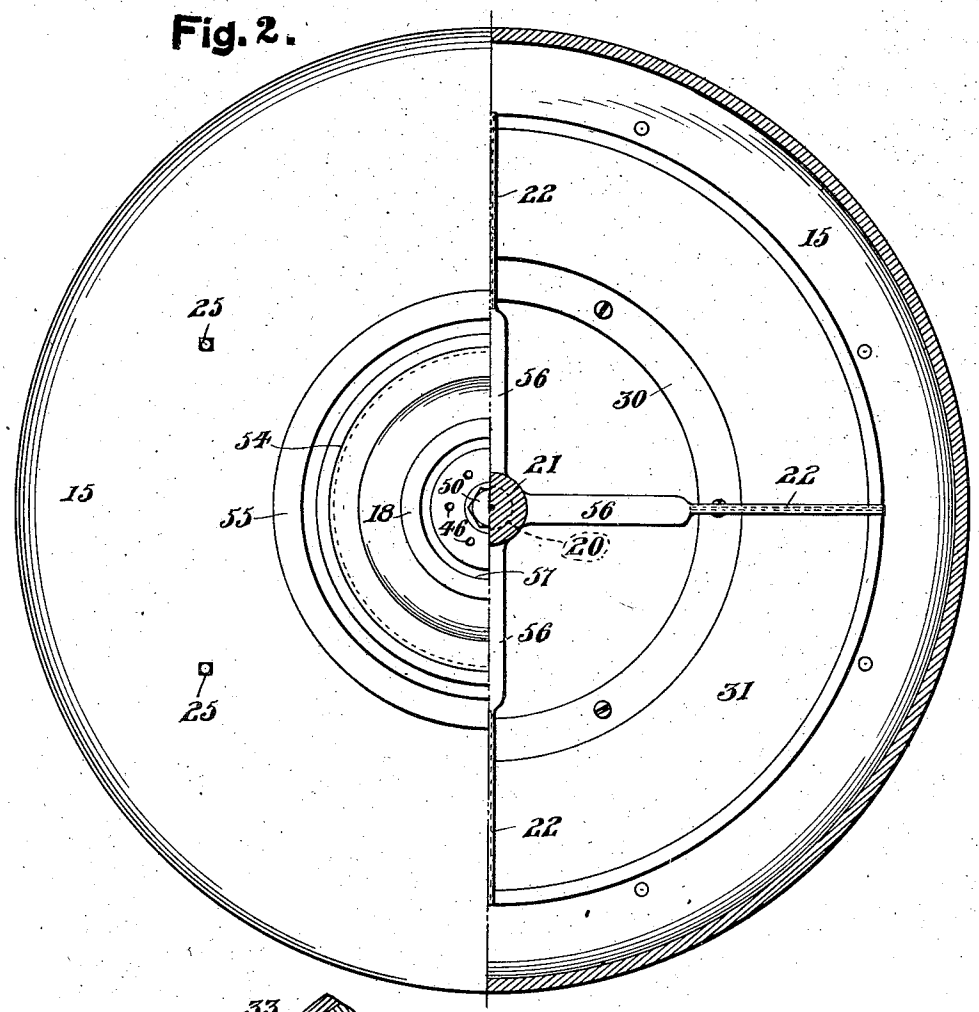
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2 SHEETS—SHEET 2.

Fig. 2.



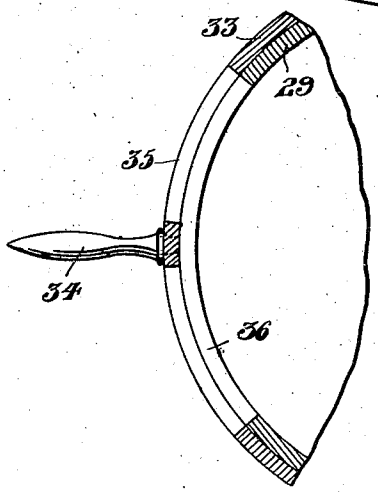


Fig. 5.

Inventor

Jesse C. Johnson

By Gustav W. Wiegand

Attorney

UNITED STATES PATENT OFFICE.

JESSE C. JOHNSON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO S. T. JOHNSON CO., OF SAN FRANCISCO, CALIFORNIA.

OIL-BURNER CONSTRUCTION.

1,201,999. Specification of Letters Patent. Patented Oct. 17, 1916.

Application filed May 29, 1916. Serial No. 100,652.

To all whom it may concern:

Be it known that I, JESSE C. JOHNSON, a citizen of the United States, residing at 1337 Mission street, San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Oil-Burner Construction, of which the following is a specification.

This invention relates to new and useful improvements in oil burner construction.

