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RESILIENT MOTOR SUPPORT

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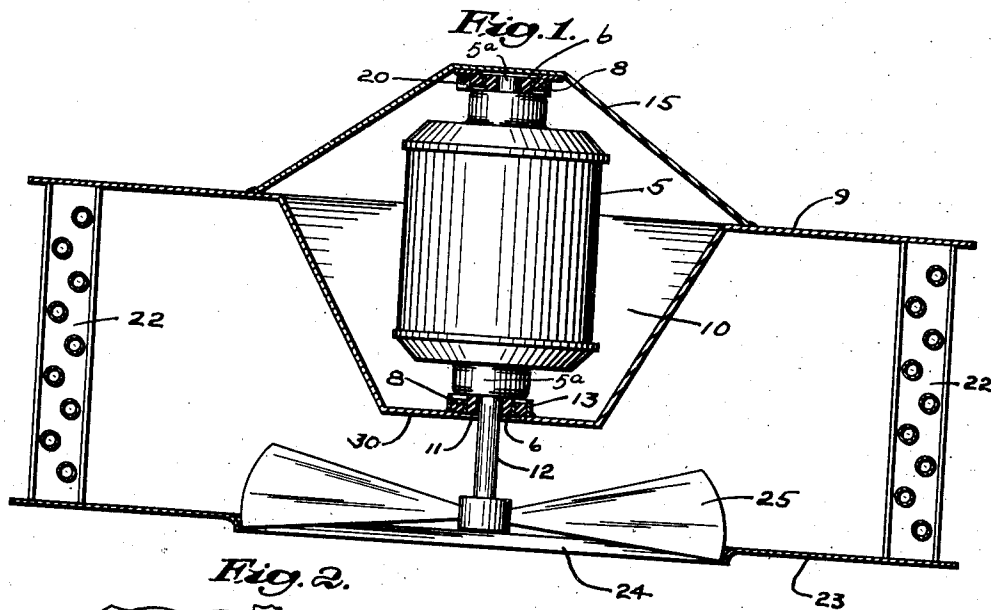


Fig. 2.

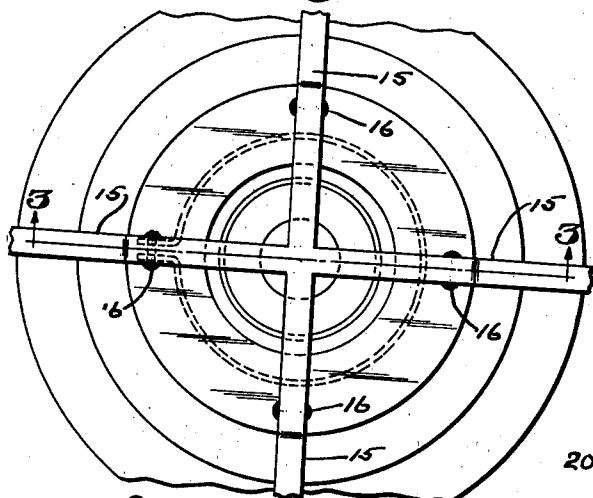


Fig. 3.

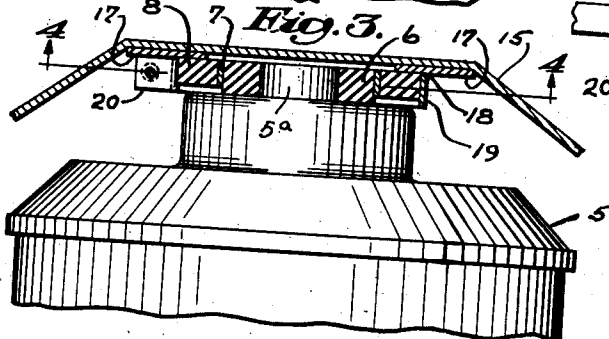
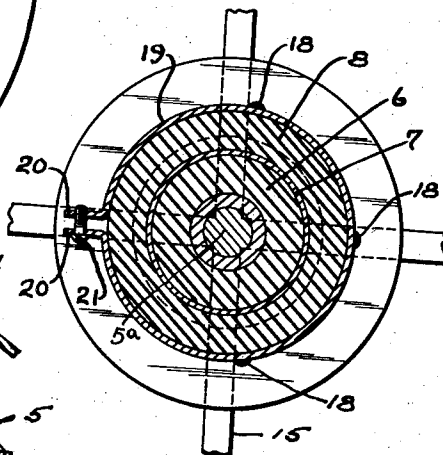


Fig. 4.



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RESILIENT MOTOR SUPPORT

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6 Claims. (Cl. 248—26)

This invention relates to resilient motor supports and relates more particularly to flexible supports for the fan motors of projection type heat exchangers.

