Nov. 22, 1932. L. L. SCOTT 1,888,476

ROTARY OIL BURNER

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Fig. 1.

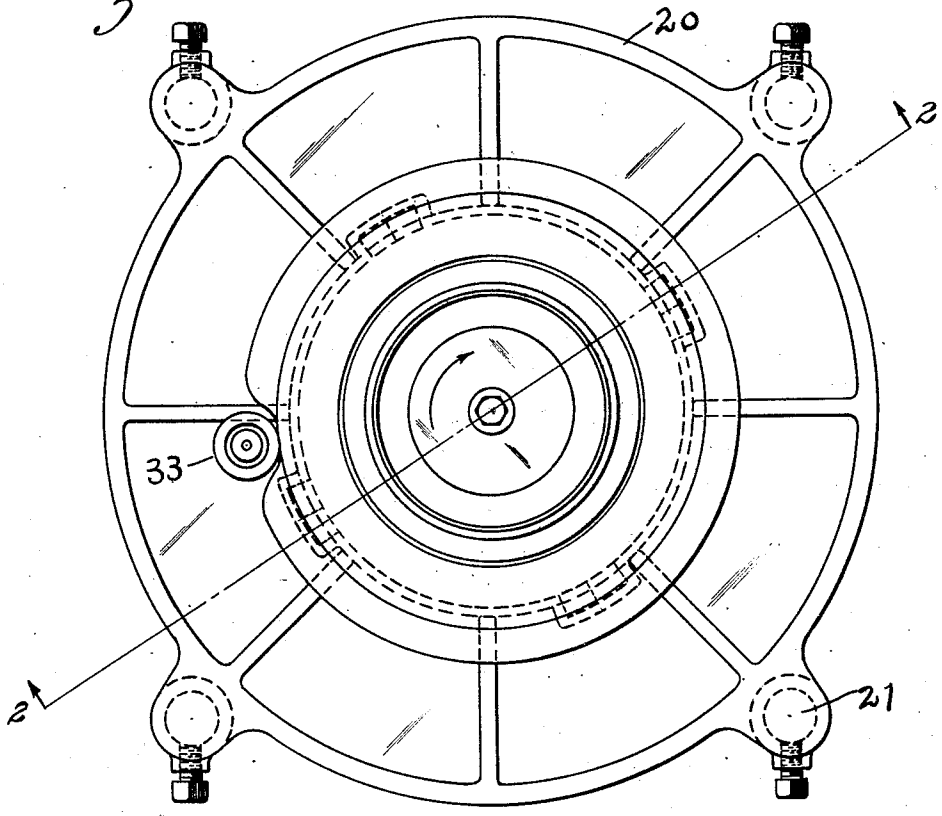
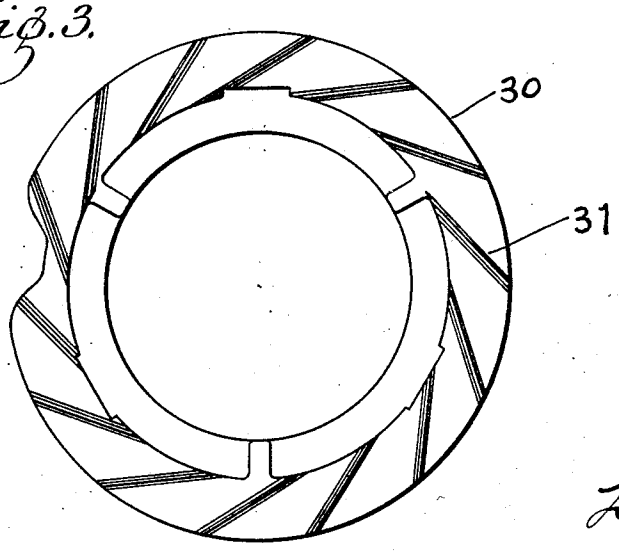


Fig. 3.



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Fig. 2.

