J. H. DENNEDY.

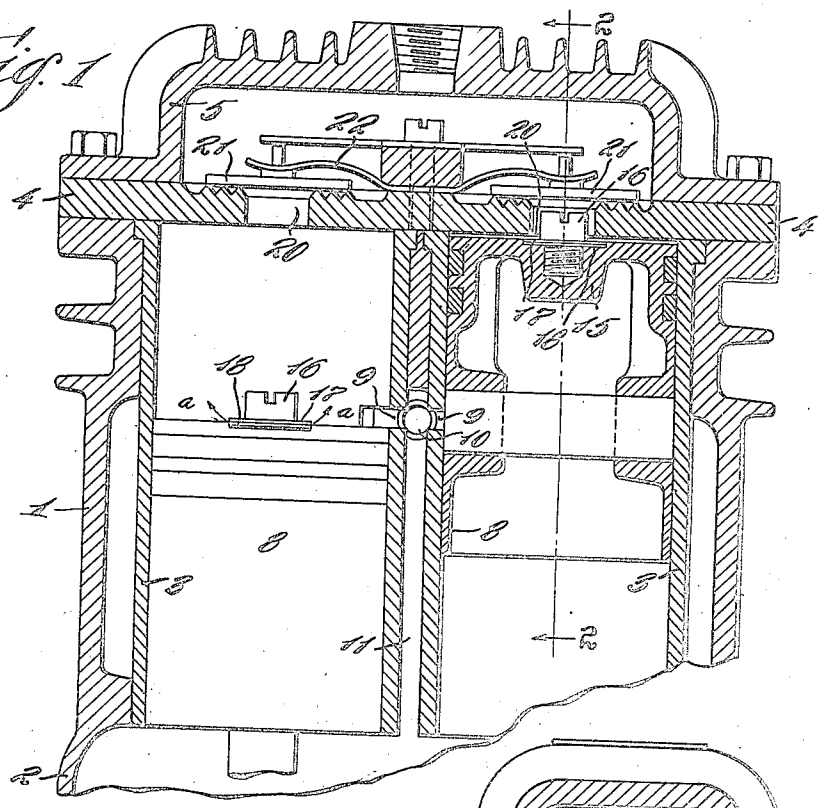
COMPRESSOR.

APPLICATION FILED AUG. 28, 1920.

1,416,696.

Patented May 23, 1922.

Fig. 1



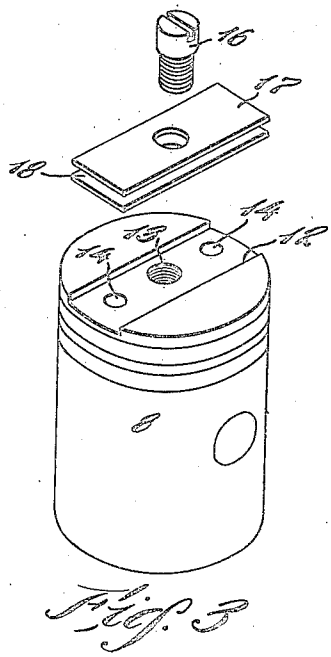


Fig. 3

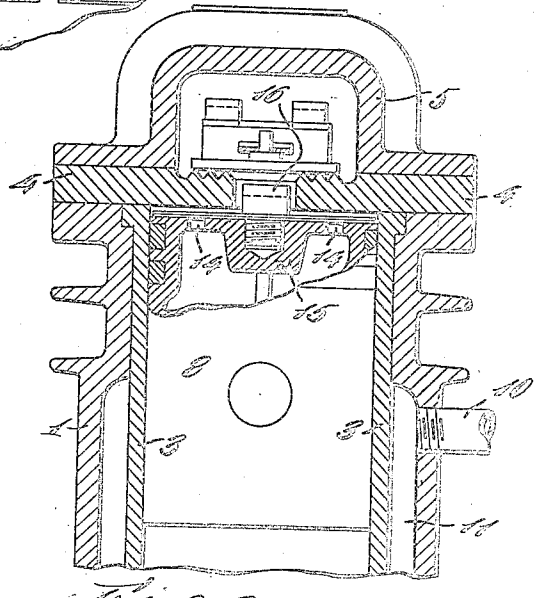


Fig. 2

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UNITED STATES PATENT OFFICE.

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COMPRESSOR.

1,416,696. Specification of Letters Patent. Patented May 23, 1922.

Application filed August 28, 1920. Serial No. 406,595.

