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COMPRESSOR MOUNTING STRUCTURE FOR USE IN AIR
CONDITIONER APPARATUS
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3,198,324

Fig. 1.

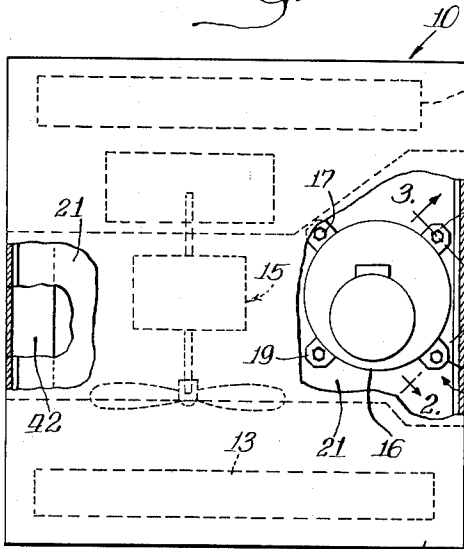


Fig. 2.

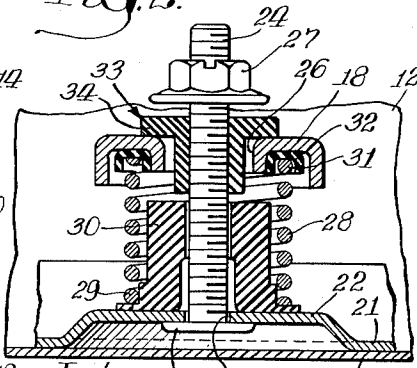


Fig. 3.

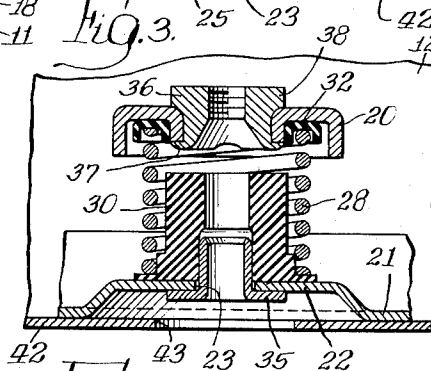


Fig. 4.

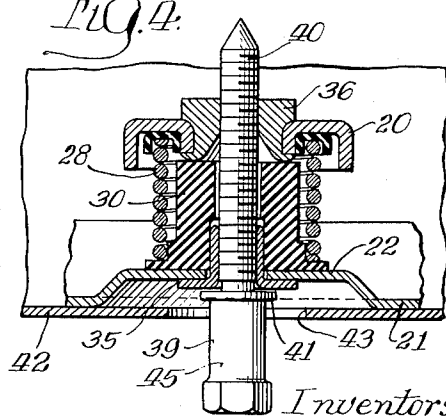
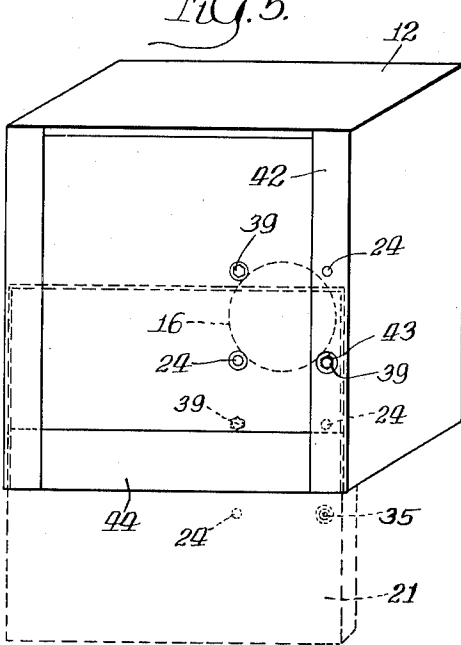


Fig. 5.



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COMPRESSOR MOUNTING STRUCTURE FOR USE IN AIR CONDITIONER APPARATUS

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11 Claims. (Cl. 206—46)

This invention relates to air conditioning apparatus, and in particular, to means for securing the compressor in such apparatus.

