J. C. CORBIN.

REFRIGERATING APPARATUS.

APPLICATION FILED MAR. 31, 1914.

1,144,642. Patented June 29, 1915.

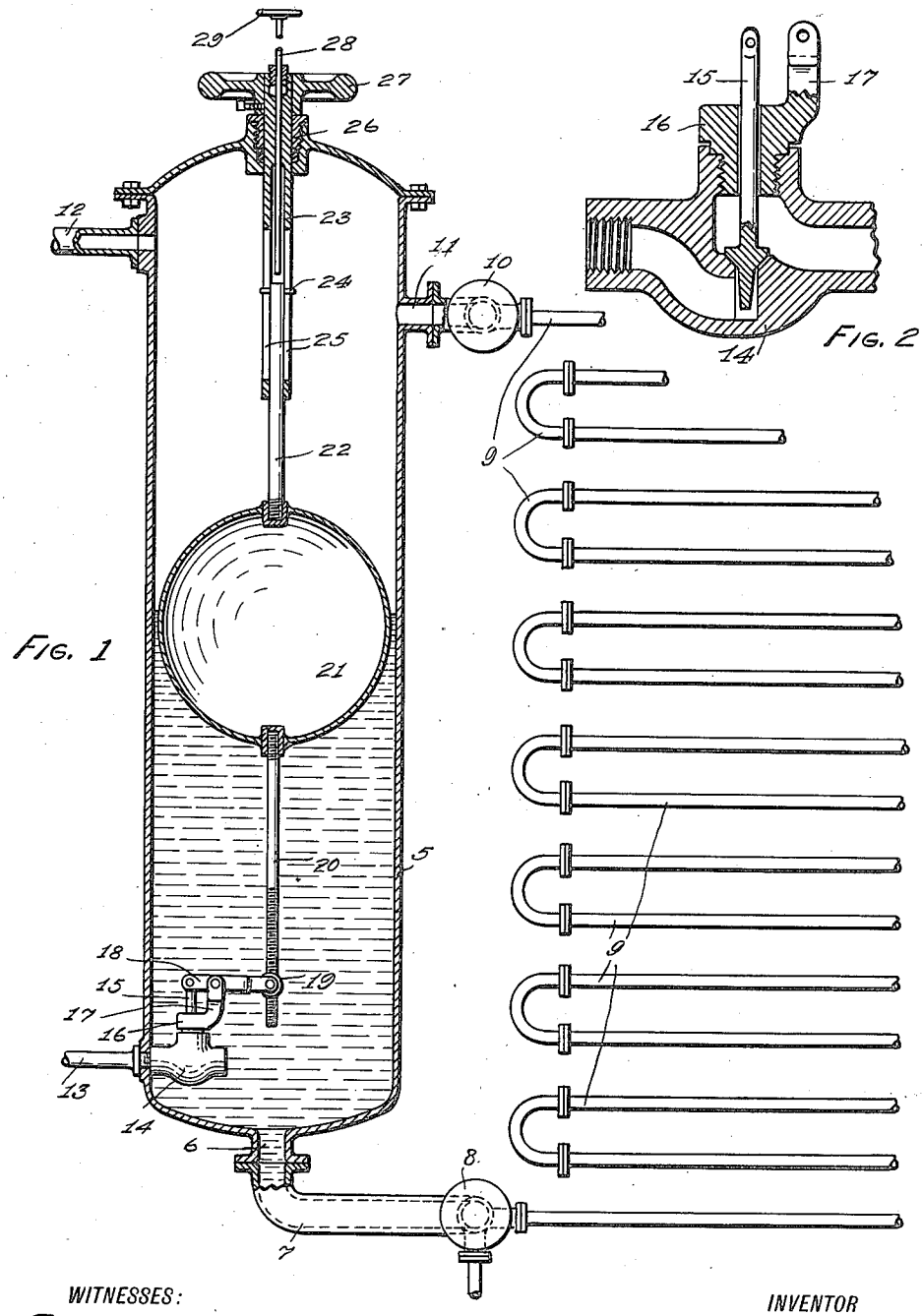


FIG. 1

FIG. 2

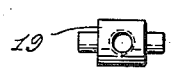


FIG. 3

WITNESSES:

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REFRIGERATING APPARATUS

1,144,642. Specification of Letters Patent. Patented June 29, 1915.

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To all whom it may concern:

Be it known that I, JOHN C. CORBIN, citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a certain new and useful Improvement in Refrigerating Apparatus, of which the following is a specification.

My invention relates to improvements in refrigerating devices that are adapted for use in cold storage warehouses, and the object of my improvement is to provide automatic means for regulating the extent of the active area of refrigerating surface that may be presented by a container of refrigerating liquor, as of ammonia, the extent of such active area being determined by the height to which such liquor may rise in said container. I accomplish this object by devices illustrated in the accompanying drawings in which—

Figure 1 is a view in vertical section of a refrigerating system embodying my invention, certain parts being shown in side elevation. Fig. 2 is a view in vertical mid-section of an expansion valve embodied in my invention, and Fig. 3 is an enlarged plan view of a detail of my invention.