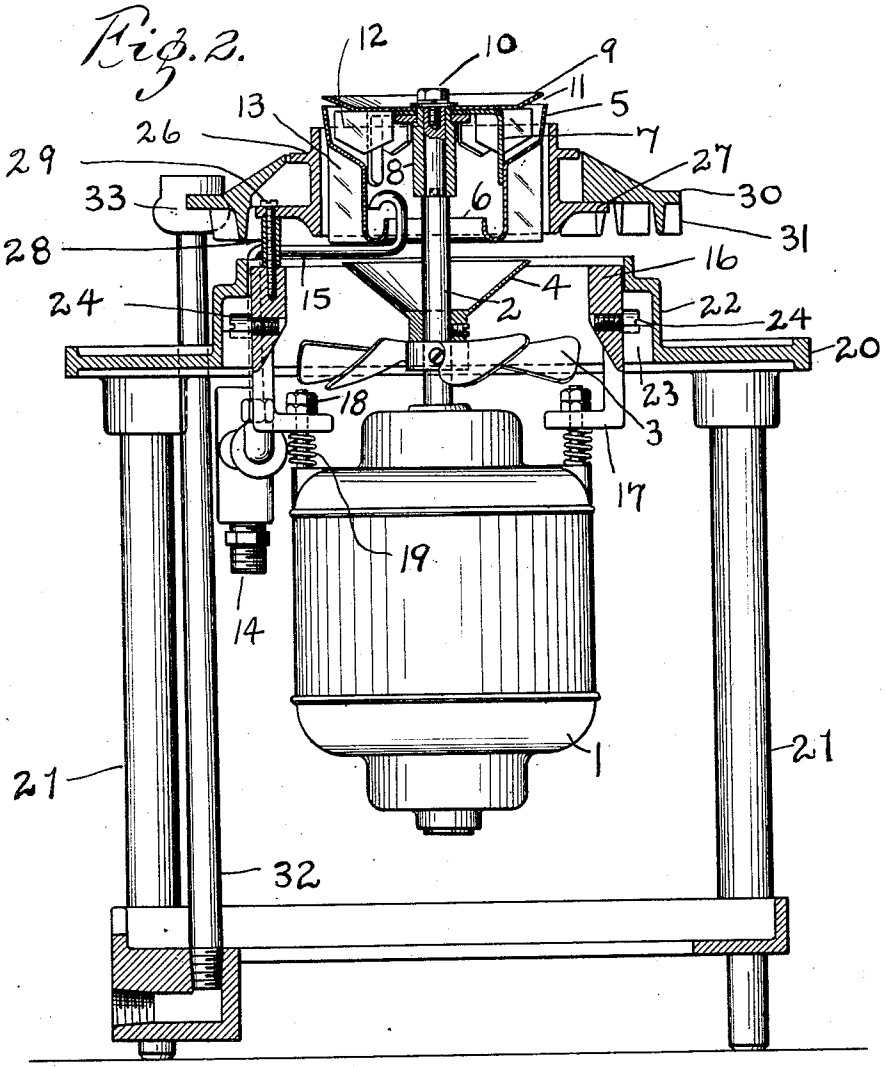
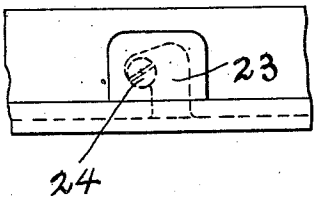


Fig. 4.



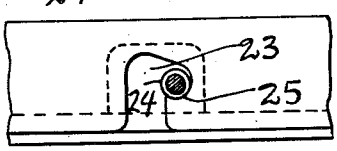


Fig. 5.

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UNITED STATES PATENT OFFICE

LEWIS L. SCOTT, OF ST. LOUIS, MISSOURI

ROTARY OIL BURNER

Application filed July 6, 1931. Serial No. 548,826.

This invention relates to rotary oil burners and has for its object to provide improvements by which certain advantages shall be obtained.

This rotary oil burner is designed particularly for burning relatively small quantities of oil, and is provided with a rotating cup into which oil flows. Said cup is rotated at a high speed and the oil is divided into very small particles and thrown off by centrifugal force. I have provided a fan for furnishing a blast of air to promote combustion, and have also provided an air distributing plate which rotates the air in the opposite direction of the oil film. The rotating cup is open at its lower end to provide for the entrance of the oil tube. I have found that dust that is circulating in the air will be drawn into the burner, due to the action of the fan or natural draft of the furnace, and some of this dust will be deposited on the inside of the rotating cup and will very materially affect the efficiency of atomization, because the dust will build up in lumps on the inside of the cup. I have provided a shield member below the rotating cup so as to prevent dust from entering, and still permit the entrance of the oil tube and also the entrance of air to the inside of the cup.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a plan view of my burner.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is a view showing the lower side of the air distributor plate and vanes on said plate.

