June 22, 1937. R. M. SHERMAN 2,084,709

FLEXIBLE DRIVING CONNECTION FOR OIL BURNERS

Filed Dec. 9, 1935

Fig. 1.

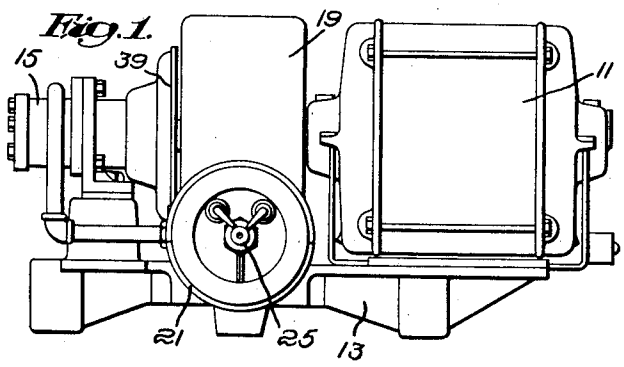



Fig. 2.

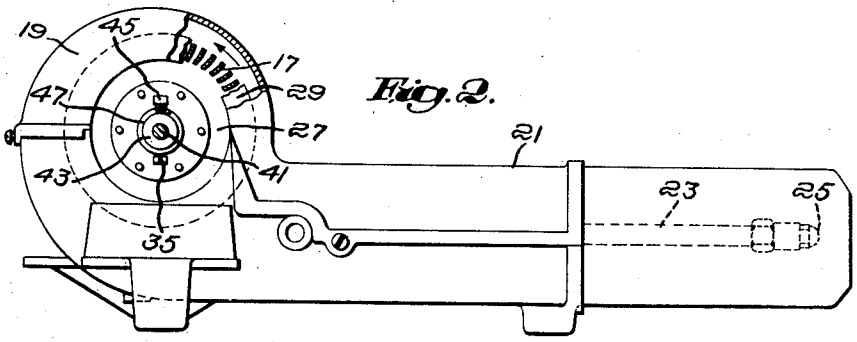



Fig. 3.

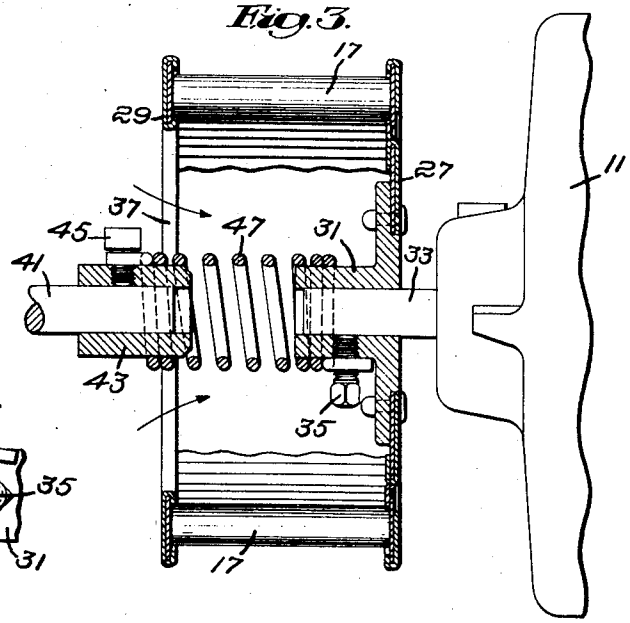
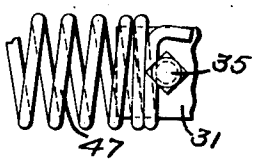



Fig. 4.




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Patented June 22, 1937

2,084,709

# UNITED STATES PATENT OFFICE

2,084,709

## FLEXIBLE DRIVING CONNECTION FOR OIL BURNERS

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Application December 9, 1935, Serial No. 53,595

4 Claims. (Cl. 103—4)

This invention relates to oil burners and more particularly to oil burners employing a rotary air impeller and an oil supply pump driven in approximately axial alignment from an electric motor, the impeller supplying air for the burner through an extended tubular air conduit and the pump supplying oil through an oil pipe and nozzle usually arranged coaxially within the conduit. In such burners, it is common to mount the air impeller between the motor and the pump, the impeller being driven directly from the motor and the pump also directly from the motor by a shaft passing through the fan.

In such constructions, the fan is usually of the so-called "Sirroco" type, having peripherally arranged fan blades and an air intake at one side through which the air enters and from which it passes outwardly to the blades and is discharged into the air conduit.

In the operation of such burners, the employment of a solid driving shaft passing through the fan tends to interfere with the even distribution of air from the air intake to the periphery of the fan, so that the capacity of the fan is not only appreciably reduced, but there results an uneven distribution of the air to different portions of the periphery of the fan casing, tending to render non-uniform the air velocity in different circumferential parts of the air conduit.

One object of the present invention is to correct in large part this condition by the employment of a driving connection between the motor and the pump passing through the fan casing but which will offer little interference to the distribution of the air within the fan, thereby increasing the efficiency of the fan and improving the operation of the burner, such driving connection being also of such a character that it cushions the shock on the motor in starting the pump, diminishes the noise incident to starting the burner, and renders inconsequential slight differences in alignment between the motor and the pump.

