S. T. JOHNSON.

OIL BURNER.

APPLICATION FILED JAN. 31, 1911.

1,009,525.

Patented Nov. 21, 1911.

3 SHEETS—SHEET 1.

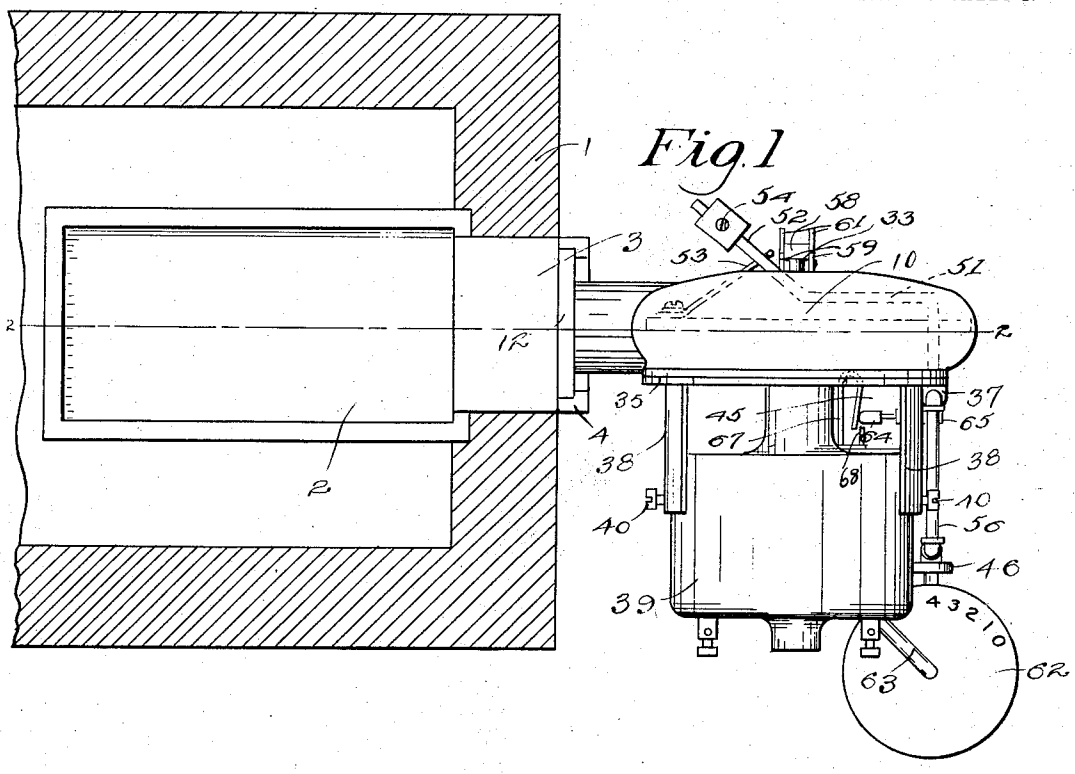

Fig. 1

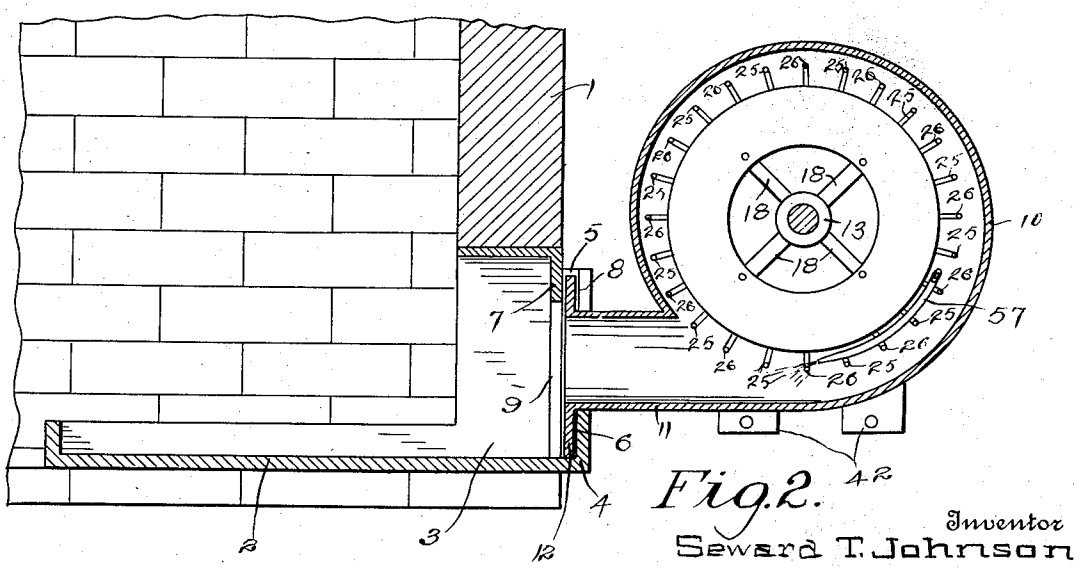

Fig. 2.

Witnesses

