July 9, 1929. T. E. MURRAY 1,719,825

PUMP FOR REFRIGERANTS AND THE LIKE

Filed May 13, 1926

Fig. 1.

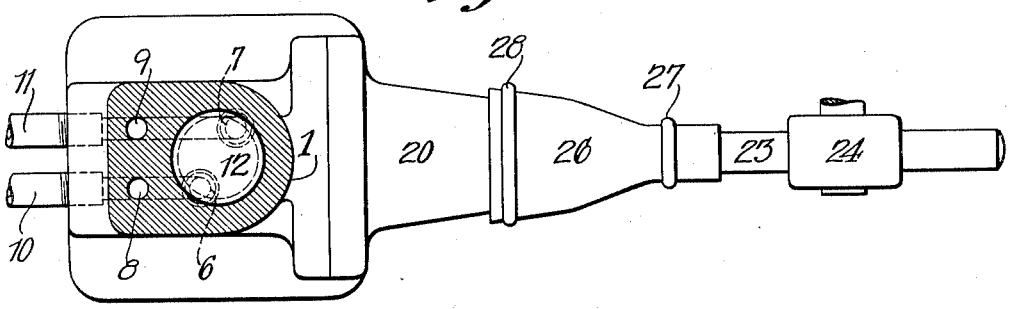


Fig. 2.

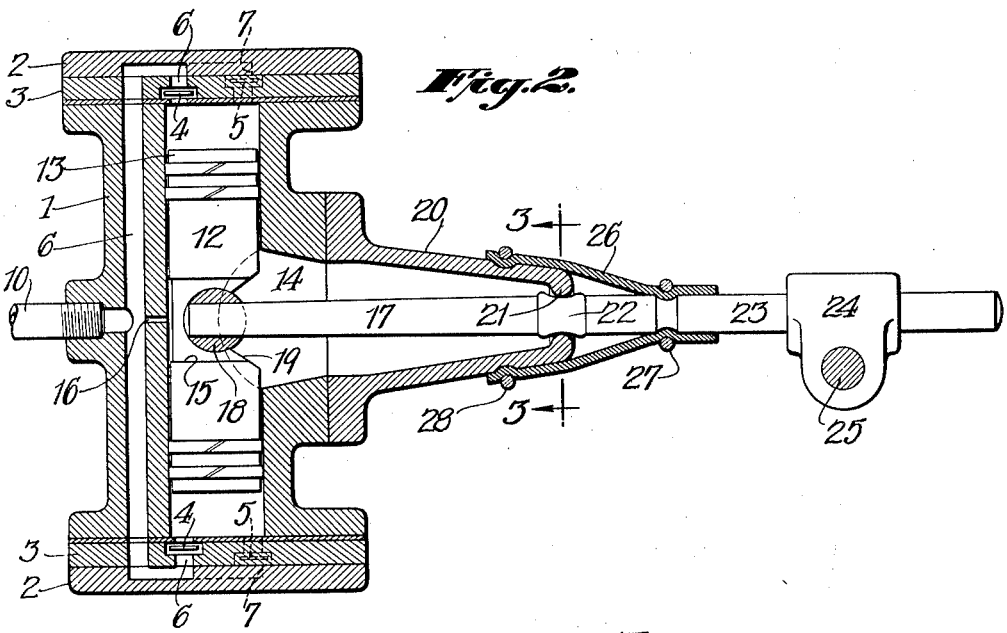
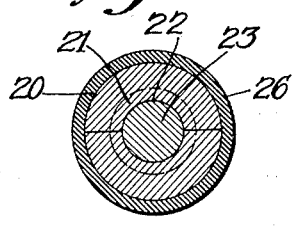


Fig. 3.



Inventor
THOMAS E. MURRAY.
By His Attorney
D. Anthony Usina

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UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF BROOKLYN, NEW YORK.

PUMP FOR REFRIGERANTS AND THE LIKE.

Application filed May 13, 1926. Serial No. 108,799.

In a companion application No. 109,075, filed May 14, 1926, I have described a pump for sulphur dioxide, ammonia or other refrigerating or volatile fluid which is simple and compact and well secured against leakage. The present invention provides improvements in the same class of apparatus. The accompanying drawings illustrate an embodiment of the invention.

Fig. 1 is a plan of the pump with the cylinder in section;

Fig. 2 is a vertical section of the same;

Fig. 3 is a cross section on the line 3—3 of Fig. 2.

The cylinder 1 has heads 2 at opposite ends with interposed plates 3 carrying valves indicated diagrammatically at 4 and 5 for admission and egress of the fluid respectively, leading through ports 6 and 7 and passages 8 and 9 to suction and compression tubes 10 and 11. A piston 12 is provided, with heads 13 at opposite ends, working in the portions of the cylinder which are beyond an opening 14 provided in the side of the latter. The piston is provided with an annular groove 15 around its middle portion which registers with a small duct 16 communicating with the vacuum or suction passage 8; so that any small quantity of the refrigerant leaking past the piston heads will be withdrawn through the duct.

The piston is actuated by the inner arm 17 of a lever passing through the opening in the side of the cylinder and having its free end in a rocker 18 set in a transverse opening through the middle of the piston. The end of the arm slides in the rocker as the arm is oscillated, thus providing a compact rocking and sliding connection. The side of the piston is cut away to provide a flared opening 19 for the end of the arm to move in. A tubular casing 20 (split horizontally as shown in Fig. 3) is fastened to and in communication with the cylinder and surrounds the arm 17, with room for the latter to swing freely. The outer end of the casing 20 has a rounded flange 21 fitting loosely in an annular groove 22 of the lever so as to permit the slight rocking movement required.

The outer portion 23 of the lever carries a driving block 24 arranged to slide on the lever and having a lug which embraces the crank pin 25 by which the arm is rocked.

The loose pivotal joint of the lever in the casing 20 is sealed by a rubber tube 26 having a small end which is clamped around a groove in the outer arm of the lever by a ring 27 and has a larger end which is similarly clamped around the casing 20 by a ring 28. The extent of movement of the arm is very slight and is taken up through the length of the rubber tube with comparatively little distortion so that the seal will last a long time in good condition. Various other flexible fluid-tight materials may be used instead of rubber, such for example, as known compositions containing rubber. The sliding connection of the driving block 24 and of the rocker 18 with the lever, and the loose pivot joint permit a certain longitudinal play of the lever, and the seal is well adapted to yield to such movement without injury.

Various modifications may be made by those skilled in the art without departure from the invention as defined in the following claim.

What I claim is:

In a pump for refrigerants and the like, the combination of a piston, a cylinder, a split casing open to the cylinder at one end and extending laterally therefrom, a lever engaging the piston at one end and extending substantially straight through the outer end of the casing, the lever having an annular groove directly engaging the end portion of the casing in rocking relation, and a flexible fluid tight tube attached to the outer portion of the lever and to the wall of the casing.

In witness whereof, I have hereunto signed my name.

THOMAS E. MURRAY.