A. A. DITTMAR.

PUMP.

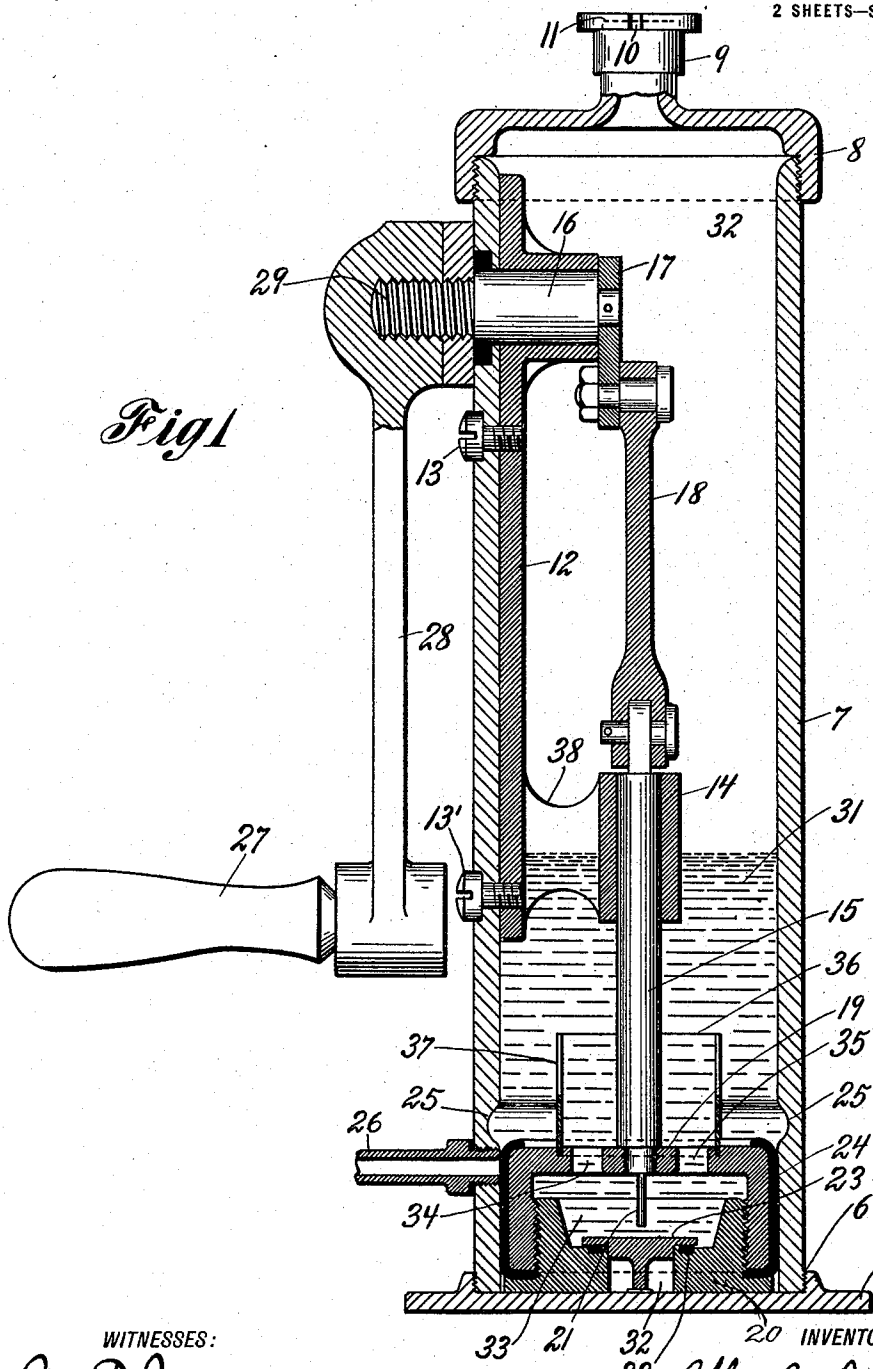
APPLICATION FILED JUNE 19, 1913.

1,147,221.

Patented July 20, 1915.

2 SHEETS—SHEET 1.

Fig 1



WITNESSES:

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2 SHEETS—SHEET 2.

