PUBLISHED
APRIL 27, 1943.
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REFRIGERATOR EQUIPPED WITH A MOTOR-DRIVEN REFRIGERATING APPARATUS OF THE COMPRESSION TYPE
Filed May 23, 1940

Serial No.
336,692

Fig. 1

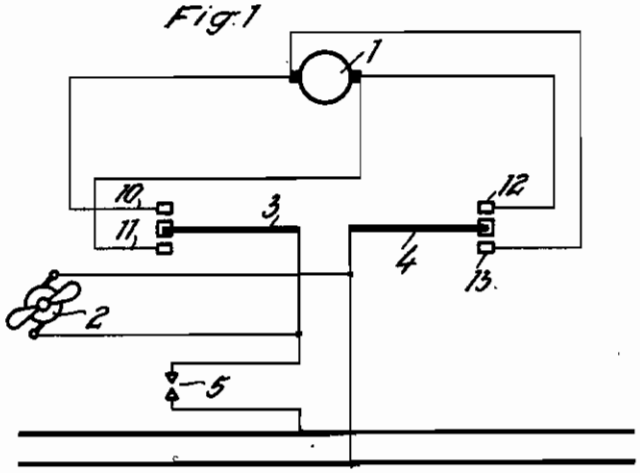


Fig. 2

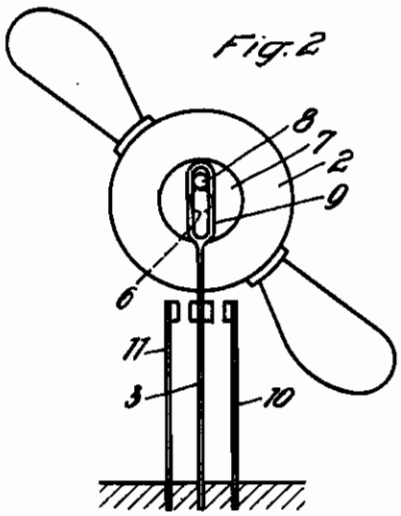


Fig. 3

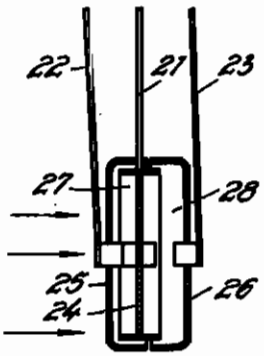
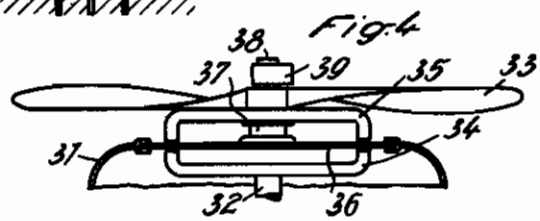


Fig. 4



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ALIEN PROPERTY CUSTODIAN

REFRIGERATOR EQUIPPED WITH A MOTOR-DRIVEN REFRIGERATING APPARATUS OF THE COMPRESSION TYPE

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Application filed May 23, 1940

This invention relates to a refrigerator equipped with a motor-driven refrigerating apparatus of the compression type.

To avoid the use of stuffing-boxes in such apparatus, the compressor and the driving motor are, as is well known, arranged in a common sealed housing. In such totally enclosed sets, the motor can only be provided with a squirrel-cage rotor. Accordingly, these totally enclosed sets have hitherto been designed for alternating current only. It has already been proposed in such enclosed sets to supply the driving motor with alternating current through a contact-type inverter connected to a direct-current supply circuit. In this case, it is therefore possible to operate the totally enclosed sets designed for alternating current, also with direct current when employing a contact-type inverter which may, for instance, be combined with the refrigerator.

The invention relates to a particularly simple design of a contact type inverter for the above-mentioned purpose. According to the invention the contact type inverter is driven by an electric motor combined with the refrigerator and which preferably at the same time drives a fan for supplying cooling air. Since in the totally enclosed refrigerating apparatus of the compression type a special fan is, as a rule, employed for carrying off the heat of cendensation and the waste heat of the motor-compressor set, it is only necessary to couple a contact type inverter with the motor shaft of the fan, thus providing a very simple drive for the inverter. This drive is preferably so designed that the oscillating contact of the inverter is operated by the motor shaft through an eccentric drive.

When employing contact type inverters care should be taken to cool the contacts in an effective manner, since owing to the continual interruptions of the current considerable amounts of heat are liberated which may cause a deterioration of the contacts. According to the invention cooling disks are therefore firmly secured to the contacts of the inverter and have a sufficiently large cooling surface in contact with the outside atmosphere. This arrangement may preferably be so designed that the cooling disks secured to the stationary contacts surround the cooling disks attached to the movable contacts in a bell-shaped manner. By thus designing the cooling disks, a powerful circulation of air may be obtained in operation by the movements of the contacts, owing to the suction and pressure effects brought about thereby so that the cooling of the contacts is very effectively supported by the shape of the cooling disks.

In the accompanying drawings are shown some embodiments of the invention in diagrammatic form. Fig. 1 shows a circuit diagram of a refrigerating apparatus of the compression type. Fig. 2 shows the drive for the contact circuit breaker.

Referring to the drawings, 1 denotes the totally enclosed motor for driving the compressor; 2 is the fan motor controlling the contact circuit breakers 3 and 4. 5 denotes the thermostat in heat contact with the evaporator and which at the same time connects and disconnects the fan motor and opens and closes the contact circuit breaker serving to supply the alternating current. On the shaft 6 of the fan motor is secured a disk 7 provided with an eccentric 8. The contact 3 has a slot 9 cooperating with the eccentric 8 so that with the fan motor 2 in operation it is caused to oscillate, thus alternately closing the circuit through the counter-contacts 10, 11 and 12, 13 respectively. By varying the amplitude of the contact carrier (spring 3), the time during which the apparatus is inserted in the circuit may be correspondingly adjusted in a known manner.

In order to attain an intense cooling of the contacts of an electromagnetically or motor-driven contact circuit breaker, the contact circuit breaker 21 and the counter-contacts 22 and 23 are rigidly secured to the cooling ribs 24, 25, 26 which may, for instance, consist of copper.

The cooling ribs may have the form as shown in Fig. 3 so that when the contact arm 21 oscillates a powerful circulation of air, which supports the cooling of the contacts, is obtained by the suction and pressure effects occurring alternately in the spaces 27 and 28. The outer surface of the arrangement may come into contact with cooling air blown over the contact arrangement in the direction as indicated by the arrows, for instance, by means of the fan of the refrigerating apparatus.

In Fig. 4 is shown another embodiment of the invention in which a totally enclosed motor-driven compressor is employed for the refrigerating apparatus. 31 denotes the housing enclosing the set. 32 is the shaft of the driving motor (not shown). The fan 33 arranged exteriorly of the housing is driven by the electric motor enclosed in the housing. To this end, a magnet 34 is secured to a motor shaft 32, whereas the fan 33 is secured to the second magnet 35. 36 denotes a part of the compressor-motor housing consisting of non-magnetic material and arranged between the two magnets. The fan is mounted in the bearing 37 firmly secured to the part 36 of the housing. To the upper end 38 of the shaft of the fan is secured an eccentric 39 which as shown in Fig. 2 serves to drive a contact type inverter.

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