

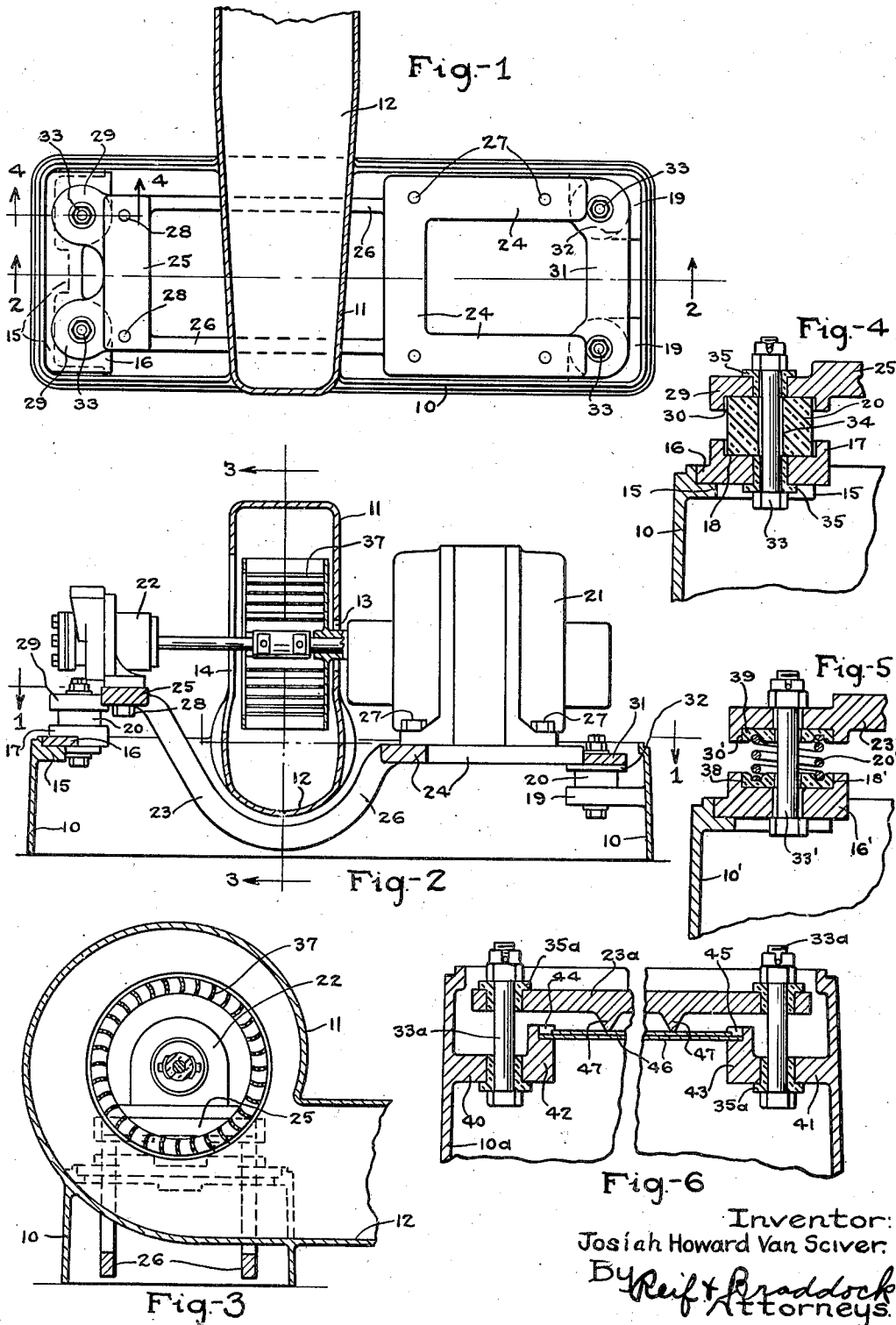
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SILENT MOUNTING FOR OIL BURNERS

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SILENT MOUNTING FOR OIL BURNERS

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6 Claims. (Cl. 103—218)

This invention relates to an oil burner, and has more especial reference to an oil burner of the type including a motor, and a fan and pump driven by said motor.

