J. T. DALCHER.

OIL BURNER FOR STOVES, FURNACES, &c.

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1,396,166.

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Fig. 1.

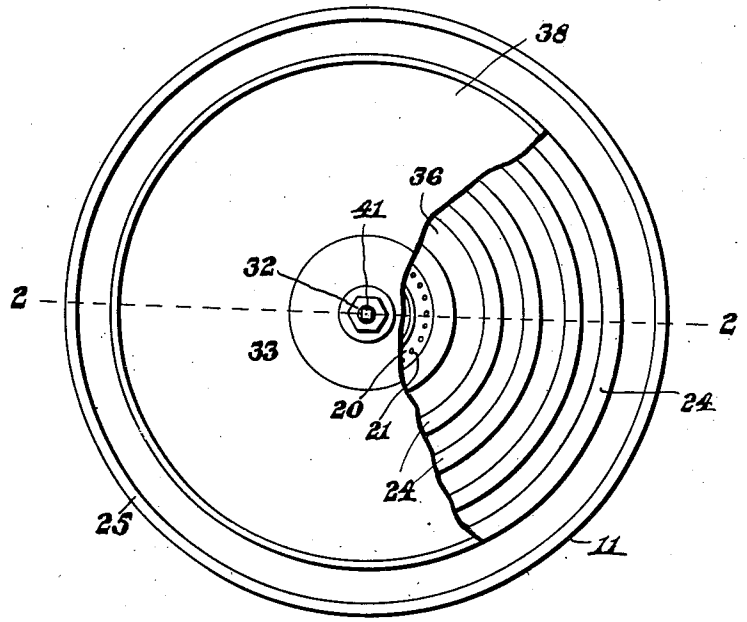
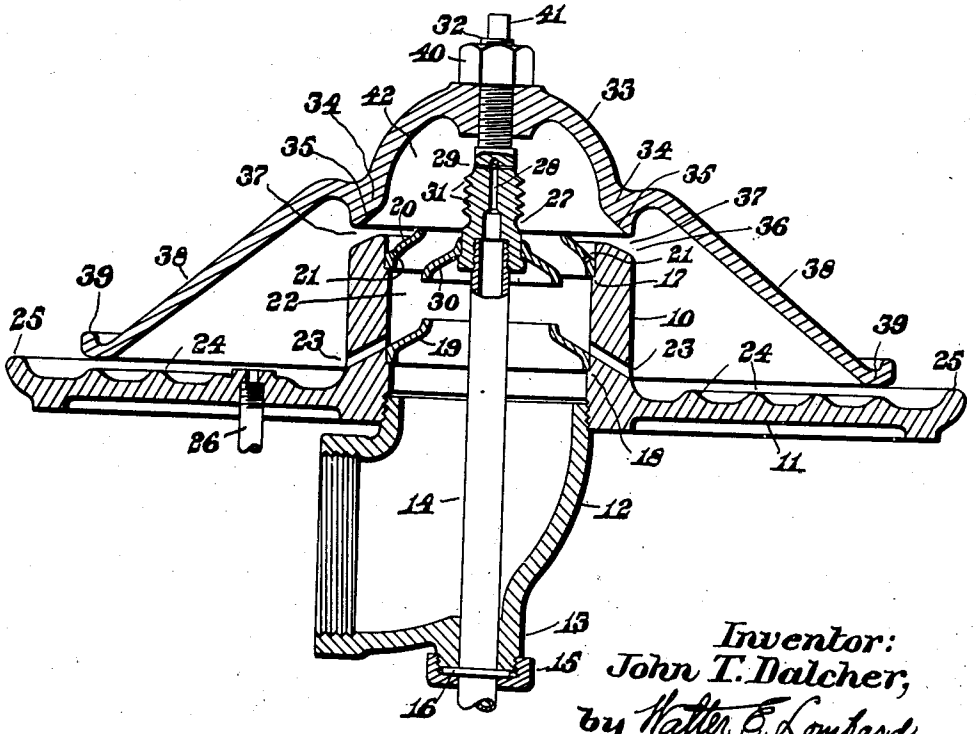


Fig. 2.



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UNITED STATES PATENT OFFICE.

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OIL-BURNER FOR STOVES, FURNACES, &c.

1,396,166. Specification of Letters Patent. Patented Nov. 8, 1921.

Application filed April 4, 1921. Serial No. 458,438.

To all whom it may concern:

Be it known that I, JOHN T. DALCHER, a citizen of the United States of America, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Oil-Burners for Stoves, Furnaces, &c., of which the following is a specification.

