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REFRIGERATING APPARATUS
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2,117,919

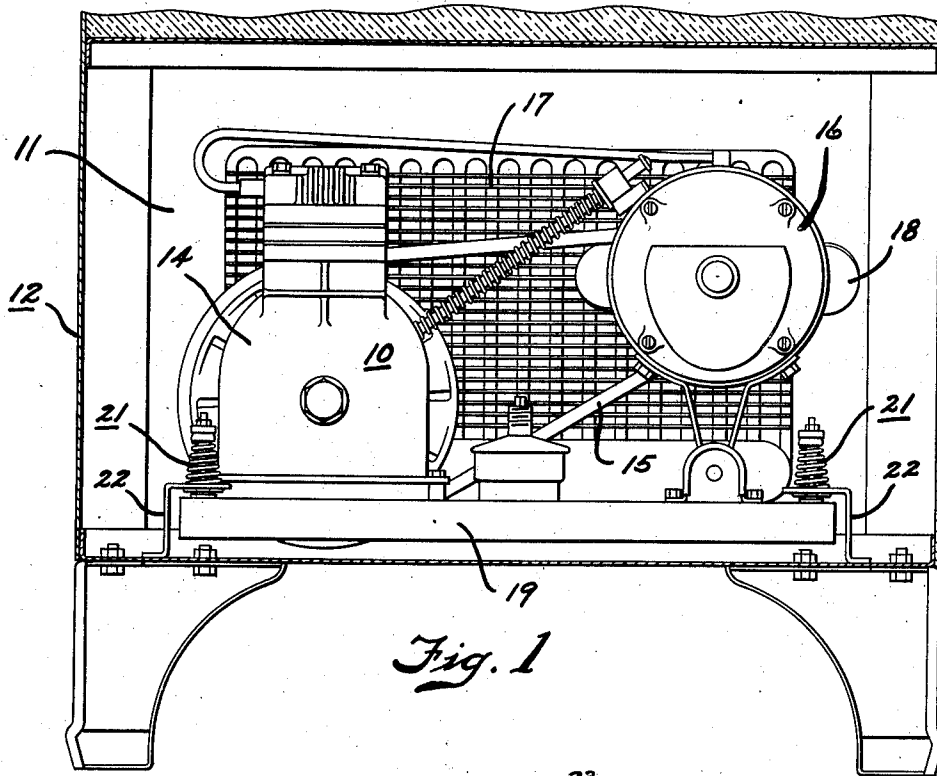


Fig. 1

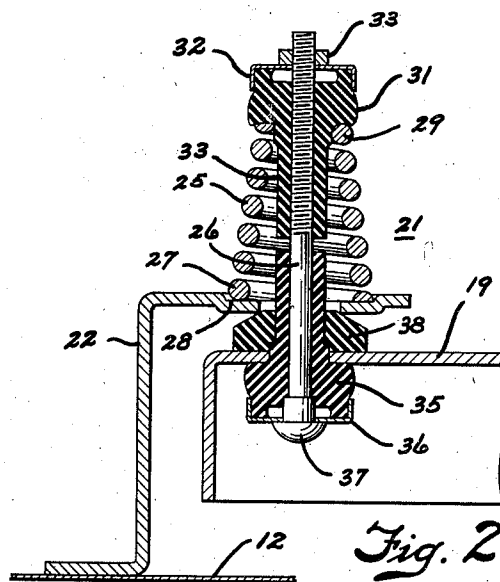


Fig. 2

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REFRIGERATING APPARATUS

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1 Claim. (Cl. 248—18)

This invention relates to refrigerating apparatus and more particularly to a mounting for the refrigerating machine.

In the past it has been customary to employ straight sided helical springs, that is, springs of helicoid form and of the same diameter throughout their extension. In a spring mounting arrangement or device for refrigerating machinery such, for example, as the mounting or suspension of a motor-compressor unit of a refrigerating system in a refrigerator cabinet such springs have been found to give under the weight of the unit and to lean to one side a sufficient distance to permit the supporting rods associated with such devices to touch the springs and thus create a noise or transmit noise created by the unit and noises of vibration thereof through the spring to the member adapted to support the unit. Occasionally, the so-called straight sided springs are moved or jarred out of place, by moving the refrigerator cabinet from one locality to another, and into a position to touch the supporting rods to thus cause the transmission of noise as explained. Therefore, the use of helicoid springs of the same diameter at both ends thereof for spring mounting devices have not been entirely satisfactory and my invention is particularly directed to overcoming the objections enumerated in the use of spring mounting devices.

An object of the present invention is to provide an improved resilient device for suspendingly mounting a motor-compressor unit of a refrigerating system from a support therefor.

Another object of the invention is to provide an improved resilient device for mounting a motor-compressor unit of a refrigerating system upon a support therefor which device has rubber members breaking any metallic contact between the unit and the support upon which it is mounted.

In carrying out the foregoing objects it is a further and more specific object of this invention to provide a spring suspension device for a motor-compressor unit of a refrigerating system which has springs of a character and formed or arranged to prevent side sway of the unit in order to keep the unit centralized relative to the support upon which the unit is mounted.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a fragmentary vertical sectional view through a refrigerator cabinet showing a motor-

compressor unit of a refrigerating system mounted in the machine compartment thereof; and

Fig. 2 is an enlarged vertical sectional view through one of the devices employed to suspendingly support the motor-compressor unit within the refrigerator cabinet.