5 The general object of the invention is to provide an oil burner having means silently and non-resoundingly mounting the motor for said burner, as well as silently and non-resoundingly mounting a pump and/or a fan driven by said motor.

10 It has been found in practice that the motors of oil burners, especially high speed motors, when rigidly mounted upon the frames or housings of said oil burners, as heretofore has been the practice, cause objectionable noises to reverberate in the rooms of the residences or buildings in which the oil burners are installed. This is true even though an oil burner is quite quiet in the basement or other enclosure. The vibrations of a motor and the parts, such as pump and fan, driven thereby, are augmented by the air passing through the air conduit of the oil burner and into the furnace, and seem to come into resonance with radiators, beds, other furniture or fixtures, etc., causing a loud hum or roar at quite a distance from an oil burner. The present invention eliminates this objectionable effect by providing a support for the motor, and desirably the pump and fan, of an oil burner which is principally separate from the relatively rigid frame or housing of said oil burner and is resiliently and non-resoundingly carried thereby.

A further object of the invention is, therefore, to provide an oil burner including a frame or housing relatively rigidly supporting, as heretofore, the fan casing, air conduit, and additional elements of said oil burner, but resiliently and non-resoundingly supporting the motor, the fan and the pump of said burner, whereby to damp vibrations of the moving parts of the oil burner and thus eliminate the occurrence of objectionable noises in the rooms served by said oil burner.

A further object is to provide an oil burner including a motor and a member, such as a pump or fan, driven by said motor, and a bed for said motor and the member driven thereby resiliently mounted upon the oil burner frame or housing.

A further object is to provide an oil burner including a motor, a fan and pump driven by said motor, and means resiliently and non-resoundingly mounting said motor, fan and pump upon the relatively rigidly supported frame or housing of said oil burner.

55 A further object is to provide an oil burner

including a fan casing with air inlet, an air conduit leading from said fan casing, a motor at one side of said fan casing, a pump at the opposite side of said fan casing, the motor shaft freely passing through said fan casing and drivingly connected to said pump, a fan fixed to said motor shaft and arranged in said fan casing, and means resiliently mounting said motor and said pump upon the frame or housing of said oil burner.

And a still further object is to provide an oil burner including a frame or housing rigidly supporting a fan casing with air inlet and an air conduit leading from said casing and situated therebeneath, a motor at one side of said fan casing and adjacent thereto, a pump at the opposite side of and adjacent said fan casing, the motor shaft freely passing through said fan casing at the air inlet thereof and connected to said pump to drive the same, a fan fixed to said motor shaft and situated in said fan casing to force air into said air conduit, a bed for said motor and pump including substantially horizontal portions at opposite sides of said air conduit and supporting said motor and said pump, respectively, said bed including an intermediate, downwardly curved portion extending about the lower surface of said air conduit in spaced relation thereto, and means resiliently supporting said substantially horizontal portions of said bed upon the frame or housing of the oil burner, whereby to damp the vibrations of said motor, fan and pump.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawing, in which like reference characters refer to similar parts throughout the several views, and in which:

Fig. 1 is a sectional plan view of so much of an oil burner as is necessary to illustrate the features of the invention, taken as on line 1—1 in Fig. 2;

Fig. 2 is a vertical, central sectional view showing the motor and pump in elevation, taken as on line 2—2 in Fig. 1;

Fig. 3 is a transverse sectional view, taken as on line 3—3 in Fig. 2;

Fig. 4 is a detail sectional view, taken on line 4—4 in Fig. 1;

Fig. 5 is a detail sectional view corresponding generally with Fig. 4, but showing a modified type of resilient mounting for the bed which supports the motor and the pump; and

Fig. 6 is a transverse sectional view detailing

another modified type of resilient mounting for said motor and pump supporting bed.

In said drawing there is illustrated an oil burner of the type commonly known as the "gun-type", in which the oil is projected from a nozzle located at the outlet on an air conduit through which air is forced by a fan.

A frame or housing member for the oil burner is denoted as 10, and said frame or housing member is rigidly supported from the floor or ground in any convenient manner (not shown). Said frame or housing member 10 is, in the embodiment disclosed, made as an integral casting, said casting includes a fan casing 11 of substantially cylindrical form having an air conduit 12 extending substantially tangentially from its bottom side. The frame or housing 10 has the general form of a box or shell as shown.

