Feb. 25, 1930. G. M. TROUP 1,748,531

REFRIGERATING APPARATUS

Filed May 2, 1925

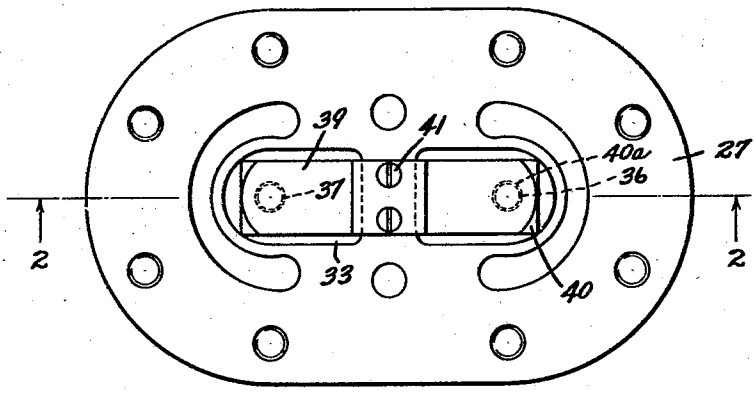


Fig. 1

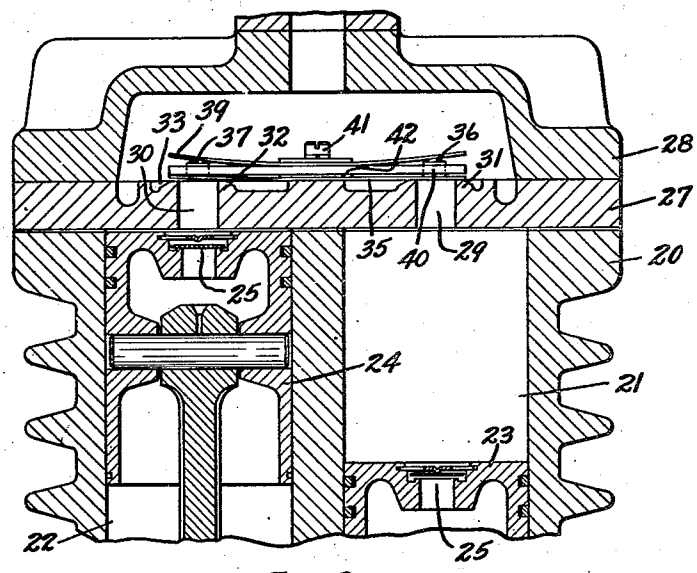


Fig. 2

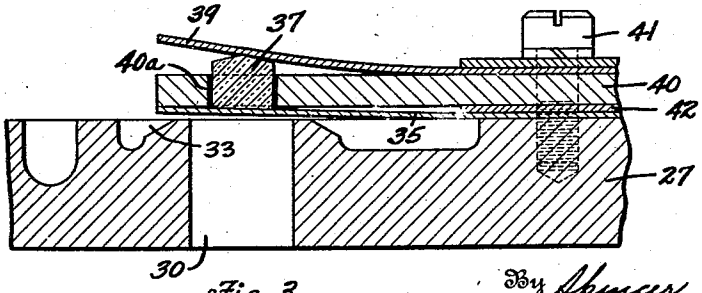


Fig. 3

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UNITED STATES PATENT OFFICE

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REFRIGERATING APPARATUS

Application filed May 2, 1925. Serial No. 27,373.

The present invention relates to valves and particularly to outlet valves for compressors. It is among the objects of the present invention to simplify the construction, to reduce the cost of manufacture, to provide for the quiet operation, and to improve the general construction of the above type of valve.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a top plan view of the improved valves showing same attached to a valve plate of a compressor.

Fig. 2 is a sectional view of a compressor showing the valves, the section being taken on line 2—2 of Fig. 1, and

Fig. 3 is an enlarged fragmentary sectional view of the invention.

Referring to the drawing, a compressor 20 is shown provided with two cylinders 21 and 22 which receive two pistons 23 and 24. The head of each piston is provided with inlet valve 25 through which fluid passes from the crank case of the compressor into the compression chamber of the cylinder. The top of the cylinders 21 and 22 carries a valve plate 27 which in turn carries a cylinder head 28. The valve plate 27 is provided with ports 29 and 30 and valve seats 31 and 32 for the cylinders 21 and 22, respectively. The plate 27 is provided with recesses 33 surrounding the seats 31 and 32.

