

T. R. VINZENT & F. C. BELL.
 ROTARY COMPRESSOR.
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983,010.

Patented Jan. 31, 1911.

Fig. 1.

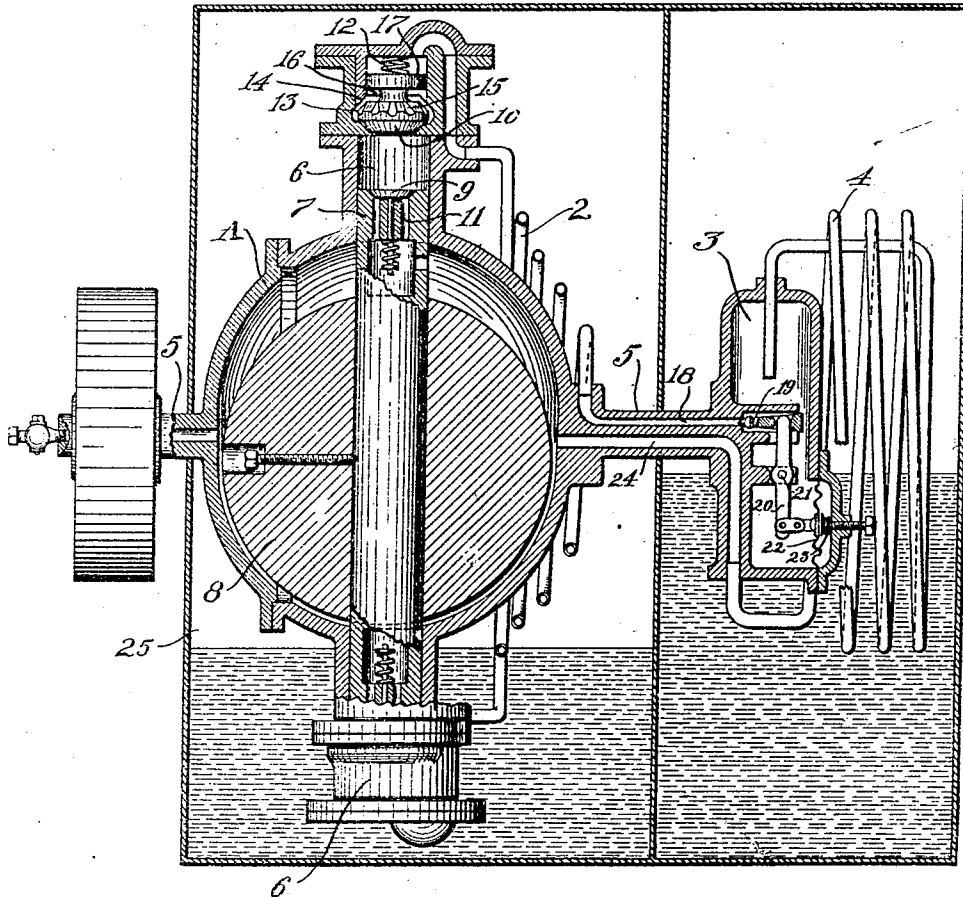
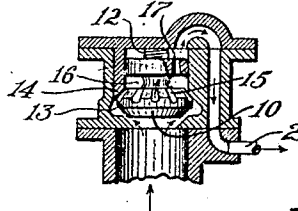


Fig. 2.



WITNESSES:

René J. Borge
F. E. Maynard

INVENTORS

THEODORE R. VINZENT
 AND
 FRED C. BELL

BY *Geo. H. Thong*

THEIR ATTORNEY

UNITED STATES PATENT OFFICE.

THEODORE R. VINZENT AND FRED C. BELL, OF ALAMEDA, CALIFORNIA.

ROTARY COMPRESSOR.

983,010.

Specification of Letters Patent. Patented Jan. 31, 1911.

Application filed December 14, 1908. Serial No. 467,401.

To all whom it may concern:

Be it known that we, THEODORE R. VINZENT and FRED C. BELL, both citizens of the United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Rotary Compressors, of which the following is a specification.

Our invention relates to rotary ice-machines, and means for producing a cooling or refrigerating atmosphere or effect.

Our object is to provide a simple, cheap, practical and economically-operated machine which is devoid of stuffing-boxes or open connections whereby the refrigerating liquid can escape, which is hermetically sealed, which can be operated by a novice, and which can be run either by hand or machinery.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is an elevation in partial section of the invention. Fig. 2 is a section of the outlet valve.

A represents a compressor of any suitable size, shape and material, 2 a combined condenser and receiver, 3 the evaporator or expansion chamber, 4 the expansion coil, and 5 a shaft whereon the aforesaid parts are mounted, and which shaft is suitably journaled and driven from any suitable source of power.

The chamber of the compressor is substantially ovoidal with the double opposed cylinders 6 in which the double acting piston 7 operates. This piston is gravity-actuated through the medium of the weight 8 carried by the piston and the rotary action of the compressor. Each cylinder has an inlet valve 9 carried by its respective piston, and a discharge valve 10. These valves are of any appropriate construction, and are so arranged that on each reciprocation of the piston member, gas from the compressor will be drawn into one of the cylinders 6 through suitable ports 11 formed in the piston and compressed and discharged from the other cylinder through its valve 10.