The fan casing 11 has axial openings at either side thereof, including the smaller opening 13 and the opposite larger opening 14 which forms the air intake of the fan casing, as best shown in Fig. 2.

A flange 15 extends transversely of one end of the frame or housing 10 at the inner side thereof, and supports a shelf or table 16 which is also arranged cross-wise of said frame or housing, and is desirably flush at location adjacent its midlength with the upper surface of the frame or housing. The shelf or table 16 may be attached to the flange 15 in any suitable way. Each opposite end portion of said shelf or table 16 includes an upwardly extending abutment or portion 17 having a desirably cylindrical pocket 18 in its upper surface, as shown more clearly in Fig. 4. The base of each pocket 18 is preferably flat and disposed in a horizontal plane.

A corner flange 19 is provided at each of the opposite corners of the frame or housing 10, at the inner side of said frame or housing, as best shown in Figs. 1 and 2, and each corner flange 19 includes a desirably cylindrical pocket in its upper surface, precisely like the pocket 18 shown in Fig. 4 and for the same purpose.

Each of said pockets 18 is adapted to receive a resilient member, which, as shown in Figs. 2 and 4, is a block or piece of rubber, or other suitable resilient material, 20.

A supporting bed for the motor 21 and the oil pump 22 of the oil burner is designated at 23. Said bed 23 includes a motor supporting portion 24 at one side of the fan casing 11 and the air conduit 12, and an oil pump supporting portion 25 at the opposite side of said fan casing and air conduit, there being a downwardly curved portion 26 between said portions 24 and 25 extending about the lower surface of said air conduit in spaced relation thereto. As disclosed, the motor supporting portion 24 includes parallel spaced apart members extending longitudinally of the frame or housing 10, and a cross member at the inner ends of said parallel members integral therewith and also integral with the downwardly curved portion 26. The oil pump supporting portion 25 consists of a member which extends transversely of said frame or housing and also integral with the downwardly curved portion 26. Said downwardly curved portion 26 consists of spaced apart elements which extend longitudinally of the frame or housing 10 and join with the opposite end portions of said transverse members of the bed. The bed 23 as a whole is of substantial construction to firmly support the motor 21 and the oil pump 22, said motor being bolted down to said bed as indicated at 27, and said oil

pump being bolted down to said bed as indicated at 28.

The outer side of each end portion of the transverse member 25 of the bed constituting the oil pump support merges into a web 29, and each of said webs 29 includes a pocket 30 in its lower surface which fits down over a corresponding block or piece of rubber, or other resilient material, 20, as shown more clearly in Fig. 4.

The outer ends of the parallel members of the motor supporting portion 24 of the bed merge into and integrally support a transversely disposed plate 31 of the bed. Said plate 31 includes a downwardly extending abutment or portion 32 adjacent each end thereof, and each abutment or portion 32 is provided with a pocket similar to the pockets 30 and adapted to fit down over a corresponding block or piece of rubber, or other resilient material, 20, about as suggested in Fig. 4.

The four corners of the bed 23 are desirably bolted down to the shelves, including the shelf 16 and the shelves 19, by means of headed and nutted bolts 33, including one headed and nutted bolt at each corner portion of the frame or housing 10, as best disclosed in Figs. 1 and 4. As there shown, the element 20 includes a vertical opening 34 therethrough of greater diameter than the bolt 33, freely receiving said bolt, and said bolt passes upwardly through the appropriate portion of the bed 23 and downwardly through the corresponding shelf 16 or 19. Non-metallic bushings 35 are inserted in the bed 23 and in the shelf about each bolt. Thus the metallic bolts are held or retained out of contact with both the metallic bed 23 and the metallic shelves 16 and 19. The purpose of the attachments of the bed to the frame or housing is merely to prevent disassembly of the parts in handling and shipment, and therefore, said attachments can be quite loosely made. That is to say, the nuts upon the several bolts need not be turned tightly home against the bushings 35.

It should be remarked that the resilient elements 20 are not of sufficient size to completely fill the pockets 18 and 30, but are freely received in said pockets so that said resilient elements can better adapt themselves to changes of shape which will occur with vibrations of the motor 21 and the other moving parts of the oil burner mounted upon the bed 23, as will be understood.

