Feb. 24, 1925. 1,527,545

J. G. EMMERLING

COMPRESSOR

Filed Aug. 12, 1921 2 Sheets-Sheet 1

Fig. 1.

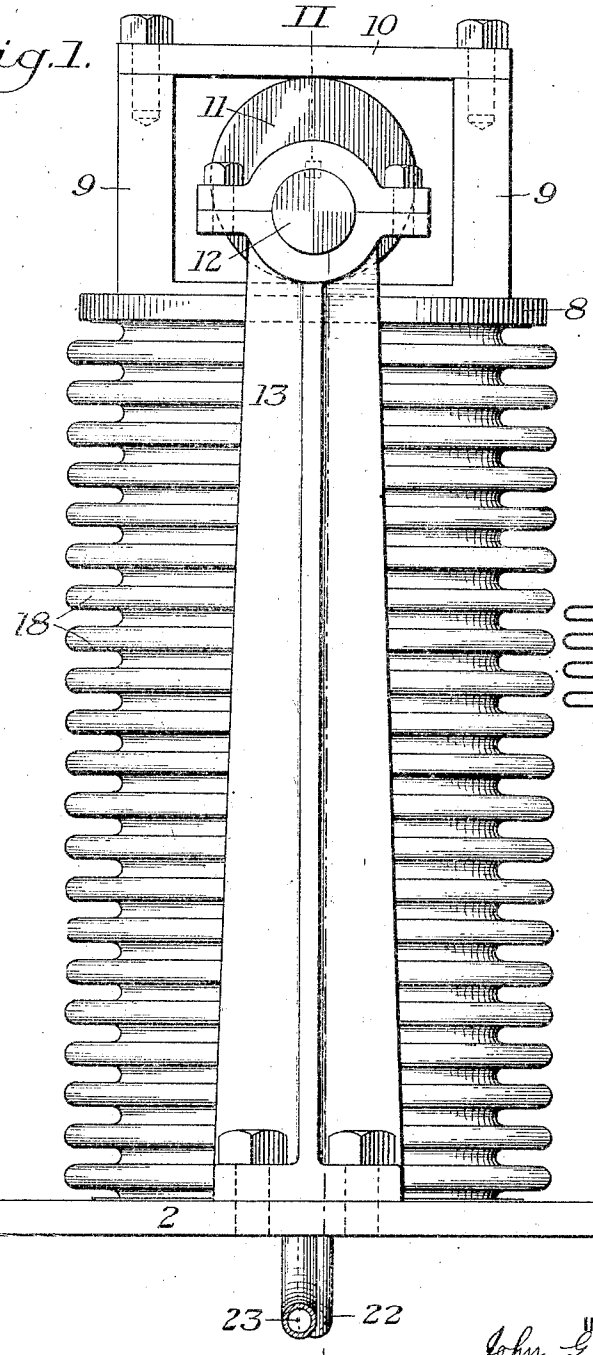
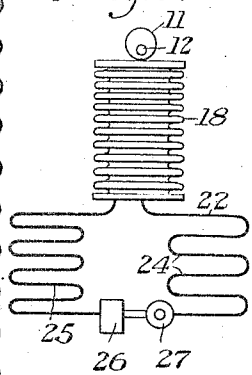


Fig. 3.