Referring to the drawing, for illustrating the present invention, I have shown in Fig. 1 thereof a refrigerant liquefying and circulating unit of a refrigerating system generally represented by the reference character 10 mounted within the machine compartment 11 of refrigerator cabinet 12 which cabinet may be of any suitable or conventional construction. The unit 10 comprises a compressor 14 operatively connected, through suitable belt and pulley connections 15, with an electric motor 16. The compressor 14 is adapted to have a pipe or conduit connected with an evaporator (not shown) mounted within a food storage compartment provided in the cabinet 12. A compressor 14 withdraws gaseous refrigerant from the evaporator, compresses same, and forwards the compressed refrigerant under pressure into a condenser-receiver 17. The compressed refrigerant within the condenser-receiver 17 may be cooled in any suitable manner such as by air circulated thereover by a fan 18 mounted upon the shaft of motor 16. Condenser-receiver 17 is also adapted to have a pipe or conduit connected with the evaporator for conveying condensed liquefied refrigerant thereto. The motor 16 and compressor 14 are mounted in any suitable or desirable manner upon a base 19. The unit base 19 is of a rectangular form and is preferably supported upon the bottom wall of the machine compartment 11 of cabinet 12 by four suitable spring suspension devices generally represented by the reference character 21 and which will be more fully described hereinafter. One of the spring suspension devices 21 are located at each corner of the base 19 and is supported upon a bracket 22 secured to the bottom wall of machine compartment 11 in any suitable or desirable manner.

Referring now to Fig. 2 of the drawing it will be noted that each spring suspension device 21 generally comprises a helical spring 25 secured between the ends of a rigid member such as a rod or bolt 26. The spring 25 is of the type having the upper coils or turns thereof of smaller diameter than the lower turns thereof to form a substantially cone-shaped helicoid spring. The large end 27 of the cone-shaped helicoid spring abuts the mounting bracket 22 and fits within a depression 28 provided therein. The small end 29 of spring 25 engages a rubber bushing mem-

ber 31 surrounding the upper end portion of rod 26. A cup-shaped metal washer 32 lies over and fits on the top of bushing member 31 and is secured to the device 21 by a nut 33 threaded upon threads provided on rod 26. It will be noted that the bushing member 31 includes a collarlike portion 33 which extends downwardly from the head portion thereof within the coils of spring 25 to a point closely adjacent the lower end 27 of the spring. The rod 26 carries the unit 10 by protruding through an opening provided in the base 19 of the unit. Obviously the weight of unit 10 thereby compresses spring 25 between the upper end of rod 26 and the bracket 22. A resilient rubber bushing member 35, in the form of an exact duplicate of the bushing 31 but assembled in device 21 in a reverse position relative to bushing 31, surrounds the rod 26 and extends through the opening provided in the base 19 of unit 10 to a point above the bracket member 22. A cup-shaped metal washer 36, in the form of an exact duplicate of washer 32, fits under the head 37 of bolt or rod 26 and over the head portion of rubber bushing 35. There is a rubber washer or collar 38 fitting over the shank portion of bushing 35 and bearing against the top side of the metal base 19 of unit 10. Collar or washer 38 may be of a much softer rubber composition than the flexible bushings 31 or 35 so as to deaden any noises created by vibration of unit base 19 since the same touches or abuts the bracket 22 and provides a resilient connection between the bracket and the base. The soft resilient collar or washer 38 serves as a cushion between base 19 and bracket 22 and tends to prevent movement of the base relative to the bracket.

It has been found that the particular shape of the spring 25 in device 21 as disclosed prevents side sway of unit 10 within cabinet 12 and that the spring 25 tends to at all times maintain the unit 10, mounted upon base 19, centralized relative to the mounting bracket 22. Thus abnormal movement of unit 10 ordinarily created by the initial starting operation of the motor 16 and compressor 14 of unit 10 is prevented by the improved device 21 from causing the unit 10 to get out of its normal position within the machine compartment 11 of cabinet 12. The device 21 prevents engagement of the suspension springs 25 with the rods or bolts 26 upon abnormal side sway of the unit 10 and noise ordinarily caused by such side sway in conventional suspension devices are eliminated by the improved devices disclosed. It will be noted that the rubber bushing members 31 and 35 of the device 21 break the metal to metal contact between the unit base 19 and the springs

25 or brackets 22 to thus prevent transmission of noises created by operation of the motor and compressor of unit 10 to the walls of the refrigerator cabinet 12. The device 21 while serving to prevent transmission of noises and to prevent side sway of unit 10 are also of such construction as to prevent abnormal hopping or jumping of the unit 10 within the machine compartment of the refrigerator cabinet.

From the foregoing it will be seen that I have provided an improved spring suspension mounting for a refrigerant liquefying and circulating unit of a refrigerating system within a refrigerator cabinet which, due to certain parts thereof being duplicates or being identical in configuration and formed by being moulded in or punched from the same die, can be manufactured at low cost thus reducing to a minimum the final cost of the apparatus. The improved spring suspension mounting devices are efficient and practical in use and overcome certain difficulties heretofore enumerated in the construction and use of spring mounting devices heretofore employed for the purpose herein described.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claim which follows.

What is claimed is as follows:

A supporting structure for suspendingly supporting a unit adapted to be operated and which unit creates vibrations during operation thereof comprising in combination, a plurality of suspension devices interposed between the unit and a member adapted to support same, each of said devices comprising a rigid member extending upwardly from and carrying said unit, a sound deadening element interposed between the unit and its point of engagement with said rigid member, a spring interposed between said rigid member and the member adapted to support the unit, said spring engaging said unit support member and extending upwardly therefrom around said rigid member, a sound deadening element interposed between the spring and its point of attachment to said rigid member, said spring being of a helicoid form and being of greater diameter at one end than at the other end thereof, said spring being positioned in said device with its greater diametered end bearing against the member adapted to support the unit for preventing lateral movement of the unit relative to its supporting member, and said second named sound deadening element preventing said spring from creating noises during vibration thereof.

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