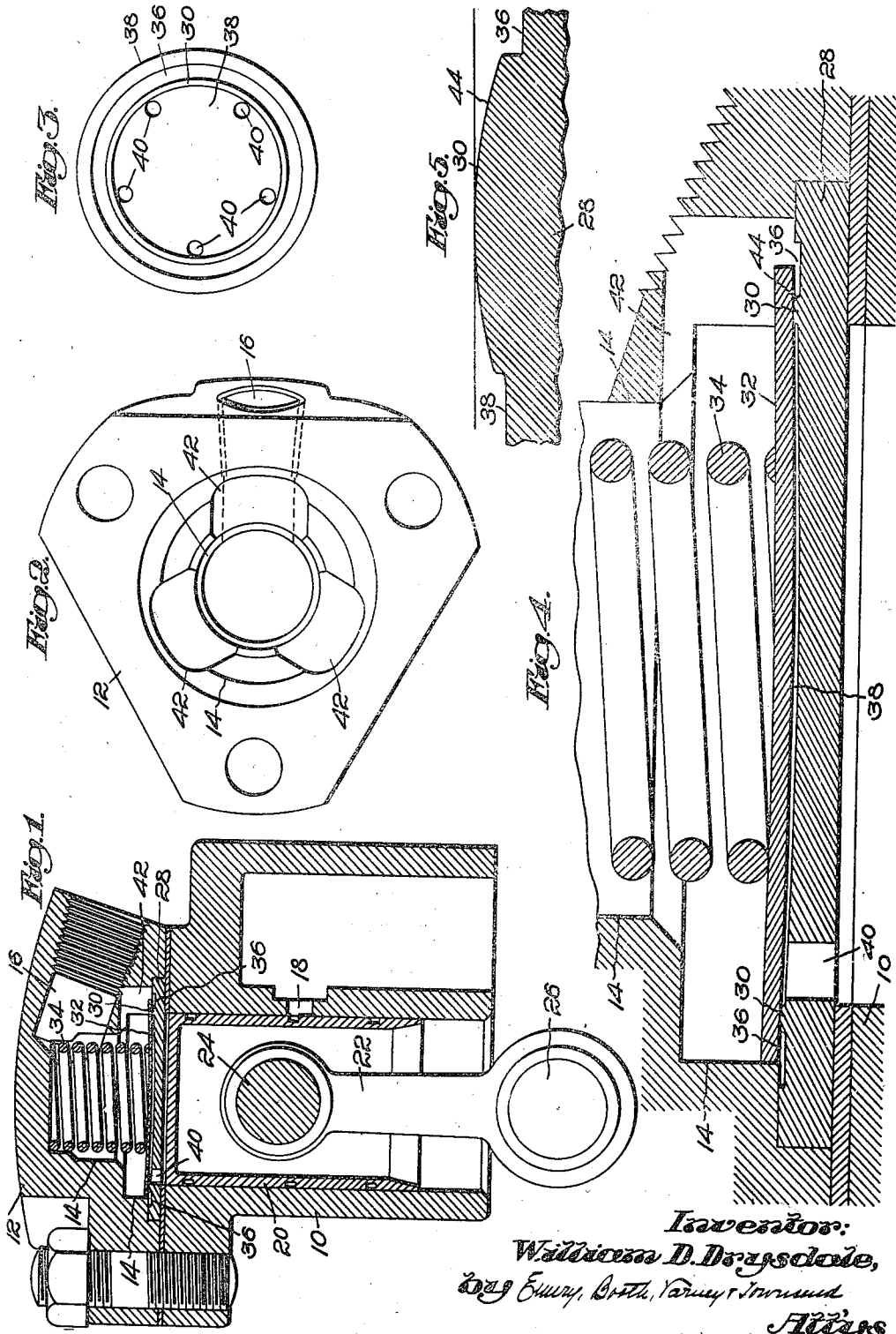


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REFRIGERANT COMPRESSOR

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REFRIGERANT COMPRESSOR

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2 Claims. (Cl. 230—229)

This invention relates to refrigerant compressors of the reciprocating type and is concerned with an automatic, non-return, discharge valve of the wafer type, past which the refrigerant gas is driven by the piston toward an outlet, whence it passes to a condenser. The invention aims to improve the valve structure, and in particular to provide a quiet acting and tight seating valve.