INVENTOR
John G. Emmerling,
By Byrnes, Stubbs, Burgess & Parmelee,
his Attys

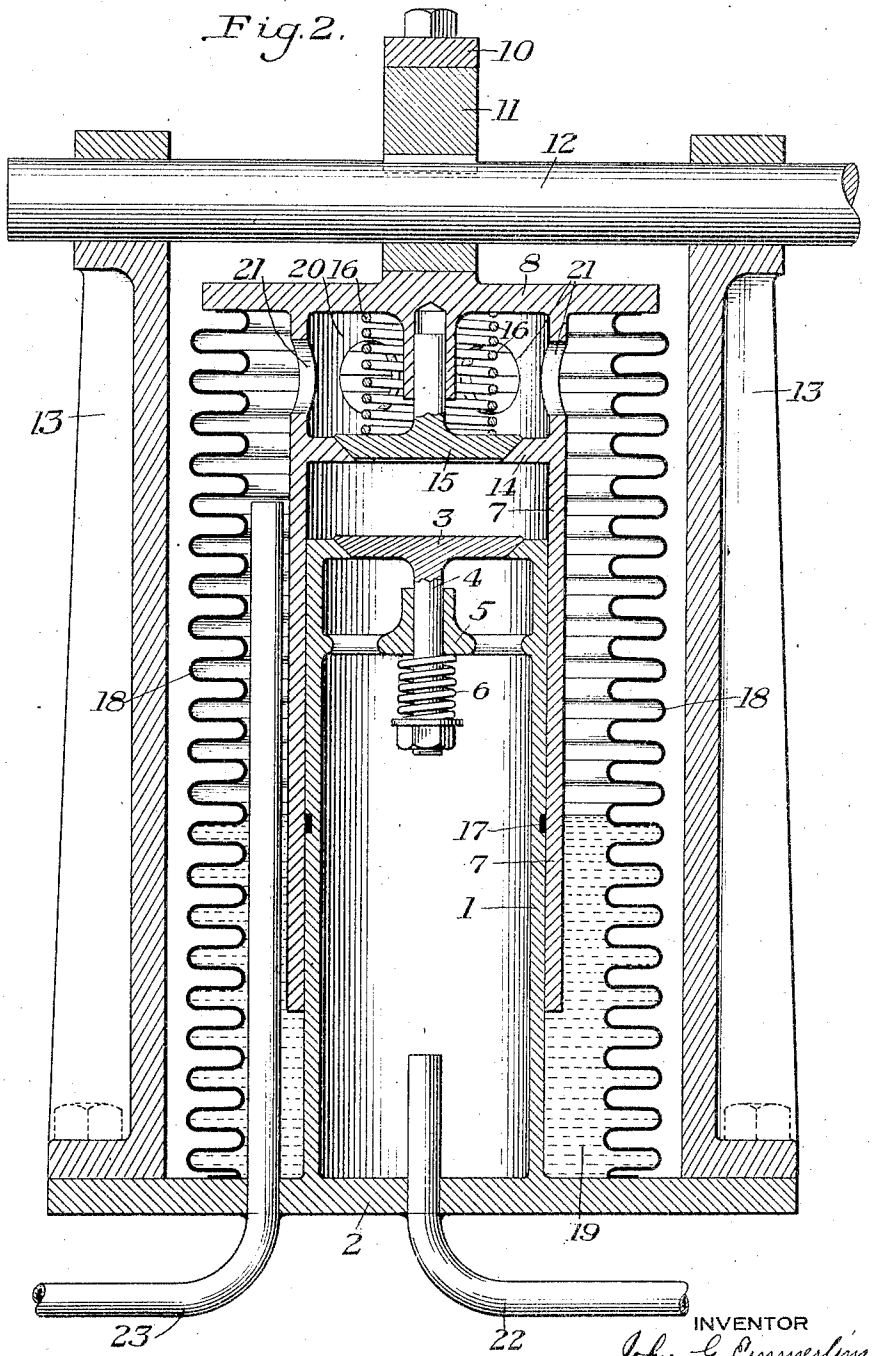
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Fig. 2.



INVENTOR

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his attys

Patented Feb. 24, 1925. 1,527,545

UNITED STATES PATENT OFFICE.

JOHN G. EMMERLING, OF JOHNSTOWN, PENNSYLVANIA.

COMPRESSOR.

Application filed August 12, 1921. Serial No. 491,691.

To all whom it may concern:

Be it known that I, JOHN G. EMMERLING, a citizen of the United States, residing at Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Compressors, of which the following is a full, clear, and exact description.

The present invention relates broadly to compressors, and more particularly to compressors particularly designed for use in connection with refrigerating systems.

An important object of the present invention is to provide a compressor requiring a minimum of packing between the parts thereof.

A further object of the present invention is to provide a compressor having means for automatically lubricating all of the working parts.

A still further object of the invention is to provide a compressor which is automatically lubricated and in which the lubricant employed is subjected to a continuous cooling action.

Still another object of the invention is to provide a compressor of such construction that damage thereto by the action of unspent or unexpanded refrigerant is prevented.

The foregoing and other objects of the present invention, together with their attendant advantages, will be apparent as the invention becomes better understood by reference to the accompanying specification and drawings forming a part thereof, it being premised that changes may be made in the various details and the manner of operation within the scope of the appended claims without departing from the spirit of the invention.

Figure 1 is a side elevation of a compressor constructed in accordance with the present invention;

Figure 2 is a vertical sectional view on the line II—II of Figure 1; and

Figure 3 is a diagrammatic view illustrating a system embodying the present compressor.

Referring more particularly to the drawings, there is disclosed a compressor peculiarly adapted for use with expansible cooling fluids intended for refrigeration purposes, comprising a stationary hollow piston member 1 mounted on a suitable supporting base 2. The upper end of the stationary piston 1 is provided with a seat adapted to receive an upwardly opening valve 3 provided with a stem 4 slidably guided in a suitable spider 5 formed internally of the piston. The valve 3 is urged normally into its closed position by a compression spring 6.