As will be seen, the motor 21 is disposed at one side of the fan casing 11 at the elevation thereof, while the oil pump 22 is disposed at the opposite side of said fan casing at the same elevation as said motor. The shaft 36 of said motor passes freely through the fan casing, centrally of the openings 13 and 14, and is suitably connected to the pump to drive the same. A suitable type of fan 37 is arranged in the fan casing 11 and is fixed to rotate with the motor shaft 36. It is the function of the fan 37 to force air to travel outwardly through the air conduit 12, and it is the function of the oil pump 22 to force oil into a pipe (not shown) associated with said air conduit, so that the oil and air eventually meet each other, in a manner not necessary to be set forth herein.

From the foregoing description, read in connection with the disclosure of the drawing, it will be apparent that the bed 23 which supports the motor 21, the oil pump 22, and the fan 37 has no metallic connection whatsoever with the frame or housing proper of the oil burner, and

particularly has no metallic connection with the fan casing 11 and the air conduit 12. Thus the possibility of objectionable noises being carried, either through the medium of the oil burner 5 frame or housing itself or the air conduit thereof, to rooms being served by the oil burner, is definitely eliminated. Instead, the provision of the support or bed for the motor, oil pump and fan which is resiliently and non-resoundingly 10 mounted upon the oil burner frame or housing, principally separate therefrom, insures effective damping and absorption of the vibrations of the moving parts of said oil burner by the resilient material, such as the rubber blocks or pieces 20, 15 or equivalent elements, which directly carry said support or bed.

When the motor 21 is in operation, the unit of the oil burner including the bed 23 and the elements supported thereby will, naturally, vibrate, responsively to the vibrations of said motor. In order that there will be no interference of the motor shaft 36 and the fan 37 with the fan casing 11 due to vibrations of said unit, there is provided a requisite amount of clearance 25 between said shaft 36 and the openings 13 and 14 of the fan casing through which it passes, as well as a requisite amount of clearance between said fan 37 and the walls of said fan casing, as best shown in Fig. 2. Also, the downwardly 30 curved portion or portions 26 of the bed 23 are arranged at sufficient distance from the air conduit 12 to preclude possibility of contact of these mentioned parts at any time during the operation of the oil burner, as will be clear from Figs. 2 and 3.

In Fig. 5 there is disclosed a modified type of resilient mounting for the bed 23 which supports the motor and the pump. As there shown, the parts are the same as before described, except that the pockets 18' and 30' in the shelf 16' and the bed 23', respectively, receive non-metallic washers, denoted as 38 and 39, respectively, a coil spring 20' is seated between said washers to resiliently support the bed upon the 45 frame or housing 10' of an oil burner, and a headed and nutted bolt 33' passes through the bed 23', the washer 39, the coil spring 20', in spaced relation to said coil spring, the washer 38, and the shelf 16', to hold the parts in assembled relation. It will be noted that in the present form of the invention, with the structure shown substantially duplicated at the several corners of the frame or housing 10', the bed 23' will be resiliently and non-resoundingly 50 mounted upon said frame or housing. As disclosed, there is clearance between the bolt 33' and the elements 23' and 16' through which said bolt passes. Evidently, non-metallic bushings such as 35 could be arranged in the bed and shelf openings about said bolt 33' to eliminate 60 from the mounting of Fig. 5 all contact of metal with metal.

In Fig. 6 there is detailed a second modified type of resilient mounting for the bed, denoted as 23a, for supporting the motor and pump of an oil burner. As there contemplated the frame or housing 10a of an oil burner carries a pair of oppositely disposed, inwardly extending flanges 40 and 41 adjacent each end thereof, the flanges 70 40 and 41 at one end only of said frame or housing being illustrated, and the flanges which are not disclosed being duplicates of those shown. The upturned inner ends, represented as 42 and 43, respectively, of said flanges 40 and 41 at 75 each end of the frame or housing are recessed