The primary object of this invention is the provision of a burner for fluid fuel adapted to provide a high efficiency of combustion and especially serviceable where great heat is desired, the present arrangement employing an advantageous atomizing means.

A further object of the device is to provide a fluid fuel burner serviceable in retorts, ovens or other desirable places, the same being arranged with a motor driven atomizer for the combustion fluid, members being adjustable whereby perfect atomizing and combustion is effected.

A further object of the device is to provide a burner which shall posses superior advantages in point of accessibility, durability and general efficiency.

The present device contemplates the arrangement of a burner casing upon a motor, the shaft of the latter operating an atomizing fan within the casing as well as revolving an atomizer positioned at the mouth of the burner, an annular oil chamber being arranged within the casing having a contracted outlet within the said atomizer.

With these general objects in view and others that will appear as the nature of the invention is better understood, the same consists in the novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and then claimed.

In the drawings forming a part of this application and in which like designating characters refer to corresponding parts throughout the several views, Figure 1 is a vertical central sectional view through the device with the motor broken away and the position of the fire-box being indicated. Fig. 2 is a top plan view of the device with one-half thereof being shown in horizontal section upon line II—II of Fig. 1. Fig. 3 is an enlarged transverse sectional view through the atomizer taken upon line III—III of Fig. 1. Fig. 4 is an enlarged detail sectional view taken upon line IV—IV of Fig. 1, and Fig. 5 is a horizontal sectional view through the air inlet taken upon line V—V of Fig. 1.

While the present device is employable wherever a burner is desired, the same is especially adapted for furnace use and is herein illustrated in connection with a fire-box 10 formed of the brick work 11 and having a protecting dome 12 provided with an adjustable tapered portion 13 projecting within the fire-box, the section 13 being screw-threaded as at 14 to the main portion of the dome 12.

The burner broadly consists of a casing 15 rigidly mounted upon an electric motor 16 being secured to opposite brackets 17 of the motor or in any other desirable manner, it being noted that the mouth 18 of the casing projects outwardly of the open end 19 of the tapered dome 13. The propelling shaft 20 of the motor 16 centrally projects inwardly of the casing 15 having the axle 21 of the fan blades 22 removably attached thereto by means of a screw 23.

A direction plate or member 24 of frusto-conical form conforming to the outlet end portion of the casing 15 is secured therein by means of bolts 25, being spaced from the upper wall of the casing 15, forming an annular outlet passage 26 for the circulating air set in motion by means of the fan blades 22. It will be understood that the outer edge 27 of the direction member 24 is spaced from the adjacent curved wall of the casing 15, while plates 28 are secured between the casing 15 and the outer edge portions of the deflecting member 24 by means of the said bolts 25, being designed to direct the air properly into the outlet passage 26 and to prevent any rotary movement of the air.

The casing 15 has an annular lower portion 29 provided with a bottom seating flange 30 and having an outwardly flaring upper portion 31, the blades 22 having inclined adjacent edges 32 slightly spaced from the said portion 31. A damper ring 33 is revolubly mounted upon the annular casing portion 29, being shiftable by means of the radially projecting handle 34, it being understood that suitable openings 35 are provided in the damper which are adapted to be brought into register with a similar opening 36 in the annular portion

29 for regulating the admission of air into the casing 15.

An oil dispenser 37 in the form of a sleeve and having an oil chamber 38 therein is secured within the central opening 39 of the direction member 24 with its outer or outlet end projecting beyond the said direction member 24.

The outer end portion of the axle 21 is reduced as at 40 upon which is secured a sleeve 41 terminating in an atomizing plate 42 outwardly of the free ends of the oil dispenser and directing member. A plurality of thin metallic plates 45 are dependingly carried by the outer plate 42 being secured thereto by means of rivets 46, spacing collars 47 being preferably arranged between the said plates. The outer wall of the oil dispenser 37 is drawn inwardly and flanged at its outer end as at 43 for the purpose of contracting the outlet opening of such dispenser while the inner wall thereof is of greater length than the outer wall and is reduced as at 44, the comparatively narrow outlet of the dispenser 37 being thereby positioned beneath the said atomizing plates 42 and 45 respectively.

A securing bolt 48 extends inwardly axially of the axle 21 and is provided with a washer 49 overlying the disk 42, the said bolt terminating in a head 50 whereby the bolt may be properly positioned, it being understood that the latter is preferably threaded into the said axle. An oil supply pipe 52 extends through the casing 15 and direction member 24 and communicates with the chamber 38 of the oil dispenser.