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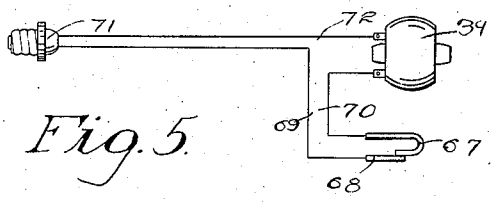

Fig. 5.

Fig. 3.

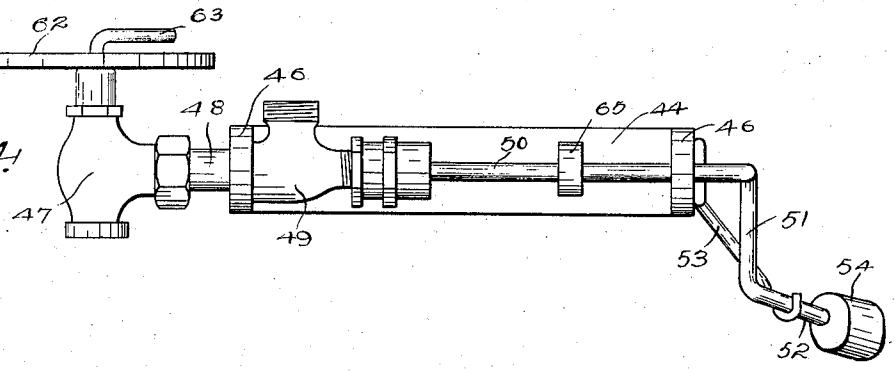

Fig. 4.

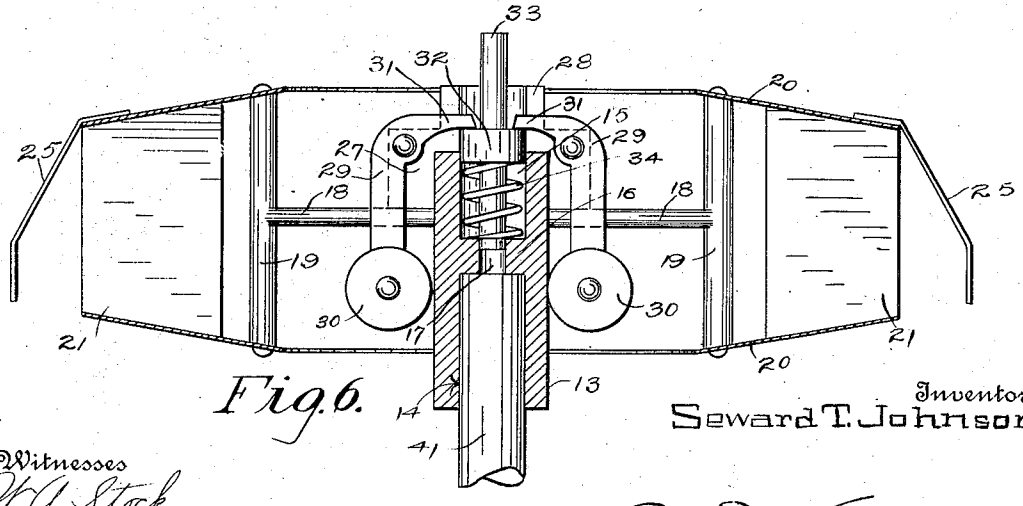

Fig. 6.

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3 SHEETS—SHEET 3.

Fig. 7.

