

Jan. 8, 1929.

1,698,306

E. H. HULL

REFRIGERATING MACHINE

Filed Feb. 5, 1927

Fig. 1.

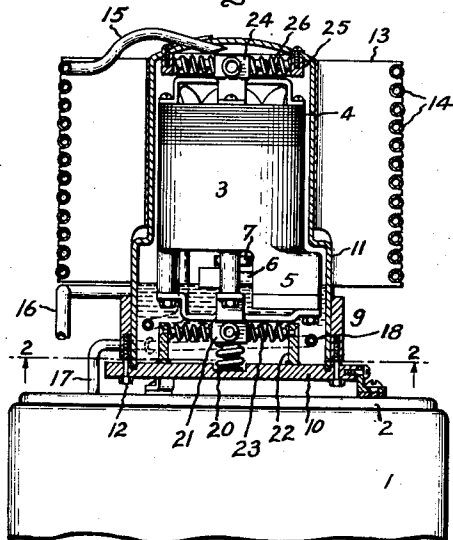


Fig. 2.

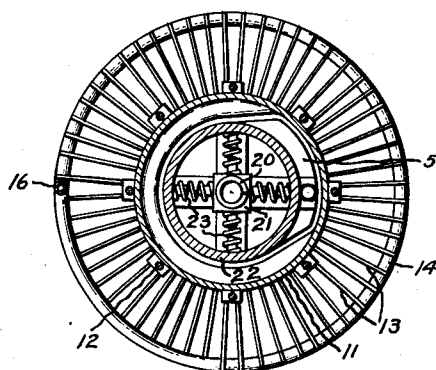


Fig. 3.

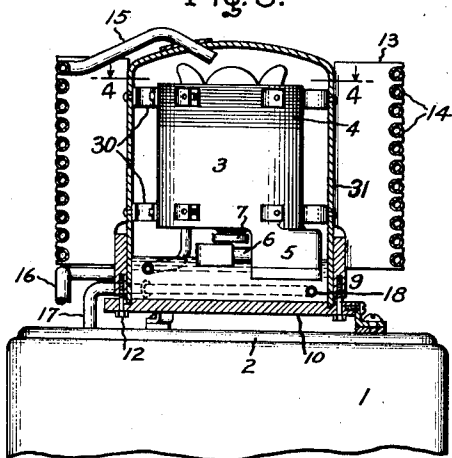
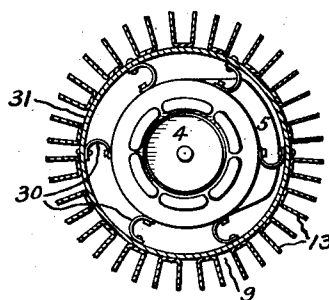


Fig. 4.



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UNITED STATES PATENT OFFICE.

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REFRIGERATING MACHINE.

Application filed February 5, 1927. Serial No. 166,220.

My invention relates to machines which when in operation are set into vibration by the rapid movement of their parts, and an object of my invention is to provide improved mounting means for such a machine whereby the amount of noise and vibration transmitted from the machine shall be reduced to a low or negligible value. My invention is particularly applicable to refrigerating machines of the motor driven domestic type since in these machines a most important desideratum is quiet operation. I have therefore chosen to disclose my invention as embodied in such a machine although it is to be understood that it is not limited to such. It is well known that noise and vibration from machines having rapidly moving parts may be largely reduced by a proper counterbalancing of the parts but in the commercial production of such machines, for example refrigerating machines for domestic use, there are limitations to which the counterbalancing can be carried economically. I have found that elaborate counterbalancing of the moving parts is unnecessary and that the objectionable noise and vibration may be almost entirely eliminated if the mechanism comprising the moving parts be enclosed by a gas tight casing, the mechanism being spaced at all points from the casing, and the mechanism be mounted in the casing by resilient, vibration-absorbing means.

My invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

Referring to the drawing, Fig. 1 is a vertical cross-sectional view illustrating a refrigerating machine, constituting one form of my invention; Fig. 2 is a transverse section thereof taken on the line 2-2; Fig. 3 is a view similar to Fig. 1 illustrating a modification; and Fig. 4 is a transverse section thereof taken on line 4-4.