These and other objects of the invention will be better understood by reference to the following description when taken in connection with the accompanying illustration showing one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is a front view of a burner embodying one form of the invention, looking back from the mouth of the air conduit;

Fig. 2 is a side elevation of the burner, partly broken away to show the air impeller but with the pump removed;

Fig. 3 is an enlarged, cross-sectional elevation of the fan and impeller showing the driving connection; and

Fig. 4 is a detail showing the method of connecting the driving spring.

Referring to the embodiment of the invention submitted for illustrative purposes, the motor comprises an electric driving motor 11 mounted at one side of the support 13 and an oil pump 15 mounted at the opposite side of the support and in substantial axial alignment with the motor. Between the motor and the pump is a rotary air impeller or fan 17 of the so-called "Sirroco" type comprising a cylindrical, cage-like member rotatable in eccentric relation within the generally cylindrical housing 19, the air discharging portion of the casing merging into a prolonged, straight, cylindrical, tubular air conduit member 21, through which extends the oil supply pipe 23 having the oil discharge nozzle 25 at the end thereof.

The impeller comprises a disc-like side plate 27 adjacent the motor and an opposed annular plate 29 with interconnecting multiple vanes or blades, the disc having an inturned hub 31 which is secured directly to the motor shaft 33 by the set screw 35. The opposite annular side plate 29 provides an air admission opening 37 facing the pump, the amount of air admitted therethrough being controlled by a disc-like shutter 39 (Fig. 1) mounted on the pump structure, which disc may be adjusted to a fixed position after the burner has been installed.

The drive shaft 41 for the pump (Fig. 3) is spaced from the motor driving shaft 33 and from the fan hub 31 but has applied thereto a collar 43 of substantially the same diameter as that of the hub and fixedly secured to the pump shaft by the set screw 45. Closely fitting at one end over the hub 31 and at the opposite end over the spaced collar 43, and spanning the space between the two within the impeller cage, there is provided a driving connection in the form of a helical spring 47. The outermost coils at each end of the spring are preferably closely compacted to provide a good bearing seat on the hub at one end and on the collar at the opposite end, the intervening coils, however, being more or less open to permit the free passage of air transversely from one side of the impeller to the other without substantial interference.

Each end of the spring is turned at substantially right angles to form a bend or hook 49,

as indicated in Fig. 4. Such bent ends of the spring are free of connection to the set screws **35** and **45** but are in line therewith so that when the motor is started and the motor shaft is turned clockwise the screw **35** engages the bend of the spring, imparting a turning effort thereto which is transmitted through the resilient spring to the pump shaft as soon as the bend at the opposite end of the spring engages the body of the set screw **45**.

While I have herein shown and described for the purposes of illustration one specific embodiment of the invention, it is to be understood that extensive changes in the details and in the form or arrangement of parts may be made without departing from the spirit of the invention.

I claim:

1. In an oil burner, the combination with a rotary air impeller comprising an impeller housing, a cylindrical cage within said housing having peripheral fan blades and a lateral air intake, of a motor axially aligned with said impeller at one side thereof and having a driving shaft connected to drive the same, an oil pump at the opposite side of said impeller having a drive shaft, an inwardly projecting driving member on the side of the cage opposite said pump in substantial alignment with the pump drive shaft but spaced therefrom, and a helical spring driving connection between the driving member on the impeller and the pump shaft and spanning a space between said member and shaft.

2. In an oil burner, the combination with a rotary air impeller comprising an impeller housing, a cylindrical cage within said housing having peripheral fan blades and a lateral air intake, of a motor axially aligned with said impeller at one side thereof and having a driving shaft connected to drive the same, an oil pump at the opposite side of the impeller having a drive shaft in substantial alignment with said motor drive shaft but spaced therefrom, and a helical spring driving connection between said motor shaft and the pump shaft, said spring spanning a space between said shafts within the cage of said impeller.

3. In an oil burner, the combination with a generally cylindrical housing having an air inlet, of a rotary bladed impeller in said housing, a motor outside of and at one side of the housing and having a driven member entering said housing and connected to drive the impeller, an oil pump at the opposite side and outside of said housing, a member for driving the pump axially aligned with but distinctly spaced from the motor driven member, and a helical spring driving connection between said members having its ends embracing one the motor driven member and the other the pump driving member, said spring driving connection spanning the intervening space between said members and lying across the path of air entering said housing and passing to the impeller blades.

4. In an oil burner, the combination with a generally cylindrical housing having an air inlet, of a rotary bladed impeller in said housing, a motor outside of and at one side of the housing and having a driven member entering said housing and connected to drive the impeller, an oil pump at the opposite side and outside of said housing, a member for driving the pump axially aligned with but distinctly spaced from the motor driven member, and a helical spring driving connection between said members having its ends embracing one the motor driven member and the other the pump driving member, said spring driving connection spanning the intervening space between said members and lying across the path of air entering said housing and passing to the impeller blades, the two aligned but spaced members having radial abutments engageable by the respective spring ends, the latter and said abutments having capacity for relative angular movement.

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