Referring to the accompanying drawings, in which like reference numerals indicate like parts, 5 is a tank that is adapted to contain refrigerating liquid, as ammonia, which tank 5 is provided with an outlet connector 6 at its lower end to which is connected a header 8 by a pipe 7 to which header 8 may be connected the lower end of any suitably formed pipe coil 9 which coil 9 is disposed within the room or area that is to be cooled and which may be of suitable extent to provide the desired amount of cooling surface, its top end being connected with another header 10 which is connected by a pipe 11 with the upper portion of the tank 5 whereby liquid refrigerating liquor may be admitted to such pipe coil 9 and therewithin act in a well known manner to absorb the heat from the space surrounding such pipes, the ammonia vapor passing from the coil 9 through the pipe 11 into the upper portion of the tank 5 from which it is drawn off through a pipe 12 by a suitable pump (not shown) to a compressor (not shown) where it may again be liquified and returned under a high pressure through an inlet pipe 13 and an expansion valve 14 to the tank 5, the height to which such liquor is permitted to rise in the tank 5 and the pipe coil 9 governing the amount of cooling surface that such coil 9 will present and such height being governed by the regulation of the valve 14.

The expansion valve 14, more clearly shown in Fig. 2, is of the usual form of construction, except that the valve stem 15 is slidably disposed in the valve cap 16 instead of being screwed therein, and the valve cap 16 is formed with an integral bracket 17 which serves as a fulcrum for a lever arm 18 that has one end articulated by a pivot 19 with the top end of the stem 15, whereby such stem 15 may be moved upwardly and downwardly by movement of such lever arm.

The outer end of the lever arm 18 is provided with a rotatably mounted swivel nut 19 into which is screwed a threaded shaft 20 that is secured to the bottom side of a float 21, such float 21 having another shaft 22 secured into the top side thereof at a point opposite to the point of attachment of the shaft 20, the top end of which shaft 22 is adapted to extend upwardly into a hollow pipe 23 and is provided with a cross pin 24 that is adapted to slide in slots 25, 25 that are provided in opposite sides of the pipe 23, such nut 19 serving to prevent the shaft 22 from turning within the pipe 23 or from being entirely withdrawn therefrom.

The hollow shaft or pipe 23 extends upwardly through a stuffing box 26 that is provided in the top side of the tank 5 and is provided on its top end at a point outside of the tank 5 with a hand wheel 27 by which it may be turned to screw the shaft 20 upwardly or downwardly in the swivel nut 19 to regulate the height of the float 21.

A thrust pin 28 having a hand hold 29 on its top end is provided to project upwardly through the hollow shaft 23 and is adapted to be pushed downwardly to lower the float and open the valve 14 in case it is desired to do so.

In the operation of my device, liquor under high pressure is admitted through the pipe 13 and the valve 14 into the tank 5 and is permitted to rise in such tank and in the pipe coil 9 until the liquor in the tank 5 reaches a sufficient height to lift the float 21 enough to move the outer end of the lever arm 18 upwardly and by moving the valve stem 15 downwardly to close the valve 14, the height to which such float will permit the liquor to rise being regulated by turning the hand wheel 27 to screw the shaft 20 upwardly or downwardly in the

swivel nut 19 to regulate the height of the float 21, the pin 24 being adapted to move vertically in the slots 25, 25.

If the liquor in the tank 5 is raised sufficiently to close the valve 14 and then such liquor be lowered by evaporation in the pipe coil 9 the float 21 will be lowered and by its downward movement will open the valve 14 to admit more liquor to such tank, the liquor thus being automatically maintained at a certain predetermined height which height may be regulated by raising or lowering the float 21 and the height at which such liquor is maintained in the pipe coil 9 will regulate the temperature at which the atmosphere surrounding such coil 9 is maintained.

What I claim is:

1. In a refrigerating device, the combination with a tank provided in its bottom with an inlet for a refrigerating liquid and in its top with an outlet for vapor, of an expansion valve arranged in the inlet, a refrigerating coil connected with the tank, a lever arm connected with the expansion valve, a nut rotatably mounted to extend cross-wise of the outer end of the lever arm, a shaft arranged to screw through the nut, a float secured to the shaft, a stud arranged to project upwardly from the float and having a cross pin in its upper end, and a slotted pipe arranged to extend downwardly through the top of the tank to guide the stud.

2. In a refrigerating device, the combination with a tank provided in its bottom with an inlet for a refrigerating liquid and in its top with an outlet for vapor, of an expansion valve provided in the inlet, a refrigerating coil connected with the tank, a lever arm connected with the expansion valve, a nut rotatably mounted to extend crosswise of the outer end of the lever arm, a shaft to screw through the nut, a float secured to the shaft, a stud to project upwardly from the float, and having a cross pin at its upper end, a slotted pipe to extend downwardly through the top of the tank to guide the stud, the cross pin being adapted to fit within the slot whereby the float may be caused to turn with the slotted pipe, and mean for turning the pipe whereby the height of such liquid may be governed.

In witness whereof, I hereunto subscribe my name this 19th day of March A. D., 1914.

JOHN C. CORBIN.

Witnesses:
FRANK WARREN,
F. C. MATHENY.