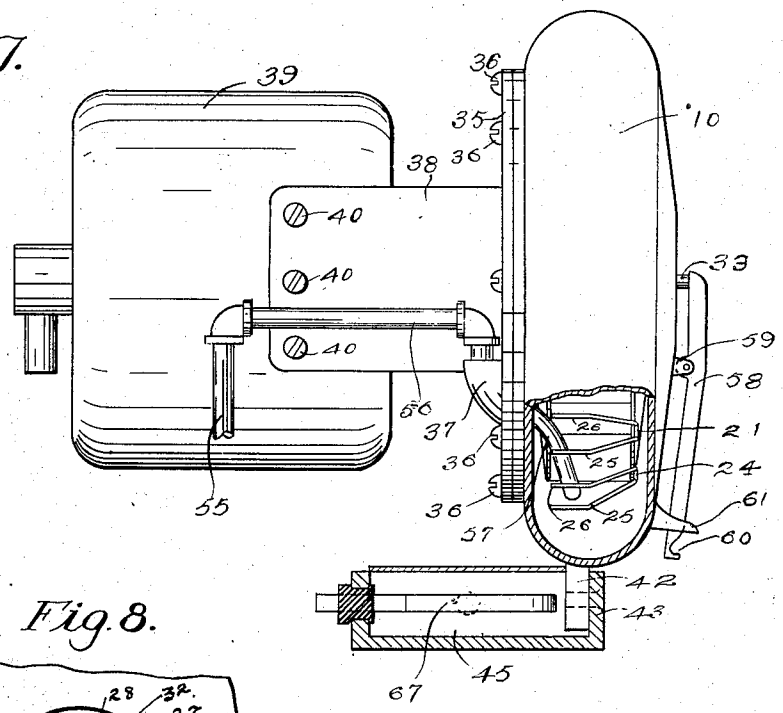
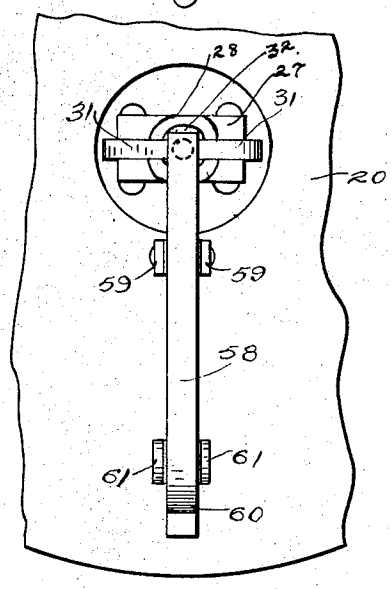


Fig. 8.



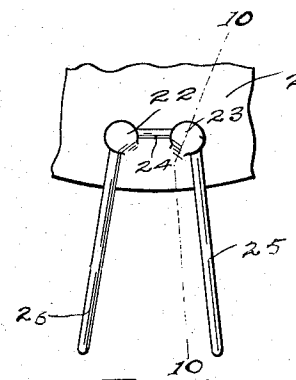


Fig. 9.

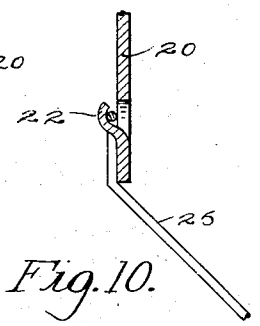


Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

SEWARD T. JOHNSON, OF OAKLAND, CALIFORNIA.

OIL-BURNER.

1,009,525. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed January 31, 1911. Serial No. 605,730.

To all whom it may concern:

Be it known that I, SEWARD T. JOHNSON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to oil burners, and the principal object of the same is to provide an improved means for atomizing oil.

The invention further has for its object to provide means for shutting off the supply of oil if the atomizing fan stops running.

This invention is illustrated in the accompanying drawings.

Figure 1 is a top plan view of the device as it would appear when in use. Fig. 2 is a sectional view along the line 2—2 of Fig. 1. Fig. 3 is a view of the means for shutting off the oil supply. Fig. 4 is a side view of the mechanism shown in Fig. 3. Fig. 5 is a diagram of the electric circuit. Fig. 6 is a sectional view through the fan. Fig. 7 is a view in rear elevation of the device, part of the device being shown in section on the line 7—7 in Fig. 3, and part of the casing being broken away. Fig. 8 is a fragmentary view of the outer face of the fan casing. Fig. 9 is a fragmentary view showing the manner of securing the wires of the fan. Fig. 10 is a sectional view along the line 10—10 of Fig. 9.