Fig 3

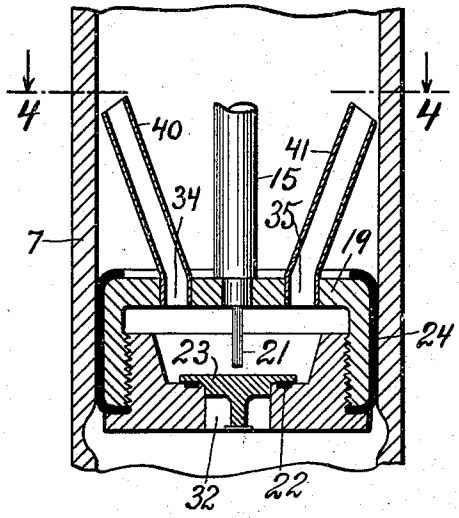
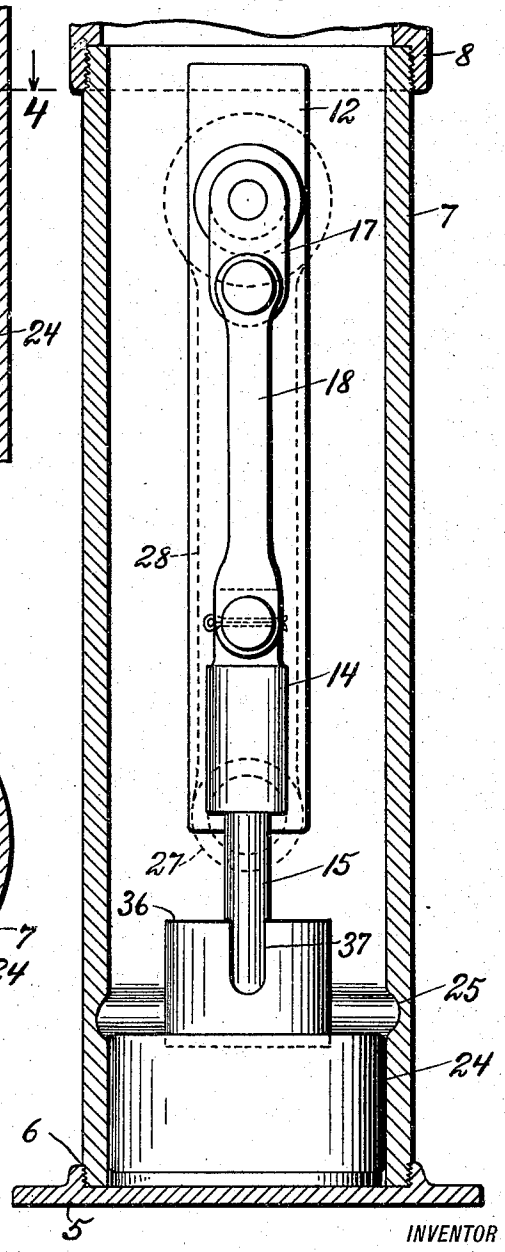


Fig 2



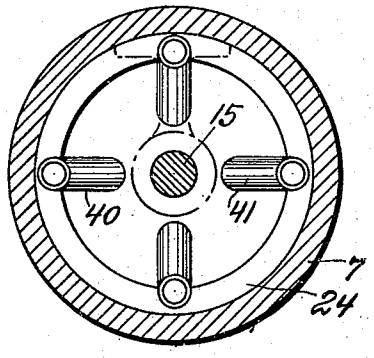


Fig 4

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UNITED STATES PATENT OFFICE.

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PUMP.

1,147,221. Specification of Letters Patent. Patented July 20, 1915.

Application filed June 19, 1913. Serial No. 774,561.

To all whom it may concern:

Be it known that I, ALLEN A. DITTMAR, a citizen of the United States, residing at El Mora, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Pumps, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in pumps and more particularly has especial reference to vacuum pumps adapted for producing high vacuums and for use in manufacturing what is known as artificial ice. With pumps for this purpose heretofore made it has been difficult to produce a high vacuum and such pumps have usually been characterized by several sets of valves the operation of which have proved to be more or less unsatisfactory for the purposes intended. In my present invention I employ only a single, simply constructed valve.

Referring to the accompanying drawings Figure 1 is a vertical transverse section with parts in full outline of a pump illustrating one application of my invention. Fig. 2 is a view partly in cross section at right angles to Fig. 1 with the upper part broken away. Fig. 3 is a broken cross section illustrating a modified form of attachment or shield for the piston, and Fig. 4 is a cross section on the line 4—4 of Fig. 3.