This invention relates to oil burners adapted for use in stoves, furnaces, and the like and is an improvement on another invention of mine shown and described in U. S. Letters Patent No. 1,281,301 issued to me Sept. 12, 1918.

The object of the present invention is the production of a device of this character which will be simple in construction, effective in operation, and efficient in fuel consumption.

The invention consists primarily in a tubular member forming a mixing chamber and surrounded by an oil pan above which is a hood adjustable toward and from said pan.

The invention further consists in certain novel features of construction and arrangement of parts which will be understood readily by reference to the description of the drawings and to the claims to be hereinafter given.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a plan of a device embodying the principles of the present invention, a portion being broken in section, and

Fig. 2 represents a vertical section of same on line 2, 2, on Fig. 1, said figure being drawn to an enlarged scale.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a tubular member surrounded by an open pan 11 preferably formed integral therewith.

This tubular member 10 is supported by and preferably threaded to an elbow pipe fitting 12 having a tubular boss 13 through which extends an oil supply pipe 14.

The outer end of the boss 13 has threaded thereto a nut 15 between which and the end of said boss is a packing member 16 which prevents the leakage between said pipe and the inner wall of the cylindrical hole through the boss 13.

The tubular member 10 is provided with two annular shoulders 17 and 18 on the inner face thereof, these shoulders being spaced apart as indicated in Fig. 2 of the drawings.

On the lower shoulder 18 is supported a cone-shaped annular air diffuser 19 and in a similar manner another cone-shaped annular air diffuser 20 is supported upon the upper shoulder 17.

Near the periphery of the annular air diffuser 20 are a plurality of drain holes 21 through which the oil that does not vaporize may pass downwardly into the chamber 22 and through drain holes 23 in the tubular member 10 into the pan 11.

The upper face of the pan 11 is provided with a plurality of annular ribs 24, the height of which is less than the peripheral flange 25 of said pan.

Extending from the pan 11 is an overflow pipe 26.

The upper end of the oil supply pipe 14 has threaded thereto the oil distributer 27 having a central passage 28 therein communicating at its upper end with a plurality of discharge outlets 29.

Near the lower end of the air distributer 27, said distributer has mounted thereon a cone-shaped air diffusing ring 30 the periphery of which extends over the upper end of the annular air diffuser 19.

This air diffusing ring 30 is intermediate the annular air diffusers 19 and 20 as indicated in Fig. 2 of the drawings.

Between the air diffusing ring 30 and the discharge outlets 29, the oil distributer 27 is provided with a plurality of sharp peripheral projections 31 over which the oil discharged from the outlets 29 is adapted to flow.

The upper end of the oil distributer 27

is provided with a threaded shank 32 on which is adjustably mounted a hood 33 having on its under face an annular flange 34, the under face 35 of which is inclined downwardly and outwardly.

This flange 34 is immediately above the tubular member 10, the face 36 of the upper end of which is inclined downwardly and outwardly.

By turning the hood 33 on the shank 32, the hood 33 may be moved toward and from the oil pan 11 thereby varying the size of the annular discharge passage 37 from the mixing chamber.

This hood 33 is provided with a cone-shaped apron 38 inclined downwardly and outwardly toward the pan 10, the lower end 39 of which is immediately above the outer rib 24.

It is obvious, therefore, that when the hood 33 is adjusted toward and from the oil pan 11, the space between the outer rib 24 and the end 39 of the hood 33 will be varied in size.

When the hood is adjusted relatively to the oil distributer 27, it is locked in adjusted position by means of the nut 40.

The upper end of the shank 32 is provided with a squared end 41 by which the oil distributer 27 may be screwed onto the threaded upper end of the oil supply pipe 14.

The tubular member 10 may be supported entirely upon the pipe fitting 12 or the pan 11 may be supported in any other manner as desired.

Metal washer 16 is firmly secured to oil supply pipe 14 and when pressed against lower face of boss 13 by means of cap or nut 15, secures pipe 14 in its proper position.

The discharge outlets 29 may be horizontal as indicated in the drawings or inclined downwardly and outwardly as desired.

The drain holes 21 and 23 are provided to take care of such fuel as is not properly vaporized in the mixing chamber.

The overflow pipe leads to a drain tank and takes care of the fuel in the oil pan when combustion has ceased.

In the operation of the device, air at a moderate draft is supplied through the pipe fitting 12 and as this air is admitted to the chamber 22 its velocity and direction of flow is controlled by the annular air diffusing members 19 and 20 and the air diffusing ring 30 intermediate said diffusers 19 and 20.