In the accompanying drawings 1 indicates a fire box in which a pan 2 is rigidly mounted and is provided with an apron 3 mounted in the front wall of the fire box, and extending beyond the fire box a slight degree. The outer portion 4 of the pan is provided with a vertical slot 5 which forms a pair of spaced apart walls 6 and 7. The wall 6 is provided with a vertical slot 8, and the wall 7 is provided with an opening 9 positioned in alinement with the slot 8.

A fan is used in connection with this invention and is provided with a casing 10, the mouth piece 11 of which is provided with an end flange 12 which fits into the slot 5 formed between the walls 6 and 7, and communicating with the opening 9 formed in the wall 7. A fan is mounted within the casing 10, and comprises a hollow hub 13 which has its central opening divided into two compartments 14 and 15 by means of the web 16 having a central opening 17. A number of spokes 18 are secured to the hub and are provided with right angularly disposed heads 19, which with the spokes form T shaped structures. A circular plate 20 is secured at each side to the heads 19, and a number of blades 21 are secured between the outer ends of the plates 20. The plates 20 are each provided near the outer edge with a number of sets of lugs 22 and 23 which are struck from the plates and are arranged divergingly in respect to each other. Strips of wire are each bent to form a bridge 24 which fits beneath the lugs 22 and 23. A pair of arms 25 and 26 extend from each of the bridges 24 to the edge of the plate and are then bent across the space between the plates. The arms are bent away from the blades 21 for a portion of their length and are then bent parallel with the blades 21 so that there is a clear space left between the free ends of the wires and the blades 21.

The hub is provided with an enlarged portion 27 near one end and surrounding the chamber 15. This enlarged portion and the outer portion 28 of the chamber 15 are slotted to provide a groove for pivotally mounting a pair of levers 29. The levers are each provided at one end with a weight 30 and at the other end with an angled end 31 which passes through the slot of the end 28 and engages with a collar 32 mounted upon a shaft 33. The collar 32 is of such dimension as to easily slide through the chamber 15, and the shaft 33 is of such dimension that its inner end will fit into the opening 17 formed in the web 16.

A spring 34 is mounted upon the shaft 33 between the web 16 and the collar 32 and normally holds the shaft and levers in position as shown in Fig. 6, with the outer end of the shaft extending a short distance beyond the casing of the fan.

A plate 35 is secured to the fan casing 10 by means of screws 36 and is provided with an inlet 37 which permits communication with the interior of the casing. A pair of plates 38 are formed upon the plate 35 and extend from the fan casing.

A motor 39 is mounted between the plates 38 and is held in position by means of set screws 40. This motor can be adjusted so that its shaft 41 is in alinement with the hub of the fan, the end of the shaft 41 fitting into the chamber 14, and being tightly secured in place.

The fan is provided at its lower part with

a pair of lugs 42 by means of which it is secured to a frame work. The framework comprises a beam 43 and a beam 44 which extends outward near one end of the beam and is positioned at right angles to the same. A housing 45 is formed at the junction of the beams 43 and 44, and a lug 46 is formed at each end of the beam 44.

A valve 47 is provided with a pipe 48 which passes through the lug 46 at one end of the beam 44 and communicates with a shut-off valve 49 which is positioned between the two ears 46. A stem 50 leads from the shut off 49 and passes through the ear 46 at the other end of the beam 44. The outer portion 51 of the stem 50 is bent parallel with the beam 43 and is then bent away from the beam 43 to form the lever 52. The lever 52 of the stem 50 is supported by means of a bracket 53 which is bent downwardly from the beam. A weight 54 is adjustably mounted upon the lever 52 of the stem 50 and holds the stem in the position shown in Fig. 4. In this position the shut off 49 will be closed and the supply of oil will be cut off. The oil passes through the needle valve 47 and through the shut off 49 into a vertical pipe 55. The pipe 55 extends upwardly to a point above the inlet 37 and communicates with a horizontal pipe 56 which permits the oil to flow into the inlet 37. A pipe 57 leads from the inner end of the inlet 37 into the space between the wires 25 and 26, and the blades of the fan, as clearly shown in Figs. 2 and 7.