Projection type heaters usually consist of annular radiators with centrally mounted fan motors which drive propeller fans to draw air through the radiator and discharge it downwardly into the space to be served.

This invention has as its object the absorption of starting shocks and the vibrations resulting from operation of the fan motors of projection type heat exchangers, and this is accomplished by providing simple, efficient, flexible, resilient supports for the fan motors.

The invention will now be described with reference to the drawing, of which:

Fig. 1 is a side elevation in section of a heat exchanger embodying this invention;

Fig. 2 is a plan view, reduced in size, looking downwardly upon the heat exchanger of Fig. 1;

Fig. 3 is a sectional view along the lines 3—3 of Fig. 2, and

Fig. 4 is a sectional view along the lines 4—4 of Fig. 3.

The upper and lower ends of the motor 5 have fitted thereon similar rubber supports, each consisting of a central, inner annular, rubber member 6 vulcanized to the motor housing, a cylindrical metal ring 7 surrounding and vulcanized to the member 6, and an outer annular, rubber member 8 vulcanized to the ring 7. At the upper end of the motor, the upper member 6 is vulcanized to and around the relatively small trunnion 5a. At the lower end of the motor, the lower member 6 has its upper surface vulcanized to the flat lower surface of the relatively large trunnion 5b.

The upper cover plate 9 for the annular radiator 22 is shaped to form a cone shaped central space 10 for receiving the motor 5, and has a lower horizontal wall 30 with a central opening 11 for receiving the motor shaft 12.

The lower ring 20 has a central opening 21. The cylindrical plate 13 is welded to the upper side of the wall 30, around the opening 10, and forms a cup for receiving the lower of the rubber motor mountings. The annular, inner member 6 of the lower support has its upper face vulcanized to the lower face of the trunnion 5b of the housing of motor 5 and fits loosely around the shaft 12 and extends above the opening 11. The outer rubber member 8 rests upon the inner portion of the wall 30, around the opening 11, and

fits snugly against the vertical sides of the ring 13.

The weight of the motor is transmitted through the lower rubber member 6, through the ring 7 to the lower rubber member 8 and through the latter to the lower wall 30 of the plate 9. The lower rubber members 6 and 8 are seen to be placed under both compression and shear, this providing a resilient yet sturdy support for the weight of the motor which prevents vibrations resulting from operation of the motor from being transmitted through the plate 9 to the air.

The four metal straps 15 are welded at their outer ends to the plate 9 and extend upwardly, and three of the four straps are welded at 16, on their lower sides, to the annular plate 17 which in turn is welded at 18 to the clamping band 19. The band 19 has the extensions 20 into which is screwed the machine screw 21.

The clamping band 19 fits around the outer rubber member 8 of the upper motor support, and the screw 21 is adjusted to cause the band 19 to clamp the upper member 8 tightly.

The lower face of the upper, inner member 6, as previously referred to, is vulcanized to the trunnion 5a of the housing of the motor, and the tendency of the motor housing to rotate in a direction opposite to that of its armature is overcome gradually and without shock and noise by absorption of the turning moment in the inner member 6 and the outer member 8, the inner member 6 tending to rotate with the motor housing, and the outer member 8 being held against rotation by the arms 15 attached to the plate 9.

The lower support serves chiefly to position the lower end of, and resiliently to support the weight of, the motor assembly for preventing noise through vibrations so that it is not necessary to use a lower adjustable, clamping band such as is used with the upper support.

The upper support serves also to absorb vibrations which might cause noise and serves, additionally to position the upper end of the motor and to absorb its turning moments.

The upper and lower supports together provide a simple, inexpensive and highly effective mounting for the fan motors of heat exchangers.

While one embodiment has been described for the purpose of illustration, it should be understood that the invention is not limited to the exact arrangement illustrated as modifications thereof may be suggested by those skilled in the art without departure from the essence of the invention.

What is claimed is:

1. A resilient mounting for supporting a motor with a vertical shaft from a unit, said motor having a relatively small upper trunnion, and a relatively large lower trunnion around said shaft, comprising an upper and a lower plate extending perpendicular to said shaft, upper and lower, annular, resilient members attached to said trunnions, said upper member extending around said small trunnion and having its inner surface attached to the outer surface thereof and said lower member having its upper surface attached to the lower surface of said large trunnion, a cylindrical ring attached to the upper side of said lower plate and enclosing the lower of said members, said lower member and said lower plate having central openings for the reception of said shaft, the weight of said motor being supported through said lower member on said lower plate, an annular clamp attached to the lower side of said upper plate and clamped around said upper member, means for adjusting said clamp for varying its clamping effect, and means supporting said upper and lower plates from said unit.