The valves for the seats include a leaf spring 35 which extends beyond the valve seats 31 and 32. Buttons 36 and 37 constructed of non-metallic vibration-absorbing material such as bakelized paper or the like, are interposed between leaf spring 35 and a second leaf spring 39, and are of such length as to cause the spring 39 to be deflected to tend to hold the spring 35 upon the seats 31 and 32. A plate 40 is interposed between springs 35 and 39 and is perforated as at 40ª to receive buttons 36 and 37, and provides a guide for said buttons. The leaf springs 35 and 39 and plate 40 are secured at their middle portions to the valve 27 and held in cooperative relations by two screws 41. A spacing washer 42 is placed between the spring 35 and guide plate 40 adjacent the middle of the spring to provide a clearance between the plate and the end of the spring so that the spring may function as a flapper valve. The plate likewise serves as a stop for limiting the amount of opening of the valve.

The improved valve is relatively simple in construction and quiet in operation. A flat leaf spring functions as a valve and is held against its seat by a second flat leaf spring. If during the operation of the valve, spring 35 should separate from the buttons 36 and 37 or should the buttons separate from spring 39, there will be substantially no noises created by the re-engagement of the elements, because the buttons are constructed of material, such as bakelized paper, which when engaged by said springs will absorb impacts and vibrations and consequently will produce substantially no noise.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring and a guide for said member, interposed between the valve and spring.

2. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring, a guide for said member, and means common to said valve and spring for maintaining said valve in operative relation with the seat and for maintaining the spring in operative relation with the valve.

3. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring, a guide for said member, and a single means for maintaining said valve in operative relation with the seat and for maintaining said member in operative relation with the valve and spring.

4. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring, a guide for said member, and means common to said spring and guide for maintaining said member in operative relation with the valve and for maintaining said spring in operative relation with the member.

5. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring, a guide for said member, and means common to said valve and to said spring and to said guide for maintaining said valve and said spring and said member in operative relation with one another.

6. Valve apparatus comprising, in combination, a plurality of valve seats, valves comprising a leaf spring covering said seats, a second leaf spring, members disposed between each spring adjacent the valve seats whereby the first leaf spring is normally held on the seats through the action of the second leaf spring, and a guide for said members.

7. Valve apparatus comprising, in combination, a plurality of valve seats, valves comprising a leaf spring covering said seats, a second leaf spring, members disposed between each spring adjacent the valve seats whereby the first leaf spring is normally held on the seats through the action of the second leaf spring, a guide for said members, and means for maintaining the leaf springs and guide in cooperative relation.

8. Valve apparatus comprising, in combination, a valve seat, a flap valve cooperating with said seat, a spring, a vibration-absorbing member disposed between said valve and spring whereby said valve is normally held on the seat through the action of said spring, and a guide for said member.

9. Valve apparatus comprising in combination, a valve seat, a flap valve cooperating with the seat, a spring, a thrust member between the valve and spring for yieldingly holding the valve against the seat, and a guide for the thrust member.

10. Valve apparatus comprising in combination, a valve seat, a flap valve cooperating with the seat, a spring, a thrust member between the valve and spring for yieldingly holding the valve against the seat, means for maintaining the valve in operative relation with the seat, and a guide for the thrust member formed in said means.

11. Valve apparatus comprising in combination, a valve seat, a flap valve cooperating with the seat, a spring, a thrust member between the valve and spring for yieldingly holding the valve against the seat, a spacing means between the spring and valve, said spacing means maintaining the valve in operative relation with the seat, and a guide for the thrust member formed in the spacing means.

12. Valve apparatus comprising in combination, a valve seat, a flap valve cooperating with the seat, a spring, a thrust member between the valve and spring for yieldingly holding the valve against the seat, a stop for limiting the movement of the valve, and a guide for the thrust member formed in said stop.

13. Valve apparatus comprising in combination, a valve seat, a flap valve cooperating with the seat, a spring, a thrust member between the valve and spring for yieldingly holding the valve against the seat, and spacing means between the valve and the spring, said spacing means providing a stop for limiting the movement of the valve.

In testimony whereof I hereunto affix my signature.

GEORGE M. TROUP.