An arm 58 is pivotally mounted between a pair of hinge ears 59 and is provided at its lower end with a hook portion 60 which is positioned beneath a pair of abutments 61. The upper end of the arm 58 is positioned in alinement with the shaft 33, and the hook portion is in position to engage the lever 52 of the stem 50 when the rod is turned. When the lever 52 of the stem 50 is turned, the stem 50 is turned about one-third of a rotation, and this turn is sufficient to open the shut off 49 and permit oil to flow from the pipe 48 into the pipe 57.

The valve 47 is provided with the usual plate 62, which has the indicating numerals by means of which the amount of oil passing through the valve can be better regulated, as the lever 63 can be turned to a desired numeral and permit the valve to be opened a desired amount.

A plunger 64 is slidably mounted in the beam 44 and has one end protruding into the housing 45. The outer end of the plunger is in contact with a cam 65 formed upon the stem 50. The inner end of the plunger is provided with an insulating head 66 which is in contact with a spring arm 67 of an electric contact and when the stem is in the position shown in Figs. 3 and 4 the spring arm of the contact will be held away from the arm 68 so that the electric circuit will be broken. In Fig. 5 I have shown the electric circuit. It will readily be seen that the wires 69 and 70 are connected with the contacts 67 and 68. The wire 70 leads to one of the points of the motor, and the wire 69 leads to a plug 71. A short wire 72 leads from the plug to the second point of the motor.

In the operation of this device, the lever 52 of the stem 50 is raised and held in elevated position. This opens the shut off 49 and permits the oil to flow through the pipes into the pipe 57. It also permits the spring arm 67 to come in contact with the stationary arm 68 of the electric contact and set the fan in motion. As the fan revolves the weights 30 swing outwardly and cause the ends 31 to move the shaft 33 into the opening 17, almost entirely drawing the outer end of the shaft into the fan casing. This will permit the arm 58 to be rocked upon its pivot point so that the lever 52 can be engaged by the hook portion of the arm and hold the shut off open. As the fan revolves the wires passing the mouth of the pipe 57 move rapidly, and as the oil flows out of the pipe it is broken up into a large number of very small particles. The fan causes this broken oil to mix with the air and forces the air and oil into the fire box where it is burned. If, for any reason, the power should fail and the fan stop turning it would be necessary to shut off the supply of oil and this is accomplished in the following manner: When the fan begins to run slowly the centrifugal force of the weights is lessened and the spring 34 forces the shaft 33 outwardly until the outer end of the shaft comes in contact with the upper end of the arm 58 and moves it away from the fan casing. This moves the lower end toward the fan until the lever 52 of the stem 50 is released from the catch and drops to the bracket 53. When this happens the stem 50 will be turned and will shut off the valve 49 and also move the rod 64 into the housing 45 so that the spring arm 67 will be moved away from the arm 68 and this breaks the electric circuit. If the power returns to normal strength the fan cannot start unless the lever 52 is raised to permit the valve 49 to open and the electric contact to be brought into registry again. It will thus be seen that it is impossible for the oil to flow through the pipe without the fan running or for the fan to run without the oil being fed.

What I claim is:—

1. In an oil burner, an electrically operated fluid breaking and mixing device, a fluid supply pipe, an electric switch controlling the flow of current to said fluid breaking and mixing device positioned adjacent to said fluid pipe, a shut off valve

in said oil pipe, and common means for operating said valve and opening and closing said switch.

2. An oil burner comprising an electrically operated fan, means carried by said fan for breaking a stream of fluid, a fluid supply pipe, a valve in said pipe, an electric switch for controlling said fan, and common means for operating said switch and valve.

3. In an oil burner, an electrically operated fan, a fluid pipe having its outlet positioned adjacent said fan, means carried by said fan for breaking a stream of fluid, a valve for said fluid pipe, an electric switch, common means for operating said valve and switch, means for holding said operating means in a position to open said valve and close said switch, and means controlled by said fan for releasing said operating means to close said valve and open said switch.

4. In an oil burner, an electric fan, wires carried by said fan having their ends spaced from the blades of said fan, a fluid supply pipe having its outlet positioned between said wires and said fan, a valve connected with said pipe, an electric switch controlling said fan, and common means for operating said valve and switch.