2. A resilient mounting for supporting a motor with a vertical shaft from a unit, said motor having a relatively small upper trunnion, and a relatively large lower trunnion around said shaft, comprising an upper and a lower plate extending perpendicular to said shaft, upper and lower, annular, resilient members vulcanized to said trunnions, said upper member extending around said small trunnion and having its inner surface vulcanized to the outer surface thereof and said lower member having its upper surface vulcanized to the lower surface of said large trunnion, a cylindrical ring attached to the upper side of said lower plate and enclosing the lower of said members, said lower member and said lower plate having central openings for the reception of said shaft, the weight of said motor being supported through said lower member on said lower plate, an annular clamp attached to the lower side of said upper plate and clamped around said upper member, said unit having a cover plate forming a cone shaped space around said motor with said lower plate forming the frustrum thereof as an extension of said cover plate, and means supporting said upper plate from said cover plate.

3. A resilient mounting for supporting a motor with a vertical shaft from a unit, said motor having a relatively small upper trunnion, and a relatively large lower trunnion around said shaft, comprising an upper and a lower plate extending perpendicular to said shaft, upper and lower, annular, resilient members attached to said trunnions, said upper member extending around said small trunnion and having its inner surface attached to the outer surface thereof and said lower member having its upper surface attached to the lower surface of said large trunnion, a cylindrical ring attached to the upper side of said lower plate and enclosing the lower of said members, said lower member and said lower plate having central openings for the reception of said shaft, the weight of said motor being supported through said lower member on said lower plate, an annular clamp attached to the lower side of said upper plate and clamped around said upper member, said unit having a cover plate forming a cone shaped space around said motor with said lower plate forming the

frustrum thereof as an extension of said cover plate, and means including a plurality of metal straps for supporting said upper plate from said cover plate.

4. A resilient mounting for supporting a motor with a vertical shaft from a unit, said motor having a relatively small upper trunnion, and a relatively large lower trunnion around said shaft, comprising an upper and a lower plate extending perpendicular to said shaft, upper and lower, annular, resilient members attached to said trunnions, said upper member extending around said small trunnion and having its inner surface attached to the outer surface thereof and said lower member having its upper surface attached to the lower surface of said large trunnion, a cylindrical ring attached to the upper side of said lower plate and enclosing the lower of said members, said lower member and said lower plate having central openings for the reception of said shaft, the weight of said motor being supported through said lower member on said lower plate, the opening in said lower plate being substantially larger than the opening in said lower member whereby the inner portion of said lower member is under shear from the weight of said motor, an annular clamp attached to the lower side of said upper plate and clamped around said upper member, and means supporting said upper and lower plates from said unit.

5. A resilient mounting for supporting a motor with a vertical shaft from a unit, said motor having a relatively small upper trunnion, and a relatively large lower trunnion around said shaft, comprising an upper and a lower plate extending perpendicular to said shaft, upper and lower, annular, resilient members vulcanized to said trunnions, said upper member extending around said small trunnion and having its inner surface vulcanized to the outer surface thereof and said lower member having its upper surface vulcanized to the lower surface of said large trunnion, a cylindrical ring attached to the upper side of said lower plate and enclosing the lower of said members, said lower member and said lower plate having central openings for the reception of said shaft, the weight of said motor being supported through said lower member on said lower plate, the opening in said lower plate being substantially larger than the opening in said lower member whereby the inner portion of said lower member is under shear from the weight of said motor, an annular clamp attached to the lower side of said upper plate and clamped around said upper member, said unit having a cover plate forming a cone shaped space around said motor with said lower plate forming the frustrum thereof as an extension of said cover plate, and means supporting said upper plate from said cover plate.

6. A resilient mounting for supporting a motor with a vertical shaft from a unit, said motor having a relatively small upper trunnion, and a relatively large lower trunnion around said shaft, comprising an upper and a lower plate extending perpendicular to said shaft, upper and lower, annular, resilient members attached to said trunnions, said upper member extending around said small trunnion and having its inner surface attached to the outer surface thereof and said lower member having its upper surface attached to the lower surface of said large trunnion, a cylindrical ring attached to the upper side of said lower plate and enclosing the lower

of said members, said lower member and said lower plate having central openings for the reception of said shaft, the weight of said motor being supported through said lower member on said lower plate, the opening in said lower plate being substantially larger than the opening in said lower member whereby the inner portion of said lower member is under shear from the weight of said motor, an annular clamp at-

tached to the lower side of said upper plate and clamped around said upper member, said unit having a cover plate forming a cone shaped space around said motor with said lower plate forming the frustrum thereof as an extension of said cover plate, and means including a plurality of metal straps for supporting said upper plate from said cover plate.

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