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GAS PUMP FOR REFRIGERATING APPARATUS, ETC

Original Filed March 27, 1920

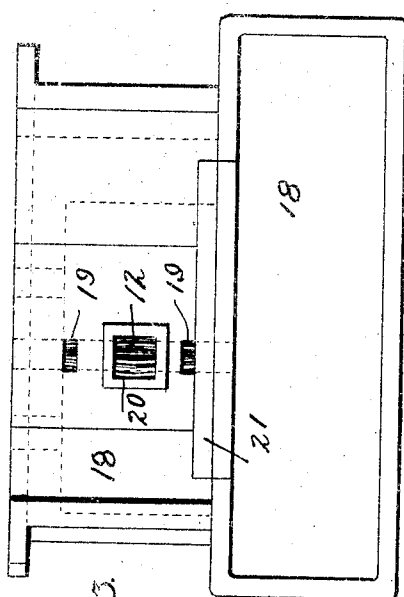


Fig. 3.

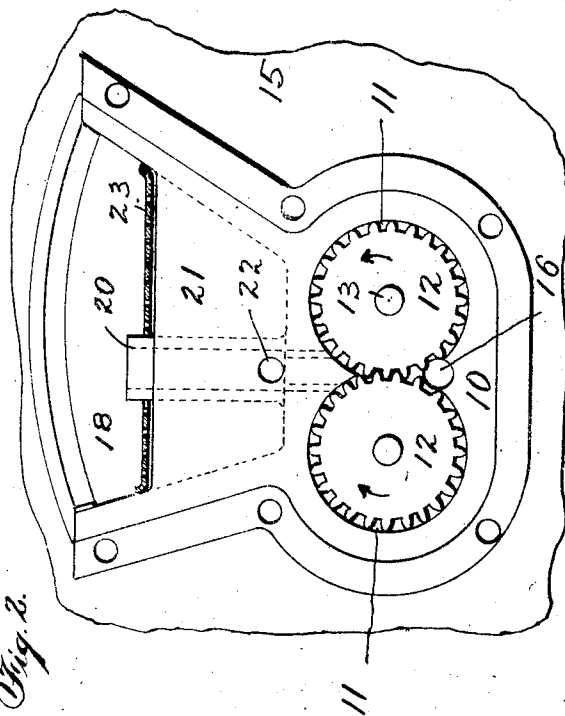


Fig. 2.

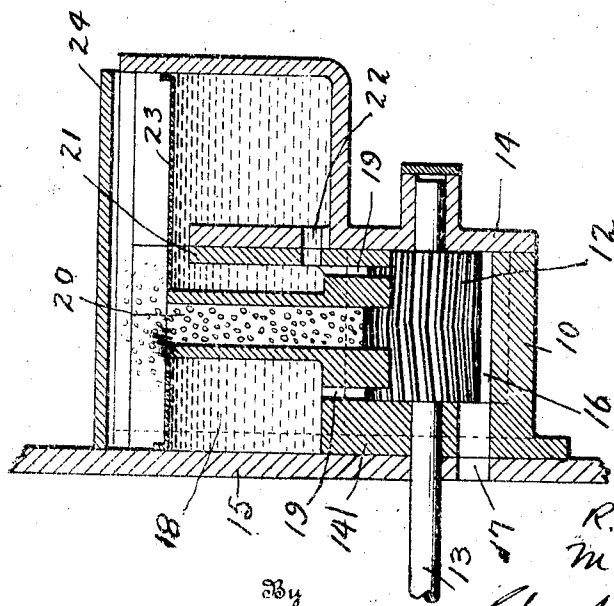


Fig. 1

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GAS PUMP FOR REFRIGERATING APPARATUS, ETC.

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To all whom it may concern:

Be it known that we, RAYMOND W. TIBBETTS and MYRON S. CURTIS, citizens of the United States, residing at West Roxbury, Massachusetts, and Pawtucket, Rhode Island, respectively, have invented certain new and useful Improvements in Gas Pumps for Refrigerating Apparatus, etc., of which the following is a specification, reference being had therein to the accompanying drawing:

Our invention has especial reference to refrigerating apparatus of the type having a rotary pump for compressing the refrigerant and an important object of our invention is to reduce to a minimum the amount of work the pump must do upon the oil or other liquid used for sealing and lubrication. Another object of our invention is to diminish to as short a time as possible the contact of gas and oil in the pump and thereby lessen the absorption of gas by the oil when the gas is soluble. Besides attaining these objects and advantages, our invention achieves other advantages, which will be appreciated by those skilled in the art, when the embodiment of our invention in its construction and operation is learned from the annexed drawing and the ensuing description. Our invention consists in such construction and relation of the parts as defined by or embraced within the language of the appended claims.