When a limited quantity of fuel has been supplied through the oil pipe 14 and permitted to flow into the oil pan 11, through the discharge outlets 19 and allowed to flow down the upper surface of the ring 30 onto the annular diffusing member 19 and through the holes 23 into the pan 11, the device is ready for use.

The oil supply is then cut off and the fuel in the oil pan 11 is ignited.

The heat from the burning oil in the pan quickly transmits heat to said pan 11, the hood 33, and all of the parts within the chamber 22.

When these parts are sufficiently heated, the fuel and air is admitted to the chamber 22 through the oil supply pipe 14 and pipe 12.

The fuel-oil is preferably supplied to the pipe 14 from a gravity tank from which the oil flows to the burner by gravity.

As this tank forms no part of the present invention, it is deemed unnecessary to show the same in the drawings as a tank of any usual construction may be used for this purpose.

As the fuel-oil passes through the pipe 14 into the oil distributer 27 and through the discharge outlets 29 therefrom, said oil will flow over the sharp peripheral projections 31 downwardly onto the air diffusing ring 30.

This fuel as it passes from the discharge outlets 29 has become thoroughly heated owing to the heated condition of the various parts of the device due to the ignition of the oil in the pan 11.

The air which is admitted through the pipe 12 is discharged through the annular air diffuser 19 and its velocity is considerably increased due to the cone shape of said diffuser 19, the upper end of which forms a diverging nozzle.

As the air passes through the diverging nozzle of this diffuser 19, it is thoroughly heated and forced to change its direction around the diffusing ring 30 and then coming into contact with the cone-shaped under face of the upper annular air diffusing member 20, is deflected with increased velocity toward the oil distributer 27 thereby coming into immediate contact with the hot oil flowing over the surface of this oil distributer 27 from the discharge outlets 29.

The hot oil is thereby broken up and carried into the mixing chamber 42.

In the mixing chamber 42 the oil and air is further heated and thoroughly atomized and then discharged into the outer mixing chamber through the circular opening 37.

The face 35 of the flange 34 surrounding the mixing chamber 42 has a greater inclination than the coacting face 36 of the upper end of the tubular member 10 and consequently the velocity of the heated mixture is increased as it passes outwardly through the annular passage 37 and strikes the hot walls of the outer chamber between the cone-shaped apron 38 and the oil pan 11.

It is obvious therefore that in the present device any necessary adjustments may

be made according to the specific amount of fuel being used by simply adjusting the hood 33 toward and from the oil pan 11.

Any of the fuel which is not properly vaporized may pass directly into the outer mixing chamber through the drain holes 21 and 23 without going into the mixing chamber 42.

The provision of a number of circular ribs 24 provides a means for still further vaporizing the fuel which passes into the outer mixing chamber without having previously been formed into a perfect gas.

This makes a very simple and effective oil burner for furnaces, stoves, and the like which may be constructed at a minimum expense and may be easily installed.

It is believed that the operation and many advantages of the invention will be understood without further description.

Having thus described my invention, I claim:

1. A tubular member surrounded by an oil pan; an air pipe on which said tubular member is mounted; an oil pipe centrally disposed in said tubular member and having a plurality of radial outlets; and a hood mounted on the upper end of said oil pipe and adjustable toward and from said pan.

2. A tubular member surrounded by an oil pan; an elbow air pipe on which said tubular member is mounted and provided with a tubular boss; an oil pipe extending through said boss and centrally disposed in said tubular member, said oil pipe having radial outlets; and a hood supported by said oil pipe and adjustable toward and from said pan.

3. A tubular member surrounded by an oil pan; an elbow air pipe on which said tubular member is mounted and provided with a tubular boss; an oil pipe extending through said boss and centrally disposed in said tubular member, said oil pipe having radial outlets; a plurality of air diffusers surrounding said oil pipe below said outlets; and a hood supported by said oil pipe and adjustable toward and from said pan.

4. A tubular member surrounded by an oil pan; an elbow air pipe on which said tubular member is mounted and provided with a tubular boss; an oil pipe extending through said boss and centrally disposed in said tubular member, said oil pipe having radial outlets; a plurality of staggered air diffusers surrounding said oil pipe below said outlets; and a hood supported by said oil pipe and adjustable toward and from said pan.

5. A tubular member surrounded by an oil pan and having annular shoulders on its inner face; annular air diffusers supported by said shoulders; an air pipe communicating with the interior of said tubular member; an oil pipe centrally disposed in said tubular member and having radial outlets; an air diffusing ring surrounding said pipe and positioned above and separated from the lower annular air diffuser; and a hood above and adjustable toward and from said pan.