The tapered outer portion 53 of the casing 15 has a screw-threaded attachment as at 54 with an enlarged or hub portion 55 of the casing and whereby the burner mouth 18 may be adjusted vertically with respect to the atomizer, an adjusted position thereof being shown by dotted lines in Fig. 1. The fan blades 22 are connected to the axle 21 by means of radially arranged arms 56, such blades, herein four being illustrated, being provided in any desired number, while these blades may be formed of slight curvature if found desirable.

The complete operation of the device will be apparent from the present detailed description thereof, it being understood that when the burner is desired for use, the motor 16 is started in operation, the turning of the motor shaft 20 effecting revolving of the fan member as well as the atomizer while the oil is conducted into the oil chamber 38 under suitable pressure from the pipe 52, the oil being reduced to a fine spray as it leaves the dispenser 37 being deposited upon the atomizing plates 42 and 45. The atomizer, when revolving at a high speed, causes the oil to be discharged by the centrifugal force through the spaces separating the atomizing plates 42 and 45. Simultaneously with the discharge of fuel oil from the periphery of the atomizing plates 42 and 45, occurs a flow of air from the fan blades 22, further atomizing the fuel oil and throwing the same forward into the fire-box. The admission of air is regulated by means of the handle 34 and by controlling the speed of the motor.

The point of reception of the air upon the atomizer is controlled by regulating the height of the adjustable casing portion 53, the air being directed inwardly upon the atomizer by means of the inwardly projecting annular flange 57 of the mouth portion 53.

This form of burner with the forced air draft from the motor driving fan produces an exceedingly hot blaze within the combustion chamber 10. Additional air will be conducted into the said combustion chamber through the dome opening 19, such air passing from points adjacent the motor 16 between the burner casing 15 and the dome 12.

A great advantage secured by the present construction over burners heretofore constructed is the facility and ease of its initial starting. The complete atomizing secured by this device does not require a first heating of the atomizer, the finely atomized fuel oil readily bursting into flame when leaving the atomizing plates.

While the form of invention herein shown and described is what is believed to be the preferable embodiment thereof, it is nevertheless to be understood that minor changes may be made in the form, proportion and details of construction without departing from the spirit and scope of the invention as hereinafter claimed.

The materials and finish of the several parts of this burner construction are such as the experiment and judgment of the manufacturer may dictate.

What is claimed as new is:—

1. A burner comprising in combination, a motor having a projecting shaft, a burner casing mounted upon the said motor and having a tapered mouth, an axle secured to the shaft of the said motor and extending outwardly of the said mouth, an atomizer removably attached to the free end of the axle, an oil supply member having an outlet adjacent the said atomizer, and an air ejecting fan upon the said axle within the said casing.

2. A burner comprising in combination, a motor having a projecting shaft, a burner casing mounted upon the said motor and having a tapered mouth, an axle secured to the shaft of the said motor and extending centrally outwardly of the said mouth, an atomizer removably attached to the free end of the axle, a direction member within the said casing spaced from the upper portion

thereof forming an air passage to the said mouth, an oil supply means and an air ejecting fan carried by the said axle inwardly of the said direction member.

3. A burner comprising in combination, a motor having a projecting shaft, a burner casing mounted upon the said motor and having a tapered mouth, an axle secured to the shaft of the said motor and extending centrally outwardly of the said mouth, an atomizer removably attached to the free end of the axle, a direction member within said casing spaced from the upper portion thereof forming an air passage to the said mouth, an annular oil container centrally carried by the said direction member surrounding the said axle and having a contracted outlet within the said atomizer and mouth, and air ejecting fan blades carried by the said axle inwardly of the said direction member.

4. A burner comprising a hollow casing having an adjustable contracted mouth portion, a central axle within said casing, atomizing plates detachably carried by the said axle surrounding the outer end thereof at the mouth of the casing, a deflecting member interiorly carried by the said casing in spaced relation therewith and conforming to the upper portion thereof terminating adjacent the mouth of the casing, an oil feeding member carried by the said deflecting member, and an air ejector within the said casing inwardly of the said deflecting member.

5. A burner comprising a hollow casing having an adjustable contracted mouth portion, a central axle within said casing, atomizing plates detachably carried by the said axle surrounding the outer end thereof at the mouth of the casing, a deflecting member interiorly carried by the said casing in spaced relation therewith and conforming to the upper portion thereof terminating adjacent the mouth of the casing, an annular oil dispenser carried by the said deflecting member and having a contracted opening adjacent the said atomizing plates and an air ejector within the said casing adjacent the inner free end of the deflecting member.

6. A burner comprising a casing having a contracted mouth, an atomizer composed of a plurality of plates, the said mouth being adapted to be adjusted vertically with relation to the said atomizer, an oil dispensing member opening adjacent the said atomizer, an air directing member between the said casing and oil dispensing member, fan blades within the said casing and rotating means for the said blades and atomizer.