In the accompanying drawing, Fig. 1 is a vertical section through the pump mechanism of a refrigerating apparatus embodying our invention; Fig. 2 is a side elevation of the pump detached from the supporting wall of the chamber in which the pump is located; Fig. 3 is a top plan view with the cover for the oil tank or reservoir removed.

In the embodiment of our invention shown in the drawing, there is a gear case 10, bored with two cylindrical openings 11 that open into each other at one side in which are respectively mounted for revolution, intermeshing herring-bone gears 12, one of which is fixed to a shaft 13 that receives power from a suitable motor, not shown. At one end the gear chambers are closed by a wall 141 which is bolted to the casing 10 and at the other end by an integral wall 14 which lies next the wall 15 of the chamber of the refrigerating apparatus in which the pump is located. Directly below the point

where the two gears intermesh is a horizontally extending port 16, which aligns with a hole 17 in the wall 15 through which the gas to be compressed enters the port 16 and is taken up by the revolving gears.

Above the intermeshing gears, is a tank or reservoir 18, containing oil or other liquid, suitable for sealing and lubrication, from which at or near the end of the gears two ports 19 lead downward into the gear chambers and thus the liquid flows from the tank to the gears situated between said two ports, and extending upwardly from the gears at their longitudinal center is a port 20, that is prolonged so that it opens into the tank 18 at or near the top thereof, and into such port and driven upward there-through, is forced the mingled gas and liquid, separation of the oil and gas taking place in the upper part of the tank 18 above the normal liquid level therein. It will be seen that by the relative location of the liquid inlet ports 19 and the outlet port 20 but a small volume of the liquid requires to be acted upon by the pump and as the gas and liquid are mingled only for the short period required for their joint passage through the port 20, their contact exists only for a limited period of time.

The tank 18 has a vertical wall or partition 21 that terminates at the top just below the normal liquid level, so that in effect the tank consists of two chambers and oil or other liquid flowing from the top of the outlet 20, passes over the top of the partition 21 and finds its way back into the pump by way of a port 22 in the said partition 21 close to the bottom of the tank, such flow of liquid over the partition 21 aiding in the separation of the gas therefrom. To aid or promote the separation of the gas and liquid, a screen 23 may be placed just above the liquid level in the tank upon which the liquid falls after issuing through the port 20 above such screen. Over the top of the tank is a cover 24 that serves as a baffle plate and it may be set in place so loosely as to allow the escape of separated gas or it may be a tight fit and provided with a hole for the escape of gas from within the tank.

The gears rotate in the direction of the arrows applied thereto in Fig. 2 and their teeth are so arranged that they mesh first at the outside edges of the gears.

It is to be understood that while our pump

is especially advantageous as a part of refrigerating apparatus, we do not restrict ourselves to its use only in that connection but, include in the scope of our protection, its use in other relations consistently with the language or terms of our claims. By the term "gas", we include any aeriform fluid with which the pump may deal.

What we claim is:

10 1. A pump comprising a casing intermeshing gears mounted for rotation in such casing, a port for delivering gas to said gears and a liquid tank having liquid inlet and outlet passages establishing communication between the tank and the gears, said tank
15 having a vertical partition, terminating below the level of liquid in the tank.

20 2. A pump comprising a casing intermeshing gears mounted for rotation in such casing, a port for delivering gas to said gears

and a liquid tank having liquid inlet and outlet passages establishing communication between the tank and the gears, said tank having a vertical partition, terminating below the level of liquid in the tank, said partition being perforated at or near the bottom of the tank.

3. A pump comprising a casing, intermeshing gears rotatable in such casing, a port delivering gas to said gears, a liquid tank having inlet and outlet passages establishing communication between the tank and the gears, and a perforated baffle in the tank through which mingled liquid and gas from the gears is passed.

In testimony whereof we hereunto affix our signatures.

RAYMOND W. TIBBETTS.
MYRON S. CURTIS.