In one common form of room air conditioner, the operating mechanism thereof is carried on a chassis removably associated with an outer cabinet or housing. Normally, the air conditioner is installed in a window opening or the like by firstly removing the chassis from the cabinet and assembling the cabinet in the window opening. The chassis is then reinstalled in the cabinet to complete the installation.

One of the elements of the conventional air conditioning apparatus comprises a motor-compressor. It is desirable, to effectively minimize vibration and noise and to increase the life of the apparatus, to mount the motor-compressor resiliently on the chassis. However, during shipment of the air conditioner, as from the manufacturer, it is desirable to secure the compressor fixedly to the chassis to preclude damage and deformation to the cabinet and to the tubing, which connects the compressor to the other refrigeration components.

One method of solving this problem has been to provide a locking means which rigidly secures the compressor to the chassis during shipment and which may be removed or released by the person installing the air conditioner to permit the compressor to be resiliently mounted in the installation. A problem arises, however, with the known structures for effecting the rigid securing of the compressor, in that it has been found that quite often the person installing the air conditioner neglects to remove or release the conventional securing means, and, thus, the compressor is permitted to operate in rigid association with the chassis, thereby causing objectionable noise and vibration.

The present invention comprehends an improved means for securing the compressor in such air conditioning apparatus wherein means are provided for selectively rigidly securing the compressor to the chassis, which means are arranged to preclude installation of the air conditioner without firstly releasing the rigid securing means. Thus, a principal feature of the invention is the provision of air conditioning apparatus having new and improved compressor securing means.

Another feature of the invention is the provision of such apparatus wherein the compressor securing means is arranged to preclude installation of the air conditioner without firstly releasing the rigid securing means to insure a resilient mounting of the compressor in the installation.

A further feature of the invention is the provision of such apparatus wherein the compressor mounting means includes a resilient element resiliently mounting the compressor to the chassis, means releasably rigidly securing the compressor to the chassis, and means precluding removal of the chassis from the cabinet until the rigid securing means is released.

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

FIGURE 1 is a plan view of an air conditioner including a compressor secured to the chassis by means embodying the invention;

FIGURE 2 is an enlarged fragmentary vertical sec-

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tion taken substantially along the line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged fragmentary vertical section taken substantially along the line 3—3 of FIGURE 1;

FIGURE 4 is a view generally similar to that of FIGURE 3, but further illustrating the bolt for rigidly securing the compressor to the chassis; and

FIGURE 5 is a bottom perspective view of the air conditioner cabinet, with the chassis in a partially removed position shown in dotted lines.

In the exemplary embodiment of the invention as disclosed in the drawing, an air conditioner generally designated 10 is shown to include a chassis 11 removably installed in an outer cabinet or housing 12. The air conditioner is generally of conventional construction including a condenser 13, an evaporator 14 and fan apparatus 15. The air conditioner further includes a generally conventional motor-compressor 16 which, as best seen in FIGURE 1, is provided with four circumferentially 90 degree spaced mounting legs 17, 18, 19 and 20. The invention herein is concerned with the means provided for cooperation with legs 17—20 to secure the motor-compressor 16 to the base pan 21 of the chassis 11. The invention comprehends the provision of such means arranged to preclude the removal of the chassis 11 from the cabinet 12 until such time as the motor-compressor securing means is arranged to provide a resilient mounting of the motor-compressor in the chassis 11.

More specifically, leg 18 is secured to the base pan 21, as illustrated in FIGURE 2. Leg 17 is identically secured to the base pan 21. As shown in FIGURE 2, base pan 21 is provided with a raised circular boss portion 22 provided with a central opening 23 through which extends a bolt 24 having its head 25 welded to the underside of the boss 22 surrounding the opening 23. The bolt extends upwardly through a central opening 26 of the leg 18. The leg 18 is axially movably retained in association with bolt 24 by means of a lock nut 27 threaded to the distal end of the bolt. A coil spring 28 coaxially surrounds the lower end of the bolt and has its lower end 29 seated on a rubber grommet 30 concentrically within the spring and surrounding the bolt. The upper end 31 of the spring is seated in a rubber washer 32 engaging the underside of the leg 18 and defining an annular member having a downwardly opening concave section. A second rubber grommet 33 is disposed on bolt 24 subjacent lock nut 27 and includes a radially enlarged upper flange portion 34 overlying the leg 18.

