June 11, 1935. A. R. STEVENSON, JR 2,004,771

OIL BURNER

Filed Feb. 28, 1931

Fig. 1.

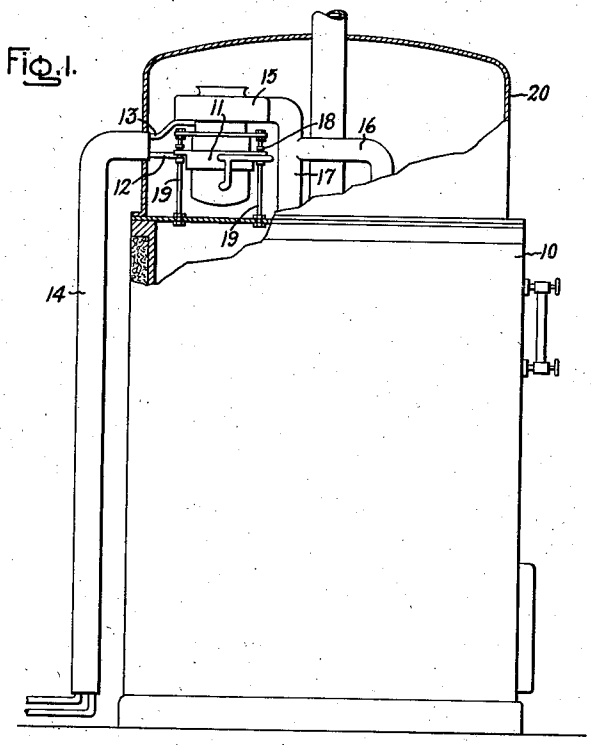
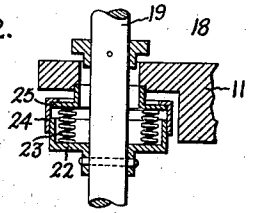


Fig. 2.



Inventor:
Alexander R. Stevenson Jr.,
by Charles F. Mullen
His Attorney

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2,004,771

OIL BURNER

Alexander R. Stevenson, Jr., Schenectady, N. Y., assignor to General Electric Company, a corporation of New York

Application February 28, 1931, Serial No. 519,200

1 Claim. (Cl. 158—1)

My invention relates to oil burners, more particularly the motor blower and compressor devices used for supplying oil and air to the nozzle of the oil burner.

It is known that oil burner motor blower units set up a noise and vibration during operation and no means has heretofore been provided for overcoming this objection. In oil burners of the type disclosed in an application of Elliott D. Harrington, filed Janaury 21, 1930, Serial No. 422,449 assigned to the same assignee, the oil burner blower compressor unit is mounted on top of the furnace proper with the result that there is noise from the unit.

Hence it is a principal object of my invention to provide a means for eliminating noise and vibration due to operation of motor blower units used in oil burners.

Briefly, the preferred embodiment of my invention consists of a closed housing or casing for surrounding the blower compressor unit which is mounted on top of an oil burner furnace. This casing acts as an insulator for noise from the unit. It is necessary, however, to provide an opening to the housing in order that the blower may be supplied with necessary air from the outside of the burner to provide for combustion within the oil burner proper. This is accomplished by the use of a long tubular member having an opening near the floor from which the blower unit is supported. This tubular member extends the length of the burner and opens into the casing surrounding the oil burner unit thereby supplying the necessary air but preventing noises from leaving. By placing the intake near the floor any faint noises which may find their way to the exterior of the tube are minimized since it is placed below the level of the ear of an observer, it being apparent that when noise issues from a source at a height near an observer's ear the noise will be more pronounced. The casing and the tube provide a sonic filter action to prevent noise which action will be more fully described below. Vibration of the unit is absorbed by means of a resilient mounting. In addition, due to the sub-atmospheric pressure in the casing covering the compressor unit any oil fumes passing up through the top of the furnace are prevented from leaving the casing and contaminating the atmosphere of the room in which the furnace is placed. Should the compressor unit catch fire for some unusual reason, the cover acts to smother the flame.

Referring to the drawing, Fig. 1 shows an embodiment of my invention applied to an oil burner furnace and Fig. 2 shows a resilient mounting for the compressor unit.

