May 21, 1935. G. R. OHMART 2,001,885

REFRIGERATING APPARATUS

Filed May 11, 1932

Fig. 1.

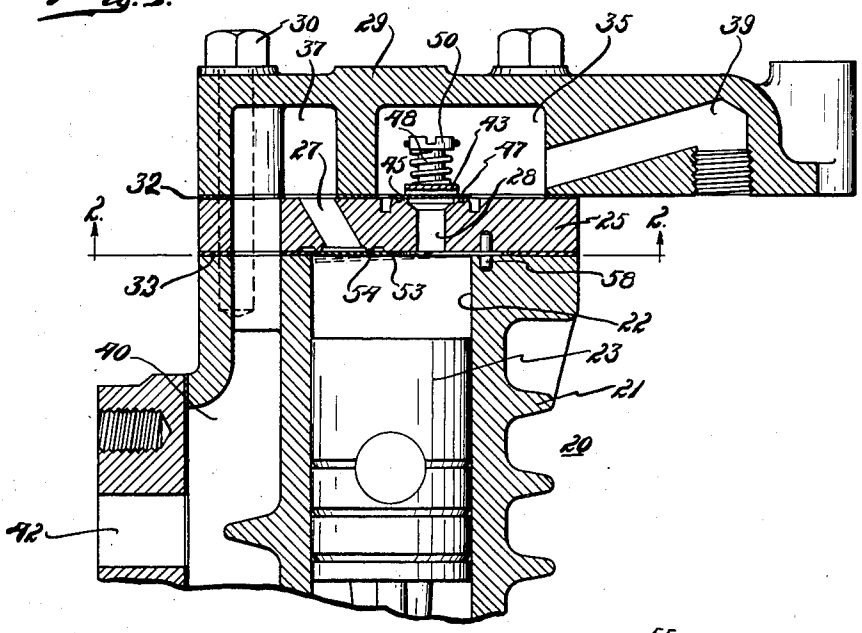


Fig. 3.

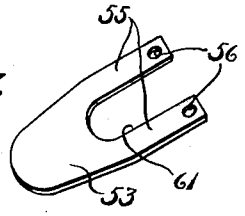
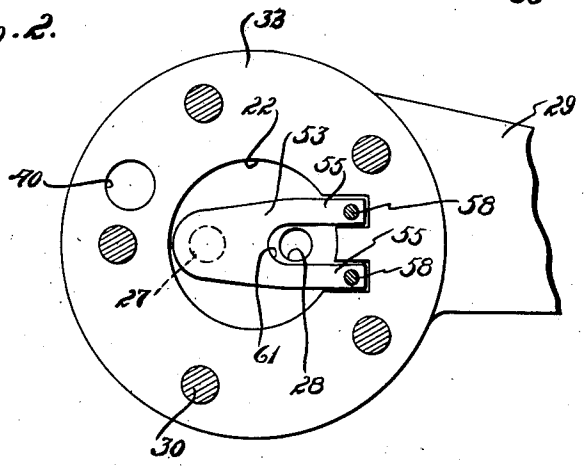


Fig. 2.



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REFRIGERATING APPARATUS

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2 Claims. (Cl. 230—228)

This invention relates to refrigerating apparatus and more particularly to compressors employed in such apparatus.

Heretofore it has been the practice to conduct vaporized refrigerant through the crankcase of a refrigerant compressor whence it passed through a valve in the compressor piston into the compression chambers to be compressed. This arrangement has been found to be undesirable for the reason that it permitted some of the lubricating oil stored in the crankcase for lubricating the compressor parts to be passed into the compression chamber whence it was pumped to other parts of the refrigerating system where it was not needed. The amount of oil pumped from the crankcase to other parts of the system depended upon the amount of foaming of oil in the crankcase and the quantity of oil which became entrained in the refrigerant vapor.

Another manner of controlling the admission of refrigerant vapor to the compression chamber included controlling the inlet port leading to said chamber by means of poppet valves. This arrangement has been found to be unsatisfactory for the reason that in order to provide a valve of this type which would open sufficiently to permit the proper amount of refrigerant vapor to enter the compression chamber the valves were very noisy in operation and were unsuitable for use in connection with refrigerating apparatus and particularly so in connection with refrigerating apparatus of the so-called household type.

By my invention I obviate the above difficulties by providing a compressor with an improved valve arrangement which is not conducive to oil pumping and which permits operation with but little, if any, audible sounds.