as at 44 and 45 to provide seats for the opposite end portions of one or a plurality of transversely extending, horizontal, resilient plates 46 for directly supporting said bed 23a through the instrumentality of integral, downwardly extending, spaced apart converging teats or lugs 47 80 which bear directly upon said plate or plates 46 at suitable and desirable spaced relation from the ends thereof. As disclosed, the bed 23a includes a pair of alining teats or lugs 47 adjacent each end thereof. The arrangement and number of the teats or lugs can of course be varied. In the present embodiment of the invention, the assembly of the bed 23a with the oil burner frame or housing 10a can be accomplished by headed and nutted bolts 33a at the four corners of said frame or housing, including a bolt 33a passing through each flange 40, 41 and through the bed 23, with non-metallic bushings 35a upon each bolt and in the bed 95 and corresponding flange, respectively, about as shown. The bolts 33a will of course be relatively loosely mounted in the bushings 35a, in order that the side portions of the bed 23a will be freely movable upwardly and downwardly 100 upon flexing of the plates 46 due to vibrations of the motor and the other moving parts of the oil burner.

It will be evident that the invention presents a silent mounting for the motor, fan and pump 105 of an oil burner which is of very simple and efficient construction, and well adapted to the purpose of damping and absorbing all of the vibrations created by the moving parts of said oil burner, to thus eliminate the transference 110 of said vibrations, and the objectionable noises produced thereby, to the rooms of a residence or building being served by said oil burner.

What I claim is:

1. An oil burner mechanism including a fan 115 casing with air inlet, an air conduit leading from said fan casing, a frame supporting said fan casing and air conduit, a motor at one side of said fan casing, a pump at the opposite side of said fan casing, a shaft driven by said motor and 120 freely passing through said fan casing and connected to said pump for driving the same, a fan fixed to said motor shaft and arranged in said fan casing, a member to which said motor and pump are rigidly secured, and means resiliently mounting said member upon said frame. 125

2. An oil burner mechanism including a fan casing with air inlet, an air conduit leading from said fan casing, a frame supporting said fan casing and air conduit, a motor at one side of said fan casing, a pump at the opposite side of said fan casing, a shaft driven by said motor and 130 freely passing through said fan casing and connected to said pump for driving the same, a fan fixed to said motor shaft and arranged in said fan casing, a member to which said motor and pump are rigidly secured, and blocks of resilient material at the opposite end portions of said member resiliently mounting the same upon said frame. 140

3. An oil burner mechanism including a frame rigidly supporting a fan casing with air inlet and an air conduit leading from said casing and situated therebeneath, a motor at one side of said fan casing and adjacent thereto, a pump at the 145 opposite side of and adjacent said fan casing, a shaft driven by said motor and freely passing through said fan casing at the air inlet thereof and connected to said pump to drive the same, a fan fixed to said motor shaft and situated in 150

said fan casing to force air into said air conduit, a bed for said motor and pump including substantially horizontal portions at opposite sides of said air conduit and supporting said motor and pump, respectively, said bed including an intermediate, downwardly curved portion extending about the lower surface of said air conduit in spaced relation thereto, and means resiliently supporting said substantially horizontal portions of said bed upon said frame.

4. An oil burner mechanism having in combination, a frame having a fan casing supported thereon, a motor disposed at one side of said casing having a shaft extending through said casing, a fan disposed in said casing secured to said shaft, a pump disposed at the opposite side of said casing to which said shaft extends for driving said pump, a member to which said motor and pump are rigidly secured, said fan being supported upon said shaft, means connecting said member to said frame, and resilient means supporting said member upon said frame.

5. An oil burner mechanism having in combination,

a frame having a fan casing supported thereon, a motor at one side of said frame, a fan disposed in said casing driven by said motor, a pump at the opposite side of said casing driven by said motor, a member carrying said pump and motor and extending beneath said fan casing, and means resiliently mounting said member upon said frame.

6. An oil burner structure having in combination, a frame having a fan casing supported thereon and having supporting surfaces at each side of said casing above the bottom of said fan casing and above the bottom of said frame, a motor at one side of said casing having a shaft extending through said casing, a fan carried on said shaft and disposed in said casing, a pump at the opposite side of said casing driven by said shaft, a member to which said pump and motor are rigidly secured extending beneath said casing and means resiliently mounting said member upon said supporting surfaces.

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