In Fig. 1 the oil burner is generally designated by the numeral 10. Resiliently mounted on top of the furnace is the blower compressor unit 11 which is electrically driven. This unit is resiliently supported upon the rods 19 by means of the resilient supporting elements 18 which are shown more in detail in Fig. 2. A casing 20 surrounds the unit. Oil under pressure is supplied to the unit by means of the conduit 12 and the electrical conduits for energizing the motor of the unit are shown at 13. Both these conduits extend up through the intake tube or duct 14 which supplies air from the exterior of the casing to the interior of the casing so that the blower 15 may deliver this air through the conduits 16 and 17 to the burner proper.

In Fig. 2 the resilient mounting is designated generally at 18. Rigid rods 19 attached to the top of the burner supports the motor blower compressor unit. Attached to this rod is a cup-shaped member 22 by which are supported the resilient members 23 which in turn support the reversed cup-shaped member 24 and the member 25, the member 25 in turn supporting the blower compressor unit 11. Vibrations which result from operation of the burner unit are absorbed by the resilient members 23. This prevents noise vibrations from being transmitted to the exterior of the casing through the support and body of the furnace upon which the compressor unit is mounted.

The operation of the motor blower compressor unit sucks in air through the tubular member 14 and the blower 15 then discharges it through the conduits 16 and 17 to the interior of the oil burner. The casing 20 which surrounds the unit acts as a reservoir analogous to an electric circuit having capacity and the member 14 as an inductance. The air going through the long pipe has inertia similar to the stored energy in an inductance. This prevents sound waves from issuing from the casing 20 through the pipe 14 to the exterior of the casing. Thus the combination of the casing and the intake tube 14 have the characteristics of what might be termed a sonic filter, that is, a mechanism for filtering or preventing noise from issuing from the blower compressor unit to the exterior of the casing while the unit is in operation. In actual practice the noise has been practically eliminated, very little noise or vibration finding its way to the outside of the casing. It also has been found in actual practice that upon operation of the

electrically driven blower compressor unit 11 the air supplied to the furnace 10 is drawn from inside of the closed casing 20 which cooperates with the furnace to surround the unit 11 as well as all the piping connecting the unit with the boiler furnace. As a result the air pressure inside of casing 20 and over the top of furnace 10 is reduced slightly below the atmospheric pressure. The outside air thereby is sucked into the casing 20 through the long air supply pipe 14 which as shown in Fig. 1 extends downwardly near the floor upon which the boiler furnace 10 is set.

It also has been found in practice that with the interior of the casing 20 and the top of furnace 10 maintained at sub-atmospheric pressure as just described any leakage of oil fumes or vapors from the motor compressor unit 11 or from the piping interconnecting the unit 11 with the boiler furnace 10 are drawn from the interior of the casing 20 along with the air and discharged into the interior of the oil burner. This effectively prevents the escape of these undesirable fumes and vapors into the atmosphere around the boiler furnace.

Furthermore, it has been found in practice that the arrangement of the closed casing 20 around the unit 11 on top of furnace 10 with the long downwardly extending air inlet pipe 14 forms a trap for any fumes or vapors which may escape from the unit 11, the interconnecting piping with the boiler furnace, or from the top of the furnace itself even during the period when the electric motor driven compressor unit 11 is not operating. As soon as the unit is started operating, the trapped fumes and vapors are drawn along with the air inside of the casing 20 and discharged into the interior of the combustion chamber of the boiler furnace 10.

The embodiment of the invention illustrated and described herein has been selected for the purpose of clearly setting forth the principles involved. It will be apparent, however, that the invention is susceptible of being modified to meet the different conditions encountered in its use, and I, therefore, aim to cover by the appended claim all of the modifications within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

In combination, an oil furnace having an electric motor driven blower pump unit mounted upon the top thereof for supplying air and oil thereto, a casing mounted upon the top of said furnace and forming therewith a closed housing surrounding said unit with the blower intake opening into the interior of said housing to reduce the pressure therein below atmospheric and exhaust oil vapors and fumes therefrom, and an inlet for said casing comprising a tubular air duct of restricted cross section extending downwardly from said casing and opening adjacent the base of said furnace whereby air is admitted to the casing and the operating noise of said unit is substantially suppressed.

ALEXANDER R. STEVENSON, JR.