The lock nut 27 is adjusted on the bolt 24 to be spaced approximately one-eighth inch from the upper portion 34 of grommet 33, thereby permitting free axial adjustment of the leg 18 within the limited range thusly permitted.

Turning now to FIGURE 3, the means for securing motor-compressor leg 20 to the base pan 21 is modified somewhat from the means for securing the legs 17 and 18 thereto. Leg 19 is secured to the base pan 21 in the same manner as is leg 20. More specifically, leg 20 is secured to the raised boss 22 by the securing means including a coil spring 28, rubber grommet 30 and rubber washer 32. However, in lieu of bolt 24, a metal thimble 35 is welded to the underside of the boss 22 to extend through opening 23 part-way axially through the grommet 30. An internally threaded annular steel insert 36 is secured to the leg 20 by means of a staked flange 37 and an upper out-turned flange portion 38.

As seen in FIGURE 4, the coil spring 28 resiliently urges the leg 20 upwardly from the grommet 30. During shipment of the apparatus 10, however, it is desirable to substantially rigidly retain the leg 20 (and similarly mounted leg 19), and for this purpose, a shoulder bolt

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39 is provided having an upper threaded portion 40 threadedly engaging the steel insert 36, and a lower shoulder portion 41 rotatably slidably engaging the thimble 35. Thus, as the bolt 39 is threaded into insert 36, the insert is drawn downwardly toward boss 22 carrying with it the leg 20 until the insert 36 seats on grommet 30, as shown in FIGURE 4. At this time, the spring 28 is compressed so as to have the turns thereof in engagement with one another, thereby substantially rigidly mounting the motor-compressor 16 on the base pan 21.

Referring now to FIGURE 5, the cabinet 12 is shown to include a bottom side rail 42 having an opening 43 through which the bolt 39 extends. The cabinet further includes a cross rail 44 at the front thereof.

In assembling the air conditioning apparatus 10, the motor-compressor 16 is installed on the base pan 21 as shown in FIGURES 2 and 3. The chassis 11 including the motor-compressor is then installed in the cabinet 12 in the arrangement of FIGURE 1. The assembled chassis and cabinet are then positioned as shown in FIGURE 5 in full lines, and the bolts 39, one of which extends through opening 43, are threaded into the inserts 36 to rigidly secure each of legs 19 and 20 to the base pan 21, as shown in FIGURE 4. The downward extension of the head 45 of bolt 39 may be suitably accommodated in openings in the conventional skid (not shown) on which the air conditioner is then placed for shipment.

When the user installs the air conditioner, he must first remove the bolts 39 to permit withdrawal of chassis 11 from the cabinet 12 in order to install the cabinet in the window opening. If he does not so remove the bolts 39, the bolt associated with leg 20 prevents movement of the chassis relative to the rail 42 by virtue of its interference therewith in its opening 43, and the bolt 39 associated with leg 19 precludes withdrawal of the chassis by virtue of its interference with the rail 44. Once the bolts 39 are removed, however, the chassis may be removed in the conventional manner to permit the installation of the cabinet in the window opening.

Thus, the user is forced to remove the means rigidly mounting the motor-compressor on the base pan and permit the coil springs 28 to carry the motor-compressor resiliently on the base pan when the air conditioner is installed.

While we have shown and described one embodiment of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. In an air conditioner apparatus, an outer housing defining the normal enclosure of the apparatus when the apparatus is installed and requiring the installation of the housing alone as a first step in the installation of the apparatus, a chassis removably associated with the housing, and a compressor, structure for mounting the compressor on the chassis including means for resiliently mounting the compressor to the chassis in an operating arrangement of the apparatus, means for selectively overcoming the resilient mounting means and releasably rigidly securing the compressor to the chassis in a shipping arrangement of the apparatus, and means precluding removal of the chassis from the housing to prevent disposing the apparatus in the operating arrangement until said rigid securing means is released.