Figure 4 is an outside fragmentary view of a portion of the top ring casting, showing the method of supporting the electric motor and parts connected thereto, to the top ring casting.

Figure 5 is a fragmentary view, the same as Figure 4, with the exception that the view is taken from the inside.

Referring now to the drawings, the numeral 1 indicates an electric motor, which is provided with an extended shaft 2. The numeral 3 indicates a propeller fan mounted on the motor shaft 2, and adapted to be rotated by the motor 1. The numeral 4 indicates a cup shaped member which is secured to the motor shaft 2, just above the fan, the purpose of which will be described later. The numeral 5 indicates a rotating atomizing cup which is adapted to be rotated by the motor shaft. The cup 5 is provided with an upward and inward extending portion 6, which prevents any oil, being distributed to the inside of the cup, from running out by gravity, particularly at the time the motor 1 is shut off. The numeral 7 indicates arms which are welded to the inside of the cup 5, which arms carry a central member 8, which member is mounted on the motor shaft 2 and supports the cup 5 and connected parts. The numeral 9 indicates a dish shaped member which is mounted just above the cup 5 and is secured to the motor shaft by the screw 10. The dish shaped member 9 is so arranged that an opening 11, between said member and the cup 5, is provided for the passage of the oil spray and also of air. The underside of the dish shaped member 9 is provided with a plurality of radially extending vanes 12, which vanes operate to create a draft of air up through the cup and out the opening 11, thus introducing air for purposes of combustion above the oil. The outside lower portion of the cup 5 is provided with a plurality of radially extending vanes 13, which vanes also operate to create a draft of air around the outside of the cup, which air passes to the under-side of the oil film and acts to prevent the burning film of oil burning too close to the rotating cup. The numeral 14 indicates an oil connection which runs to an oil supply, not shown. The numeral 15 indicates an oil pipe which connects to the oil connection 14 and runs up through the lower side of the cup 5, so that oil may be deposited on the interior of said cup. The numeral 16 indicates a circular ring, which ring is provided with four downwardly extending arms 17, which arms are adapted to support the motor 1 by the screws 18. Springs 19 are interposed between the motor 1 and the arms 17 so as to form a resilient mounting for the motor 1. The numeral 20 indicates a circular ring casting which is

supported at four points by the legs 21. The numeral 22 indicates an upwardly extending flange formed on the circular ring casting 20, said flange 22 being provided on the inside with slots 23. The circular ring 16 is provided with four screws 24, the heads of which screws are adapted to enter the slots 23 from below. By entering the screws 24 in the slots 23, with all parts connected, as shown in Figure 2, and by giving all parts a slight turn to the left, the screws 24 will rest on a ledge 25 formed adjacent to the slots 23, (see Figures 4 and 5). This will support the motor and all connected parts, as shown in Figure 2. The numeral 26 indicates a circular ring which is arranged around the rotating cup 5 and provided with a flange 27 near its lower portion. Flange 27 is adapted to rest on spacers 28 and is secured to the ring casting 16 by the screws 29. In practice, I provide four spacer washers 28 so that there is a liberal air space between the ring casting 16 and the flange 27. The numeral 30 indicates an air diffuser casting which is provided with vanes 31, which vanes serve to rotate the air in the opposite direction from the rotation of the cup. By referring to Figure 1, the arrow indicates that the cup is rotating clockwise. The air diffuser 30 is adapted to rest on the upper side of the flange 27 and is easily removable. The numeral 32 indicates a gas pipe connected to a source of gas supply, not shown. The numeral 33 indicates a gas pilot light connected to the pipe 32 for the purpose of igniting the atomized oil.

As indicated by Figure 2, this burner is of the vertical rotary type and is adapted to be set into the ashpit of a common house heating furnace. In practice, the circular ring casting 20 forms a support for building up insulating material so as to separate the ashpit part of the furnace from the combustion chamber where the oil is burned.

When the electric motor and oil flow is started, the oil will flow from the pipe 15 to the inside of the rotating cup 5 and will be ejected from the upper rim of the cup in a fine atomized spray, and will be ignited by the gas pilot 33. Air, provided by the fan 3, will be forced upward through the interior and around the exterior of the rotating cup 5, and will be mixed with the oil spray. Some of the air will be distributed through the vanes 31 and will be rapidly rotated in a direction opposite to the direction of the oil film, and said rotating air will thoroughly mix with the oil to promote combustion.