6. A tubular member surrounded by an oil pan and having annular shoulders on its inner face; annular air diffusers supported by said shoulders; an air pipe communicating with the interior of said tubular member; an oil pipe centrally disposed in said tubular member and having radial outlets; an air diffusing ring surrounding said pipe and positioned intermediate said annular air diffusers; and a hood above and adjustable toward and from said pan.

7. A tubular member surrounded by an oil pan and having annular shoulders on its inner face; annular air diffusers supported by said shoulders and inclined upwardly toward the center; an air pipe communicating with the interior of said tubular member; an oil pipe centrally disposed in said tubular member and having radial outlets; an air diffusing ring surrounding said pipe and positioned above and separated from the lower annular air diffuser; and a hood above and adjustable toward and from said pan.

8. A tubular member surrounded by an oil pan and having annular shoulders on its inner face; annular air diffusers supported by said shoulders and inclined upwardly toward the center; an air pipe communicating with the interior of said tubular member; an oil pipe centrally disposed in said tubular member and having radial outlets; an air diffusing ring surrounding said pipe and positioned above and separated from the lower annular air diffuser, said ring inclining downwardly from its central support; and a hood above and adjustable toward and from said pan.

9. A tubular member surrounded by an oil pan and having on its inner face annular shoulders spaced apart and provided with oil drain holes above the lower shoulder; annular inclined air diffusers positioned on said shoulders, the upper of which is provided with oil drain holes near its periphery; an air pipe communicating with the lower end of said tubular member; an oil pipe centrally disposed in said tubular member and having radial outlets; a hood above and adjustable toward and from said pan; and an air diffusing ring surrounding said oil pipe.

10. A tubular member surrounded by an oil pan and having on its inner face annular shoulders spaced apart and provided with oil drain holes above the lower shoulder; annular inclined air diffusers positioned on said shoulders, the upper of which is provided with oil drain holes near its periphery; an air pipe communicating with the lower end of said tubular member; an oil pipe centrally disposed in said tubular member and having radial outlets; a hood above and adjustable toward and from said pan; and

an air diffusing ring surrounding said oil pipe and inclined downwardly with its outer edge extending over the inner edge of the lower annular air diffuser.

11. A tubular member surrounded by an oil pan; an air pipe communicating with the lower end thereof; an oil supply pipe centrally disposed in said tubular member; and a hood adjustable toward and from said pan and having a downwardly extending annular flange positioned above said tubular member.

12. A tubular member surrounded by an oil pan and having a downwardly and outwardly inclined upper end; an air pipe communicating with the lower end thereof; an oil supply pipe centrally disposed in said tubular member; and a hood adjustable toward and from said pan and having a downwardly extending annular flange positioned above said tubular member and having an outwardly and downwardly inclined lower end face.

13. A tubular member surrounded by an oil pan; an air pipe communicating with the lower end thereof; an oil supply pipe centrally disposed in said tubular member and having discharge outlets; a hood adjustable toward and from said pan; and air diffusing members within said tubular member below said outlets.

14. A tubular member surrounded by an oil pan; an air pipe communicating with the lower end thereof; an oil supply pipe centrally disposed in said tubular member; an oil distributing member threaded to the upper end of said pipe and having a plurality of discharge outlets communicating with said pipe; a threaded shank extending upwardly from said member; and a hood threaded to said shank and adjustable toward and from said pan.

15. A tubular member surrounded by an oil pan provided with a plurality of annular ribs on its upper face; an air pipe communicating with the lower end thereof; an oil supply pipe centrally disposed in said tubular member; an oil distributing member threaded to the upper end of said pipe and having a plurality of discharge outlets communicating with said pipe; a threaded shank extending upwardly from said member; and a hood threaded to said shank and adjustable toward and from said pan, said hood being inclined outwardly and downwardly and adapted to coact with the outer rib.

16. A tubular member surrounded by an oil pan; an air pipe communicating with the lower end thereof; an oil supply pipe centrally disposed in said tubular member; an oil distributing member threaded to the upper end of said pipe and having a plurality of discharge outlets communicating with said pipe and a plurality of sharp peripheral projections; a threaded shank extending upwardly from said member; and a hood threaded to said shank and adjustable toward and from said pan.

Signed by me at Jersey City, N. J., this first day of April, 1921.

JOHN T. DALCHER.

Witnesses:
J. F. CHRISTENSEN,
C. E. STEWART.