2. In an air conditioner apparatus, an outer housing defining the normal enclosure of the apparatus when the apparatus is installed and requiring the installation of the housing alone as a first step in the installation of the apparatus, a chassis removably associated with the housing, and a compressor, structure for mounting the compressor on the chassis including means including a resilient element for resiliently mounting the compressor to the chassis in an operating arrangement of the apparatus,

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means for releasably overcoming the resilient element for substantially rigidly securing the compressor to the chassis in a shipping arrangement of the apparatus, and means precluding removal of the chassis from the housing to prevent disposing the apparatus in the operating arrangement until said rigid securing means is released.

3. The air conditioner apparatus of claim 2 wherein said resilient element comprises a spring and said overcoming means comprises screw means urging the spring to a substantially fixed position against the bias thereof.

4. The air conditioner apparatus of claim 2 wherein said resilient element comprises a coil spring.

5. In an air conditioner apparatus, an outer housing defining the normal enclosure of the apparatus when the apparatus is installed and requiring the installation of the housing alone as a first step in the installation of the apparatus, a chassis removably associated with the housing, and a compressor, structure for mounting the compressor on the chassis including means including a resilient element for resiliently mounting the compressor to the chassis in an operating arrangement of the apparatus, means on said housing defining a stop, and means for releasably substantially rigidly securing the compressor to the chassis in a shipping arrangement of the apparatus, and having a portion arranged to engage said stop for precluding removal of the chassis from the housing to prevent disposing the apparatus in the operating arrangement until said rigid securing means is released.

6. The air conditioner apparatus of claim 5 wherein said rigid securing means includes a threaded member having a shoulder portion for engaging said stop.

7. Structure for mounting a compressor having a support portion, said structure being arranged to mount the compressor selectively rigidly as during shipment and resiliently as during use, said structure comprising: a base having an opening; a coil spring extending coaxially to said opening from one side of said base to subjacent the compressor support portion; a securing member having a threaded opening and a portion for engaging said support portion; a bolt extending removably through said base opening, coaxially through said coil spring, and into threaded engagement with said securing member to cause said support portion of the compressor to be resiliently carried on the spring and alternatively to draw said portion of the securing member toward the base sufficiently to compress said spring to have its turns engage each other and thereby substantially rigidly retain said securing member and support portion on said base.

8. The structure of claim 7 wherein said base is provided with a thimble defining said opening and extending substantially from said one side of the base.

9. Structure for mounting a compressor having a support portion, said structure being arranged to mount the compressor selectively rigidly as during shipment and resiliently as during use, said structure comprising: a base having an opening; a coil spring extending coaxially to said opening from adjacent one side of said base to subjacent the compressor support portion; a securing member having a threaded opening and a portion for engaging said support portion; an annular resilient member disposed between said spring and said base; a bolt extending removably through said base opening, coaxially through said resilient member and said coil spring, and into threaded engagement with said securing member to cause said support portion of the compressor to be resiliently carried on the spring and alternatively to draw said portion of the securing member toward the base sufficiently to compress said spring to have its turns engage each other and thereby substantially rigidly retain said securing member and support portion.

10. In an air conditioner apparatus, an outer housing defining the normal enclosure of the apparatus when the apparatus is installed and requiring the installation of the housing alone as a first step in the installation of the apparatus, a chassis removably associated with the hous-

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ing, and a compressor, structure for mounting the compressor on the chassis including first mounting means including a resilient element for resiliently mounting the compressor on the chassis in an operating arrangement of the apparatus, said mounting means including means for retaining the compressor juxtaposed to the chassis, second mounting means including means for releasably rigidly securing the compressor to the chassis in a shipping arrangement of the apparatus, and means precluding removal of the chassis from the housing to prevent disposing the apparatus in the operating arrangement until said rigid securing means is released.

11. In an air conditioner apparatus, an outer housing defining the normal enclosure of the apparatus when the apparatus is installed and requiring the installation of the housing alone as a first step in the installation of the apparatus, a chassis removably associated with the housing, and a compressor, structure for mounting the compressor on the chassis including a pair of first mounting means at opposite spaced portions of the compressor,

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each of said mounting means including a resilient element resiliently mounting the compressor on the chassis in an operating arrangement of the apparatus, and including means for retaining the compressor juxtaposed to the chassis, second mounting means releasably rigidly securing the compressor to the chassis in a shipping arrangement of the apparatus, and means precluding removal of the chassis from the housing to prevent disposing the apparatus in the operating arrangement until said rigid securing means are released.

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