In the drawing I have shown at 1 a refrigerator box which may be of any suitable construction within which is the evaporator or cooling element, not shown. The mechanism by which the refrigerant vaporized in the cooling element is compressed preparatory to being recondensed to the liquid form may be located either within the same enclosure as the box 1 or outside of the same.

In the drawing I have shown this mechanism arranged on the top of the box, being mounted on the cover 2. It comprises a frame 3 supporting the electric motor 4 and the compressor 5 directly connected therewith. The compressor illustrated is of the oscillating cylinder type, although compressors of other types may be used, the piston 6 being pivoted on a wrist pin on the disk 7 mounted on the end of the motor shaft. The above described mechanism is completely and tightly enclosed by the casing 9 which is shown comprising the base 10 which is thick and massive and the bell 11 which is relatively light and thin. The two parts are tightly secured together by the bolts 12 and by the use of a suitable gasket, the casing is thus made gas tight. Heat produced by the motor and the compressor escapes through the casing to the surrounding air, the radiation of heat being increased by the fins 13 on the shell 11 which fins are also shown supporting the condensing coil 14. One end of the coil 14 connects by the pipe 15 with the upper portion of the casing and the other end connects by the pipe 16 with a chamber, not shown, for condensed refrigerant from which the refrigerant passes to the evaporator or cooling element. Intake pipe 17 from the evaporator passes through the casing and connects with the intake of the compressor by means of a flexible pipe connection 18 formed in a loop in the bottom of the casing. The compressor exhausts directly into the casing from which the compressed gas escapes to the condenser through pipe 15. Current leads, not shown, are also brought through the casing and connect with the motor by suitable flexible connections.

In Fig. 1 the weight of the frame and operating mechanism is carried by the coil spring 20 which rests in a depression in the base 10, supporting the frame 3 through the spider 21. Between the lower portion of the spider and the ring 22 on the base plate 10 are shown four radial coil springs 23 arranged at intervals of 90°, the spring being held in place by short pins respectively on the spider and the ring which project into the opposite ends of the springs. In the upper part of the casing is shown a similar resilient holding means comprising the spider 24, the ring 25 and the springs 26. The various springs while sufficiently yielding to permit vibratory movement of the op-

erating mechanism in all directions do not permit any part of the frame or mechanism coming into direct contact with the enclosing casing.

5 In the form of my invention illustrated by Figs. 3 and 4 the springs 20, 23 and 26 of Figs. 1 and 2 together with spiders and rings associated therewith are omitted and instead the frame 3 supporting the operating
10 mechanism is carried by C-shaped springs 30 secured respectively to the frame 3 and to the casing 9. In this case the same springs 30 both support the operating mechanism and position it in the casing. To provide
15 sufficient room for the springs 30 the bell 31 differs from that of Fig. 1 in that it is shown of the same diameter throughout its length. The arrangement otherwise is similar to that shown in Fig. 1.

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

1. A refrigerating machine comprising an operating mechanism including a motor and a refrigerant compressor connected to be
25 driven thereby, a condenser communicating with said compressor, a casing completely enclosing the mechanism and forming a chamber for the compressed refrigerant, and

resilient means for supporting the mechanism in the casing in spaced relation with
30 the walls thereof.

2. An air-cooled refrigerating machine comprising an operating mechanism including a compressor and a driving motor connected thereto, a condenser communicating
35 with said compressor, a heat radiating gas tight enclosure for the mechanism comprising a base member and a bell secured thereto, the walls of the bell being spaced from the mechanism and resilient supporting means
40 between the mechanism and the base.

3. An air-cooled refrigerating machine comprising an operating mechanism including an electric motor and a compressor connected to be driven thereby, a condenser
45 communicating with said compressor, a gas tight casing enclosing the operating mechanism comprising a massive base member, a relatively light bell, means for tightly securing the bell to the base member, and
50 spring means for supporting the operating mechanism on said base in spaced relation with the walls of said bell.

In witness whereof, I have hereunto set my hand this 3d day of February, 1927.

EDWIN H. HULL.