As before stated, I have found in practice that there is a tendency for dust, which floats around in the air, to be sucked in by the fan 3, and some of the dust will be distributed on the inside of the cup 5, and within a month's time, will practically destroy proper atomization of the oil, so that incomplete combustion will result. It is, of course, obvious that in some instances this condition will be more pronounced than in others, but where it does exist, the only remedy heretofore has been to remove the cup and thoroughly clean it. I have found that by placing a cup shaped member 4 just above the fan and below the atomizing cup 5, I can prevent dust from entering the inside of the cup, and at the same time, get good combustion. I have run a great number of tests where I purposely threw dust in around the motor, when the burner was in operation, and without the cup member 4, the dust would soon collect on the inside of the atomizing cup and destroy atomization. I found that by placing the cup shaped member 4, as shown in Figure 2, just above the fan, I could completely eliminate the collection of dust on the interior of the atomizing cup 5.

I claim:—

1. In a rotary type oil burner, an atomizing cup adapted to atomize oil, having an opening through which atomized oil and air is ejected, a motor adapted to rotate said cup, having a shaft connected to said cup, an inlet opening to the atomizing cup through which air may pass to the inside of said atomizing cup, means for distributing oil to be atomized to the interior of the atomizing cup, means located near the air entrance to the atomizing cup adapted to prevent dust which is carried in the air from entering the interior of the atomizing cup.

2. In a rotary type oil burner, an atomizing cup adapted to atomize oil, having an opening through which atomized oil and air is ejected, a motor adapted to rotate said cup, having a shaft connected to said cup, an inlet opening to the atomizing cup through which air may pass to the inside of said atomizing cup, means for distributing oil to be atomized to the interior of the atomizing cup, a circular member located near the air entrance to the atomizing cup adapted to prevent dust which is carried in the air from entering the interior of the atomizing cup.

3. In a rotary type oil burner, an atomizing cup adapted to atomize oil, having an opening through which atomized oil and air is ejected, a motor adapted to rotate said cup, having a shaft connected to said cup, an inlet opening to the atomizing cup through which air may pass to the inside of said atomizing cup, means for distributing oil to be atomized to the interior of the atomizing cup, a circular member located near the air entrance to the atomizing cup, said member being of larger diameter than the air entrance to said cup and being adapted to prevent dust which is carried in the air from entering the interior of the atomizing cup.

4. In a rotary type oil burner, an atomizing cup adapted to atomize oil, having an opening through which atomized oil and air is ejected, a motor adapted to rotate said cup, having a

shaft connected to said cup, an inlet opening to the atomizing cup through which air may pass to the inside of said atomizing cup, means for distributing oil to be atomized to the interior of the atomizing cup, a circular member secured to the motor shaft and adapted to rotate with said shaft located near the entrance to the atomizing cup adapted to prevent dust which is carried in the air from entering the interior of the atomizing cup.

5. In a rotary type oil burner, an atomizing cup adapted to atomize oil, having an opening through which atomized oil and air is ejected, a motor adapted to rotate said cup, having a shaft connected to said cup, an inlet opening to the atomizing cup through which air may pass to the inside of said atomizing cup, means for distributing oil to be atomized to the interior of the atomizing cup, a conical shaped member secured to the motor shaft and adapted to rotate with said shaft located adjacent to the air entrance to the atomizing cup adapted to prevent dust which is carried in the air from entering the interior of the atomizing cup.

6. In a rotary type oil burner, an atomizing cup adapted to atomize oil, having an opening through which atomized oil and air is ejected, a motor adapted to rotate said cup, having a shaft connected to said cup, an inlet opening to the atomizing cup through which air may pass to the inside of said atomizing cup, means for distributing oil to be atomized to the interior of the atomizing cup, a fan driven by the motor adapted to furnish air to the atomized oil to promote combustion, a conical shaped member secured to the motor shaft and adapted to rotate with said shaft located adjacent to the air entrance to the atomizing cup adapted to prevent dust which is carried in the air from entering the interior of the atomizing cup.

7. In a rotary type oil burner, an atomizing cup adapted to atomize oil, a motor adapted to rotate said cup, means for supplying air to the atomized spray to promote combustion, a circular air diffusing plate located below the plane of discharge of the atomizing cup and having peripheral, inclined vanes on its lower side adapted to rotate air in the opposite direction from the rotation of the atomizing cup.

In testimony whereof, I have affixed my signature to this specification.

LEWIS L. SCOTT.