The invention will best be understood by reference to the following description when taken in connection with the accompanying drawing of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is a sectional view of a refrigerant compressor having a valve structure embodying the invention;

Fig. 2 is a bottom plan of the cylinder head;

Fig. 3 is a top plan of the plate which presents a seat and cushioning means for the valve;

Fig. 4 is a greatly enlarged, sectional view of the valve structure; and

Fig. 5 is a still further enlarged section of a portion of the valve seat and the valve.

Referring to the drawing and to the embodiment of the invention which is illustrated therein, there is shown a compressor comprising a cylinder 10 having a head 12 provided with a chamber 14 from which an outlet passage 16 leads. The cylinder is provided with a lateral intake port 18 which is covered and uncovered by a piston 20 in its reciprocation under the influence of a connecting rod 22, whose upper end is attached to the piston by a wrist pin 24 and whose lower end is driven by a crank pin 26.

The cylinder head is chambered to receive a valve plate 28 presenting an elevated, annular valve seat 30 for a flexible disk or wafer valve 32, which is normally seated by a spring 34 resting upon the top of the valve. The valve plate is also provided with an annular groove 36 which encircles the seat below the valve, and in this groove a body of oil carried along with the refrigerant is trapped by the valve (see the left-hand side of Fig. 4) and the latter is thereby cushioned as it seats. This is an important factor in the silencing of the valve, particularly when the compressor is used in a domestic refrigerator.

Another factor is a concave recess 38 which is encircled by the seat, said recess providing a deep clearance to prevent the valve, when it flexes toward the central portion of the plate, from striking the latter within the area bounded

by the seat. It should be understood, of course, that when the valve is seated the gas pressure in the chamber 14 bends the thin wafer valve, as shown in Fig. 4, and the wafer becomes concave on its upper side and convex on its lower side. The depth of the concavity in the valve plate is properly proportioned to the flexibility of the valve to prevent the latter from striking the plate.

The valve plate is provided with one or more, herein a plurality, of openings 40 within the area bounded by the valve seat for the passage of gas from the cylinder through the plate and into the recess 38. During the compression stroke of the piston gas is driven through these openings into the recess, thus lifting the valve against the yielding resistance presented by the spring, and the gas passes across the valve seat and is driven past the margin of the valve through one or more, herein a plurality, of recesses 42 (see Fig. 2 and also the right-hand side of Fig. 4) into the chamber 14, whence it passes to the outlet 16. The margin of the valve, as it rises and falls, is guided by the sides of the chamber.

The valve seat has a rounded top or convexly curved surface 44 (see Fig. 5) on which the valve rocks as it flexes and thus maintains a perfect seal. As the piston drives the gas upwardly against the valve, the latter straightens and rocks on its seat.

Particles of foreign matter borne by the gas, instead of lodging on the seat and interfering with the proper sealing, are swept across the seat into the surrounding oil groove 36 where they can do no harm. This contributes to a tight sealing and effective cushioning of the valve.

Having thus described one embodiment of the invention but without limiting myself thereto, what I claim and desire by Letters Patent to secure is:

1. In combination a refrigerant compressor having a vertical cylinder and a piston whose upward stroke drives the refrigerant upwardly, a valve plate presenting on its upper side a single, elevated, annular valve seat, an annular groove which encircles said seat, a recess which is encircled by said seat, and one or more openings within the area bounded by said seat for the passage of gas from the cylinder through said plate and into said recess, a flexible, imperforate disk valve which is bodily movable vertically and normally rests upon said seat and whose margin extends from said seat outwardly over said groove, a cylinder head provided with an outlet

chamber having a vertical circumferential surface which guides the circumferential margin of said valve, and one or more recesses, through which gas passing across said valve seat is driven
5 past the margin of said valve into said chamber, and a spring within said chamber and resting upon the top of said valve.

2. In combination a refrigerant compressor having a vertical cylinder and a piston whose
10 upward stroke drives the refrigerant upwardly, a valve plate presenting on its upper side a single, elevated, annular valve seat, an annular groove which encircles said seat, a recess which is encircled by said seat, and one or more openings
15 within the area bounded by said seat for the passage of gas from the cylinder through said

plate and into said recess, a flexible imperforate disk valve which is bodily movable vertically and normally rests upon said seat and whose margin extends from said seat outwardly over said
5 groove, a cylinder head provided with an outlet chamber having a vertical circumferential surface which guides the circumferential margin of said valve, and one or more recesses, through which gas which passing across said valve seat
10 is driven past the margin of said valve into said chamber, said cylinder head being chambered to receive said valve plate, and a spring within said chamber and resting upon the top of said valve.

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