7. A device of the class described comprising a dome having an opening therein, a burner casing having an adjustable mouth portion extending outwardly of the said opening, a revoluble atomizer positioned centrally of the said mouth, plurality of plates carried by said atomizer, and an air ejector for the said mouth arranged within the said casing.

8. A device of the class described comprising a burner casing having a contracted mouth, a revoluble atomizer positioned centrally of the said mouth, an air deflecting member of similar shape to the upper portion of the said casing arranged therein and spaced therefrom forming an air outlet passage, an air circulating fan within the said casing adjacent the inner open end of the said passage and an oil dispenser having an outlet adjacent the said atomizer, and means for delivering oil to the said dispenser.

9. A device of the class described comprising a burner casing having a contracted mouth, a revoluble atomizer positioned centrally of the said mouth, an air deflecting member of similar shape to the upper portion of the said casing arranged therein and spaced therefrom forming an air outlet passage, an air circulating fan within the said casing adjacent the inner open end of the said passage, an annular oil dispenser carried by said deflecting member having a contracted outlet opening within the said atomizer and an oil supply pipe for the said dispenser extending through the said casing and deflecting member.

10. A device of the class described comprising a burner casing having a contracted mouth, a revoluble atomizer positioned centrally of the said mouth, an air deflecting member of similar shape to the upper portion of the casing arranged therein and spaced therefrom forming an air outlet passage, an air circulating fan within the said casing adjacent the inner open end of the said passage, an annular oil dispenser carried by the said deflecting member having a contracted outlet opening within the said atomizer, an oil supply pipe for the said dispenser extending through the said casing and deflecting member, an air controlling damper for the said casing at the opposite end thereof from the said atomizer and driving means for the said fan.

11. A device of the class described comprising a burner casing having a contracted mouth, a revoluble atomizer positioned centrally of the said mouth, an air deflecting member of similar shape to the upper portion of the said casing arranged therein and spaced therefrom forming an air outlet passage, an air circulating fan within the said casing adjacent the inner open end of the said passage, an annular oil dispenser carried by the said deflecting member having a contracted outlet opening within the said atomizer, an oil supply pipe for the said dispenser extending through the said casing and deflecting member, an air controlling

damper for the said casing at the opposite end thereof from the said atomizer, a combined driving means for the said fan and atomizer and mounting means for the said casing.

12. A device of the class described comprising a burner casing having a contracted mouth, a revoluble atomizer positioned centrally of the said mouth, an air deflecting member of similar shape to the upper portion of the said casing arranged therein and spaced therefrom forming an air outlet passage, an air circulating fan within the said casing adjacent the inner open end of the said passage, an annular oil dispenser carried by the said deflecting member having a contracted outlet opening within the said atomizer, an oil supply pipe for the said dispenser extending through the said casing and deflecting member, an air controlling damper for the said casing, a combined driving means for the said fan and atomizer, mounting means for the said casing, a firebox and a protecting dome for the said burner projecting within the said box.

13. A device of the class described providing a motor having a projecting shaft, a burner casing mounted upon the said motor concentric with the said shaft and having an open mouth in axial alinement therewith, an axle mounted upon the said shaft projecting outwardly of the said mouth, atomizing plates and a circulating fan carried by the said axle and an oil dispenser having an outlet adjacent the said atomizing plates.

14. A device of the class described providing a motor having a projecting shaft, a burner casing mounted upon the said motor concentric with the said shaft and having an open mouth in axial alinement therewith, an axle mounted upon the said shaft projecting outwardly of the said mouth, atomizing plates carried by the said axle, an oil dispenser having an outlet adjacent the said atomizing plates, means for delivering oil to the said dispenser, means for forcing an air current outwardly through the said mouth to deflect the fuel discharged from the said atomizing plates in a forward direction and to further atomize the fuel oil.

15. A device of the class described providing a motor having a projecting shaft, a burner casing mounted upon the said motor concentric with the said shaft and having an adjustable open mouth in axial alinement therewith, an axle mounted upon the said shaft projecting outwardly of the said mouth, an atomizer carried by the said axle and an oil dispenser having an outlet adjacent the said atomizer, means for forcing an air current outwardly through the said mouth to deflect the oil discharged from the atomizer in a forward direction, the said mouth having its opening portions adjacent the atomizer contracted inwardly to act as an agitator for the air current and atomized fuel.

In testimony whereof I affix my signature in presence of two witnesses.

JESSE G. JOHNSON.

Witnesses:
M. CHRISTENSEN,
A. J. BRADLEY.