5 is the base of the pump or head of the cylindrical body portion to which it is suitably attached as by screw threads indicated by the reference character 6, the cylindrical body portion 7 having provided at its upper extremity another head 8 upon which may be screwed the cap 9 with the vent 10, the reference character 11 indicating a suitable cork which may be removed after shipment. Within the cylinder 7 is mounted a suitable bracket such as 12 which may be secured thereto by any suitable means such as the screws 13—13′, said bracket providing the guide 14 for the piston rod 15 and support for the crank shaft 16, carrying the crank 17 suitably secured thereto. The connecting rod 18 is suitably secured upon the crank 17 as shown and likewise to the piston rod 15 which it will be observed terminates in the piston head 19 which is provided with a depending section or base 20 screwed thereto, a suitable pin such as 21 being secured to or projecting from the inside of the piston head 19 or the shaft 15. The depending section 20 of the piston head it will be observed is provided on the inside with a suitable seating such as 22 upon which rests the foot valve 23. The circular packing 24 it will also be observed is secured at the bottom between the sections 19 and 20 of the piston and is of less diameter at the top so as to be securely held on the periphery of the piston as shown.

25 is an internal annular recess or cavity depressed or formed upon the interior of the cylinder 7 beyond which the piston travels, and 26 is an inlet adapted to be connected with the vessel or container to be exhausted.

27 is a suitable handle upon the end of the crank 28 which at the opposite end engages the screw terminal 29 of the shaft 16 mounted in the bracket 12 as shown and projecting through the side of the cylinder 7. The threads of the screw 29 engages the crank 28 in such a manner that the crank tends to bind itself upon the screw 29 when it is being turned rightwardly so that the operator by reversing the direction of rotation can readily remove the handle in the usual well known manner.

31 indicates oil or other suitable liquid intended for displacing, sealing and lubricating purposes as hereinafter more particularly set forth.

After shipment and when the cork 11 has been removed the cap 9 may be replaced thus allowing egress from the interior 32 of the cylinder 7 to the outer atmosphere. When the handle 27 is rotated the piston is reciprocated vertically within the cylinder 7. On the upstroke air is drawn through the connection 26 into the bottom of the cylinder 7 from the container to be exhausted and on the return stroke the inlet 26 is cut off by the piston and the air in the bottom of the cylinder lifts the little foot valve 23 within the lower portion 20 of the piston and escapes into the interior chamber 33 of the piston and out through the ports thereof 34 and 35, through the shield 36, percolating through the oil 31 into the interior 32 of the cylinder from which place it finally escapes through the vent 10 into the atmosphere. While the piston rises from its lowest point, oil 31 is imprisoned within the internal annular cavity or recess 25 and after the piston has passed said recess oil discharges therefrom under influence of gravity into the bottom

of the chamber 32 so that upon the return descent of the piston any air remaining beneath the piston naturally forms above this oil and strikes against the under face of the piston, lifting the little foot valve 23 and beyond which it is discharged with said remaining oil beneath the upper section of the piston, beyond the ports 34—35 and shield 36. This shield it will be observed has a cut away portion 37 to clear the bracket or arm 38 of the bearing 12 on the upward stroke of the piston.

In the modification shown in Figs. 3 and 4 it will be observed that the shield 36 is omitted and that tubes such as 40—41 are substituted. These communicate with the passages 34—35 so as to receive the oil and air discharged from beneath the piston on the down stroke and serve to throw the same against the interior walls of the piston cylinder. Either form of shield such as 36 or 40—41 will be found to serve substantially the same purpose, namely, to insure against any of the loose particles of air becoming secreted within the annular recess 25.

Of course it will be understood that the shield 36 or tubes 40—41 may be eliminated with more or less satisfactory results and various modifications may be made in the structure and arrangement of parts without any substantial departure from the spirit of the invention as herein claimed.

I claim:

1. In a pump of the class described, a piston and an outer cylinder therefor, a cavity adjacent to said cylinder adapted to be exposed when the piston is in one position and adapted to be closed when the piston is in another position, oil within said cylinder, and means in combination with said piston whereby said oil may be passed therethrough during the movement of said piston, some of said oil adapted to fill said cavity when the piston is in one position and adapted to be released therefrom when said piston is in another position and to be ejected through said piston by the movement of the same.

2. A pump of the class described comprising an outer cylinder, a piston and oil within the same, a valve within said piston, and a cavity within said cylinder adjacent to said piston adapted to be exposed when said piston is at either extreme position, the inlet to said pump being adapted to be exposed when said piston is at its upward extreme position.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ALLEN A. DITTMAR.

Witnesses:
LOUISE ENDERLE,
THOMAS A. HILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."