Another object of the invention is to provide a refrigerant compressor in which the inlet port for fluid to be compressed is arranged in a wall of the compression chamber and to provide a resilient reed valve within the chamber for controlling the inlet port.

Another object of the invention is to provide a refrigerant compressor valve having substantially noiseless operational characteristics and which will be capable of operating during long periods of time without adjustment or partial or total failure and one which is inexpensive to manufacture.

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 view in cross section of a refrigerant compressor embodying features of the invention;

Fig. 2 is a view taken in the direction of the arrows 2—2 of Fig. 1; and

Fig. 3 is a perspective view of the refrigerant valve proper.

Referring to the drawing, 20 designates a compressor comprising in general a cylinder block 21 provided with a cylinder or compression chamber 22 in which a piston 23 is adapted to be reciprocated. The compressor also includes a valve plate 25 mounted on the cylinder block. The plate 25 forms the top wall of the chamber 22. Provided in the plate 25 are an inlet port 27 and a discharge or outlet port 28. Mounted upon the valve plate is a compressor head portion 29. The head portion 29 and valve plate are rigidly secured to the cylinder block by screws 30.

A gasket 32 is provided between the head portion and the valve plate, and a gasket 33 is provided between the valve plate and cylinder block. The cylinder head 29 is formed with a discharge valve chamber 35 which is in communication with the outlet port 28, and a chamber 37 which is in communication with the inlet port 27. A passage 39 is provided in the cylinder head 29 through which the compressed refrigerant passes to a refrigerant condensing element (not shown). A chamber 40 formed in the cylinder block is in communication with the inlet port 27 and also in communication with a refrigerant cooling element or evaporator, (not shown), through opening 42.

An exhaust valve mechanism 43 is disposed within the chamber 35 for controlling the discharge port 28. The upper wall of the valve plate 25 is provided with a circular flanged seat 45 adjacent the port 28 and a thin metal closure disc 47 is arranged to engage with the seat flange 45. A coil spring 48 arranged between a stop member 50 and the closure disc 47 is provided to normally urge the disc to close the exhaust port 28. When the disc is lifted from its seat by compressed refrigerant overcoming the tension of the spring, refrigerant enters the chamber 35 and passes through the passage 39 to the condenser.

In order to provide a valve which is noiseless in operation and one which is not conducive to oil pumping for controlling the admission of refrigerant to the compression chamber 22, I have

provided a resilient reed valve 53. This valve is disposed within the chamber 22 where it cooperates with an annular valve seat 54. As shown the valve is secured on one end between the plate 25 and the cylinder block adjacent the discharge port and the free end of the valve engages the valve seat. Thus it will be noted that there is a planar connection between the fixed end of the valve and the valve seat.

As shown more clearly in Fig. 3 the fixed end of the valve member is bifurcated, providing two legs 55. These legs are provided with openings 56 through which extend pins 58. These pins prevent lateral movement of the valve member and, as shown in Fig. 1, the pins are partially received in the plate 25 and partially received in the cylinder block 21. With this arrangement it will be seen that the discharge port is at all times in open communication with the cylinder through the cut-away portion or space 61 between the legs of the valve.

On the down or suction stroke of the piston, a partial vacuum is produced within the cylinder whereby the reed valve is flexed downwardly permitting the entrance of fluid through the inlet port to the chamber 22. On the up or compression stroke, the valve closes the inlet port and the gas is freed through the discharge port whence it is delivered to the condenser.

From the foregoing it will be noted that I have provided an improved arrangement for passing fluid to and from a compression chamber. In addition, it will also be noted that I have provided a control valve for a refrigerant compressor which permits noiseless operation and one which is not conducive to oil pumping.

Although only a preferred form of the invention has been illustrated, and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

What I claim as my invention is:

1. In a compressor the combination with means providing a compression chamber, said means having inlet and outlet ports communicating with the interior of said chamber, a reed valve having a pair of relatively narrow supporting legs at one end secured to said means and constituting the sole support of said reed valve, and said valve being so positioned that the free end thereof is arranged for controlling one of said ports and the space between said supporting legs being in alignment with the other port to permit the passage of fluid through the latter port.

2. In a compressor the combination with means providing a compression chamber, said means having inlet and outlet ports communicating with the interior of said chamber, a reed valve having a pair of relatively narrow supporting legs at one end secured to said means and constituting the sole support of said reed valve, and said valve being so positioned that the free end thereof is arranged for controlling one of said ports and the space between said supporting legs being in alignment with the other port to permit the passage of fluid through the latter port, and locating pins extending through each of said legs and carried by said means.

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