To all whom it may concern:

Be it known that I, JAMES H. DENNEDY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a certain new and useful Improvement in Compressors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to compressors for gaseous substances and especially to such compressors as are used in connection with domestic refrigerating systems although not limited to such use. The objects of the invention are the provision of a device of great simplicity, of quiet operation, and of low cost of running; the provision of a device of this character whose moving parts shall be very light, of small clearance, and not liable to get out of repair; while further objects and advantages will become apparent as the description proceeds.

In the drawing accompanying and forming a part of this application, I have shown one of the many mechanical structures in which my inventive idea can be embodied, it being understood that these drawings are designed to illustrate only the general idea of my invention and not to limit me to the particular structures therein shown. In these drawings Fig. 1 is a vertical sectional view through a simple two-cylinder compressor embodying my improvements; Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1; and Fig. 3 is a separated perspective view of one of the pistons with its valves.

Describing the parts by reference characters, 1 represents the outer casing of the compressor which is formed with a crank case 2; 3—3 represent cylinder sleeves located in such casing and held in place by the top plate 4 above which is secured the hollow cap 5. Reciprocably mounted in the sleeves are the pistons 8—8 whose travel is from a point closely adjacent the plate 4 to a point just beyond the side ports 9—9 with which the sleeves are formed. These side ports communicate both with the inlet pipe 10 and with a passageway 11 that leads to the crank case 2.

Formed upon the head of each piston 8 is a shallow, transverse, flat-bottomed slot 12 intersected by a screw hole 13 and also by one or more ports 14. For reasons of symmetry and of manufacturing convenience I prefer to have the screw hole 13 at the center and to employ two ports 14—14 one at each side and as near the piston wall as convenient; also the head of the piston is preferably thickened inside the screw hole so as to form a closed boss 15. However within the scope of my invention other arrangements can be employed, as for example a screw at one end and a port at the other.

Located in this slot 12 is a flap valve, preferably consisting of a sheet or sheets of thin spring metal held in place by these screws. In the present embodiment this valve consists of two sheets or strips 17—18, the upper being of spring steel and the lower of phosphor bronze; although I do not limit myself either to a multiple sheet or to the use of these metals. I have shown a screw of the fillister head type projecting considerably above the head of the piston since this is easier to manufacture and has less adverse affect upon the springiness of the valve sheets than would be the case if the head of the piston were counter-sunk and the sheets stamped to conform thereto. The plate 4 is formed with outlet ports 20—20 one for each cylinder and arranged so as to permit the head of the screw 16 to enter freely therein when the piston is at the top of its stroke. This not only enables the piston head to be brought very close to the end of the cylinder, but even expels the gas which would otherwise remain pocketed in this opening, which at high pressures, and with a small cylinder bears a noticeable proportion to the piston displacement. I have shown the ports 20—20 as closed by automatic valves 21—21, governed by the spring 22, but the particular kind of valve here used is wholly independent of the present invention.

Upon each down stroke of each piston the tendency is to pull a vacuum in the upper part of the cylinder until the port 9 is uncovered, but the production of a vacuum is prevented by the raising of the valve plates and the entry of gas from the crank case as shown by the arrows *a*—*a* in Fig. 1, such gas having entered the crank case through the pipe 10 and passageway 11. As soon as the port 9 is uncovered sufficient additional gas enters to compensate for the amount of suction which was caused by the stiffness of the sheets 17 and 18. While I am aware that poppet valves have sometimes been provided

in piston heads I find less trouble in maintaining tight seating with the valves here shown. I am enabled to make the piston lighter, its action is less noisy and the clearance is decreased. Also the present construction is more practical for small sized pistons.

It will be understood that many modifications of shape, size, and arrangement of parts can be made without sacrificing the benefits herein described, wherefore I do not limit myself to any of the features of construction or arrangement herein set forth except as specifically recited in the annexed claims.

Having thus described my invention, what I claim is:

1. In a compressor, a piston having on its head a wide, shallow, flat bottomed slot, the bottom of said slot having a port and a flap valve of flat elastic, sheet metal located in said slot.

2. In a compressor, a cylinder having at one end an apertured closure, an automatic valve for said aperture and located on the outside of said closure, a piston in said cylinder, and having an inlet port in its head, a valve for said port, and a valve securing member carried by said piston and projecting beyond the head of the same and adapted to project into said aperture when said piston nears said closure.

In testimony whereof, I hereunto affix my signature.

JAMES H. DENNEDY.