5. In an oil burner, an electric fan, a casing for said fan, fluid breaking means carried by said fan, a fluid supply pipe entering said casing and having its outlet positioned between said fan and said breaking means, a switch controlling said fan, a valve connected with said pipe, common means for operating said valve and switch, means carried by said casing for holding said operating means in a position to open said valve and close said switch, and means operated by said fan to release said operating means to close said valve and open said switch.

6. In an oil burner, an electric fan, a casing for said fan, said fan having a hollow hub, a shaft slidably mounted in said hub and extended through said casing, a collar mounted upon said shaft, a spring mounted upon said shaft and contacting with said collar to normally hold said shaft beyond said casing, levers pivotally connected with said hub and engaging with said collar and adapted to move said shaft within said hub when said fan is rotated, fluid breaking means carried by said fan, a fluid supply pipe passing into said casing and having its inner end positioned between said fan and said breaking means, a valve for said pipe, an electric switch controlling said fan, common means for operating said valve and switch, an arm pivotally mounted upon said casing and having one end contacting with said shaft, the other end of said arm adapted to hold said operating means in a position to open said valve and close said switch, and said spring adapted to move said shaft outwardly to move said arm to a position to release said operating means from said arm to close said valve and open said switch.

7. In an oil burner, an electric fan, said fan being provided with side plates and with fan blades positioned between said side plates, one of said side plates provided with a plurality of sets of divergently arranged catches positioned near its outer edge, wire fluid breaking means carried by said catches, each of said breaking means formed from a single length of wire bent intermediate its length to form a bridge adapted to be engaged by said catches, the remaining portion of said wire forming arms extending from said catches to the edge of said plate, and being bent across said fan blades and spaced from said blades, a casing surrounding said fan, a fluid supply pipe leading into said casing and having its inner end positioned between said wires and said fan blades, a valve for said supply pipe, a switch for said fan, and common means for operating said valve and switch.

8. In an oil burner, an electric fan, fluid breaking means carried by said fan, a casing for said fan, a frame supporting said casing, a housing carried by said frame, an electric switch in said housing, a fluid supply pipe supported upon said frame and leading into said casing, a valve carried by said pipe, a rod leading from said valve and supported intermediate its length upon said frame, means carried by said rod for operating said switch, and means carried by said casing for holding said rod in a position to open said valve and close said switch, and means for releasing said rod to close said valve and open said switch.

9. In an oil burner, an electric fan, a casing for said fan, a frame supporting said casing, a fluid supply pipe leading into said casing, means carried by said fan for breaking a stream of fluid, a valve carried by said frame and communicating with said supply pipe, an operating rod supported by said frame, and connected with said valve, an electric switch carried by said frame and having a spring arm, a plunger mounted in said frame, and contacting with the spring arm of said switch, a cam carried by said rod and contacting with said plunger to operate said switch, one portion of said rod extending beyond said frame and formed into an operating lever, means for normally holding said lever in a position to close said valve and open said switch, means carried by said casing for holding said lever in a position to turn said rod to open said valve and close said switch, and means carried by said fan for automatically releasing said lever to permit said lever to return to its nor-

mal position and close said valve and open said switch.

10. An atomizer including a fluid breaking and mixing device, a supply pipe for said breaking and mixing device, power means for operating said breaking and mixing device, a control for said supply pipe, a control for said power means and means operated by said breaking and mixing device for simultaneously operating said controls.

11. An atomizer including a fluid breaking and mixing device, power means for operating said breaking and mixing device, a supply pipe for said breaking and mixing device, a control for said supply pipe, a control for said power means, and means operated by said breaking and mixing device for operating said controls.

12. In an oil burner, a fan, means carried by said fan for breaking a stream of fluid, a pipe for supplying fluid to said breaking means, a control for said pipe, a control for said fan, and means operated by said fan for operating said controls.

13. In an oil burner, a casing, a fan in said casing, fluid breaking means carried by said fan, a fluid supply pipe entering said casing and discharging fluid across the path of said breaking means, a control for said pipe, a control for said fan, and means operated by said fan for operating said controls.

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

SEWARD T. JOHNSON.

Witnesses:
H. C. SCHROEDER,
F. P. SCHROEDER.