In order to prevent pounding of the piston, as in starting up the apparatus, or whenever there is an equalization of pressures on opposite sides of the inlet valves, we construct the outlet valve so that a comparatively slow escape of gas under pressure

in cylinder 6 will take place into the condenser 2. This cushioning effect of the piston may be accomplished in a variety of ways. As here shown, the outlet valve 10 acts against the spring 12 in its casing, whereby the valve is maintained normally closed independent of suction or fluid pressure. As the gas is compressed in a cylinder, its valve 10 opens, allowing the gas to escape into a passageway 13 in the valve casing, the valve being forced against an opposed seat 14. From the chamber 13 the gas escapes through suitable ports or grooves 15 in the valve into an annular space 16 formed by a turned-down portion of the valve. Thence the gas may escape through a restricted port 17 into the condenser receiver 2. The size of the ports 15—17 is such that an air cushion for the piston is formed in the cylinder 6; at the same time sufficient vapor will be delivered to the condenser receiver for refrigerant purposes. From the condenser receiver 2 the condensed gas and vapor passes through a port or conduit 18 formed in shaft 5, to the expansion chamber 3; the admission of the condensed vapor to the expansion chamber being regulated by suitable means, as the automatic needle valve 19. This regulating valve 19 may be operated by any appropriate means. As here shown, this valve is carried by a lever 20 fulcrumed at 21 and connected with a diaphragm 22, which latter is acted on by an adjustable tension spring 23 in opposition to the gas pressure in the expansion chamber. As the condensed vapor escapes into chamber 3 it expands and passes on through the coil 4, producing the desired degree of cold. From the coil 4 the expanded vapor returns to the compressor through a separate channel 24 formed in part through shaft 5.

Preferably the compressor revolves in a tank 25 containing a sufficient supply of water for cooling the compressor and receiver by the splash afforded by the cylinders as they pass through the water.

The evaporator and expansion coil are preferably contained in a separate tank or chamber, which tank may contain brine for freezing purposes, or the air to be chilled may pass directly through this chamber into the range of action of the freezing coil.

In operation, the device having been charged with a suitable refrigerant liquid or vapor, the apparatus is revolved at suitable

speed so that the piston will reciprocate twice at each revolution, by reason of the action of the weight 8, alternately drawing into one cylinder 6 vapor to be compressed and condensed, and discharging the same under compression from the opposite cylinder into the coil 2; the circulation taking place through the apparatus as previously described. The regulating valve 19 regulates the pressure and the amount of liquid carried in the evaporator coil.

An apparatus of this sort is very simple to operate, and can be installed at small expense, and is particularly useful in small plants, factories, shops, or hotels desiring to produce their own ice, or do their own refrigerating. It is also valuable for use on refrigerator cars, and the like.

Having thus described our invention, what we claim and desire to secure by Letters Patent is —

1. A rotary compressor comprising a horizontally mounted casing having an ovoidal chamber, cylinders fixed to the casing and extending radially therefrom, a double ended piston extending through said chamber and having its ends operating in opposed cylinders, inlet and outlet valve-controlled passages in the pistons and cylinders, and a weight fixed to the piston between its ends and inclosed by said chamber.

2. A rotary compressor comprising a horizontally mounted casing having an ovoidal chamber, cylinders fixed to the casing and extending radially therefrom, a double ended piston extending through said chamber and having its ends operating in opposed cylinders, inlet and outlet valve-controlled passages in the pistons and cylinders, a weight fixed to the piston between its ends and inclosed by said chamber, and a fluid tank in which the casing revolves, said cylinders adapted to rotate through the fluid of said tank and to be cooled thereby.

3. A rotary compressor comprising a casing having trunnions on opposite sides and upon which the casing is vertically revoluble, said casing having, also, an ovoidal chamber

with double opposed cylinders radiating therefrom, a single gravity-actuated double-ended piston traversing said chamber and operating in said cylinders, said piston having inlet and outlet passages; and a tank containing a cooling fluid in which the casing and cylinders are revoluble.

4. A rotary compressor comprising a casing having an ovoidal chamber with double opposed cylinders communicating with the interior of the casing, a single piston member common to both cylinders, and a weight on the piston within the casing to operate the piston, said cylinders having inlet and outlet passages.

5. A rotary compressor comprising a casing having an ovoidal chamber with double opposed cylinders communicating with the interior of the casing, a single piston member common to both cylinders, and a weight on the piston within the casing to operate the piston, said cylinders having inlet and outlet passages, and said inlet passage for each cylinder being formed in the piston and communicating with the interior of the casing.

6. A rotary compressor comprising a casing having an ovoidal chamber with double opposed cylinders communicating with the interior of the casing, a single piston member common to both cylinders, a weight on the piston within the casing to operate the piston, said cylinders having inlet and outlet passages, and said inlet passage for each cylinder being formed in the piston and communicating with the interior of the casing, and a valve in the outlet passage for said cylinder having means to cushion the movement of the piston in the cylinder.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

THEODORE R. VINZENT.
FRED C. BELL.

Witnesses:

CHARLES A. PENFIELD,
CHARLES EDELMAN.