Surrounding the piston 1, and telescopically mounted with relation thereto is a cylinder 7 having a solid head 8 provided with upwardly extending posts 9 connected by a cross bar 10. Intermediate the cylinder head 8 and the cross bar 10 is mounted an eccentric 11 keyed to the transverse shaft 12 journaled in suitable supports 13 mounted on the base 2. By rotating the shaft 12 from any convenient source of power, not shown, it will be apparent that the eccentric 11 will be effective for raising and lowering the cylinder 7 with respect to the piston 1.

Intermediate its ends, the cylinder 7 is provided with a transverse partition 14 having a seat for an upwardly opening valve 15 normally held seated by a compression spring 16 abutting at one end against the valve and at its other end against the under side of the cylinder head 8. If desired, the piston 1 may be provided with a piston ring 17 of any usual construction forming a working bearing and packing between the two members.

Surrounding both the piston and the cylinder, and spaced therefrom, is a flexible enclosing casing 18 preferably constructed of corrugated sheet metal as clearly shown in the drawings. At one end this enclosing casing, or bellows, as it may be termed, is secured to the base 2 of the compressor, while its opposite end is secured to the head 8. The points of connection of the casing 18 with the base and the cylinder head are fluid tight, whereby during assembly of the parts the space intermediate the cylinder and piston walls and the casing may be filled to any desired height with lubricating oil 19. With such a construction, it will be apparent that during the operation of the compressor the oil 19 effectively lubricates the working parts thereof and enables the compressor to be operated with a minimum of packing.

Communicating with the interior of the casing 18 and connecting the same with the valve chamber 20, is a series of ports 21. Extending into the hollow stationary piston

1 is an inlet connection 22, while extending into the casing 18 and projecting above the level of the oil 19 therein, is an outlet connection 23. During operation of the compressor, the up stroke of the cylinder 7 will result in opening the valve 3, thereby causing the expanded refrigerant to pass from the expansion coil 24 into the space between the cylinder and piston. On the down stroke of the cylinder 7, the valve 15 will be opened by the compression of the refrigerant, which will pass through the openings 21 into the outlet 23 and thence to a suitable condensing coil 25. As is usual in installations of this nature, the condensing coil 25 may communicate with a storage receiver 26 having a connection with the expansion coil 24 through a suitable expansion valve 27.

In case any unspent liquid passes through the inlet 22, the interior of the piston 1 forms a chamber in which it can expand before passing by the valve 3. This prevents the presence of any liquid which might blow off the head of the compressor. The oil 19 effectively seals all of the joints and automatically lubricates the entire mechanism. This lubricant is cooled continuously during the operation of the compressor by the refrigerant itself.

The advantages of the present invention arise from the provision of the flexible enclosing casing eliminating the necessity of special packing for the compressor.

Further advantages arise from the provision of the sealing and lubricating fluid.

I claim:

1. A compressor comprising a piston member, a cylinder member, a flexible extensible casing secured at one end to one of said members and at the other end to the other of said members and forming a chamber surrounding said members, a lubricating fluid partially filling said chamber, and an outlet pipe extending into said chamber above the level of the lubricating fluid therein, substantially as described.

2. A compressor comprising a relatively stationary hollow piston member, an inlet connection communicating with the interior of said member, an upwardly opening valve in said member, a relatively movable cylinder member telescopically mounted with respect to said piston member, an upwardly opening valve in said cylinder member, a flexible extensible casing secured at one end to said piston member and at its opposite end to said cylinder member and forming a chamber surrounding said members, and an outlet connection communicating with said chamber, substantially as described.

3. A compressor comprising a relatively stationary hollow piston member, an inlet connection communicating with the interior of said member, an upwardly opening valve in said member, a relatively movable cylinder member telescopically mounted with respect to said piston member, an upwardly opening valve in said cylinder member, a flexible extensible casing secured at one end to said piston member and at its opposite end to said cylinder member and forming a chamber surrounding said members, an outlet connection communicating with said chamber, and a lubricating fluid partially filling said chamber, substantially as described.

4. A compressor comprising relatively movable telescoping members, a flexible casing forming a sealed joint between said members and also forming with said members a chamber surrounding the latter, means for admitting the fluid to be compressed to the space between said members, outlet means from said space to said chamber, and means for conducting the compressed fluid from said chamber, substantially as described.

5. A compressor for refrigerating systems, comprising relatively movable compressing members forming a chamber therebetween, a flexible casing forming a sealed joint between said members and also a chamber surrounding the latter, a sealing fluid in said second-mentioned chamber, outlet means from said first-mentioned chamber to said second-mentioned chamber, means for conducting the fluid to be compressed to said compressor, and means for conducting the compressed fluid therefrom, substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHN G. EMMERLING.