No. 745,499. PATENTED DEC. 1, 1903.

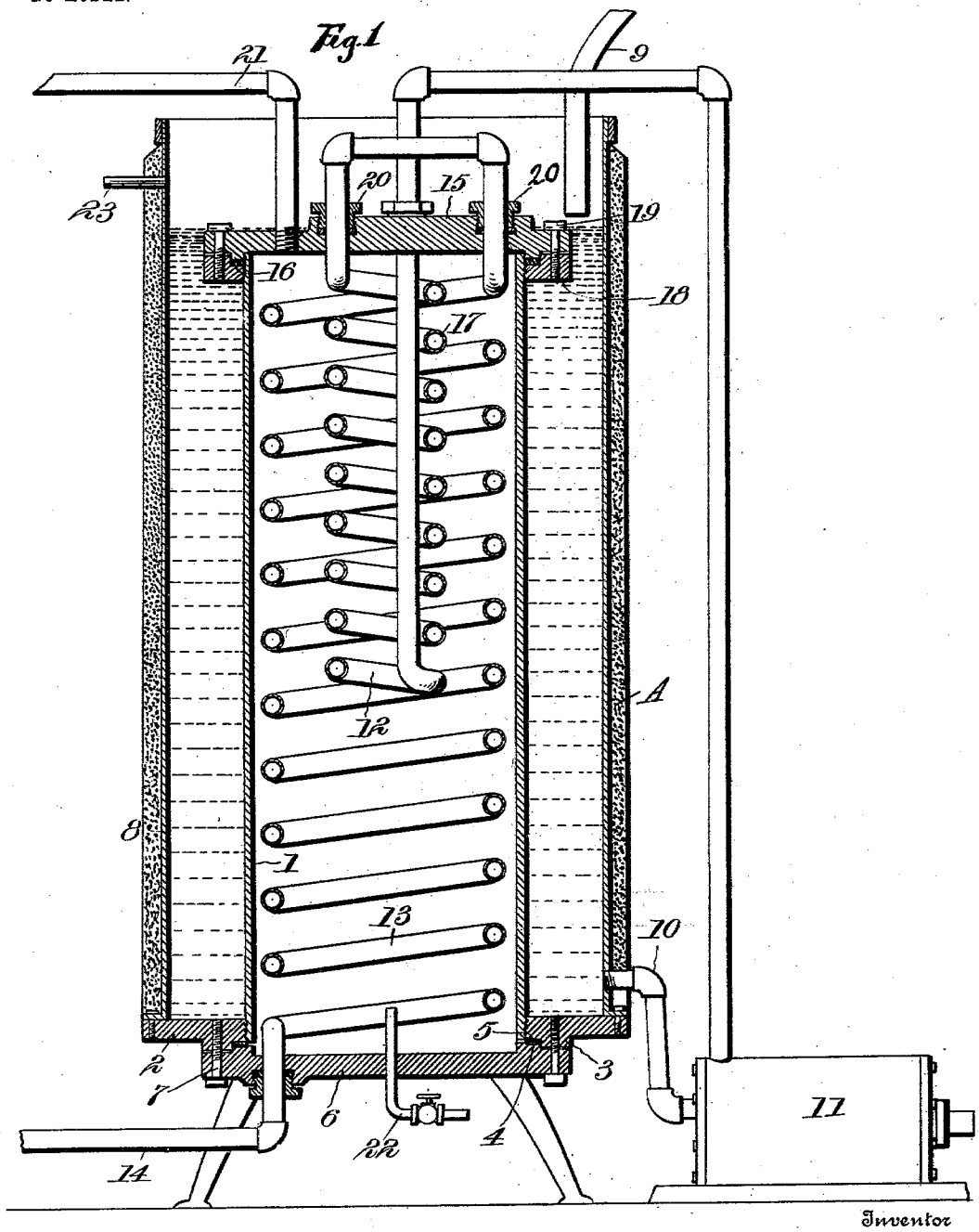
G. R. JARMAN.

HEAT INTERCHANGER.

APPLICATION FILED JUNE 4, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



Witnesses

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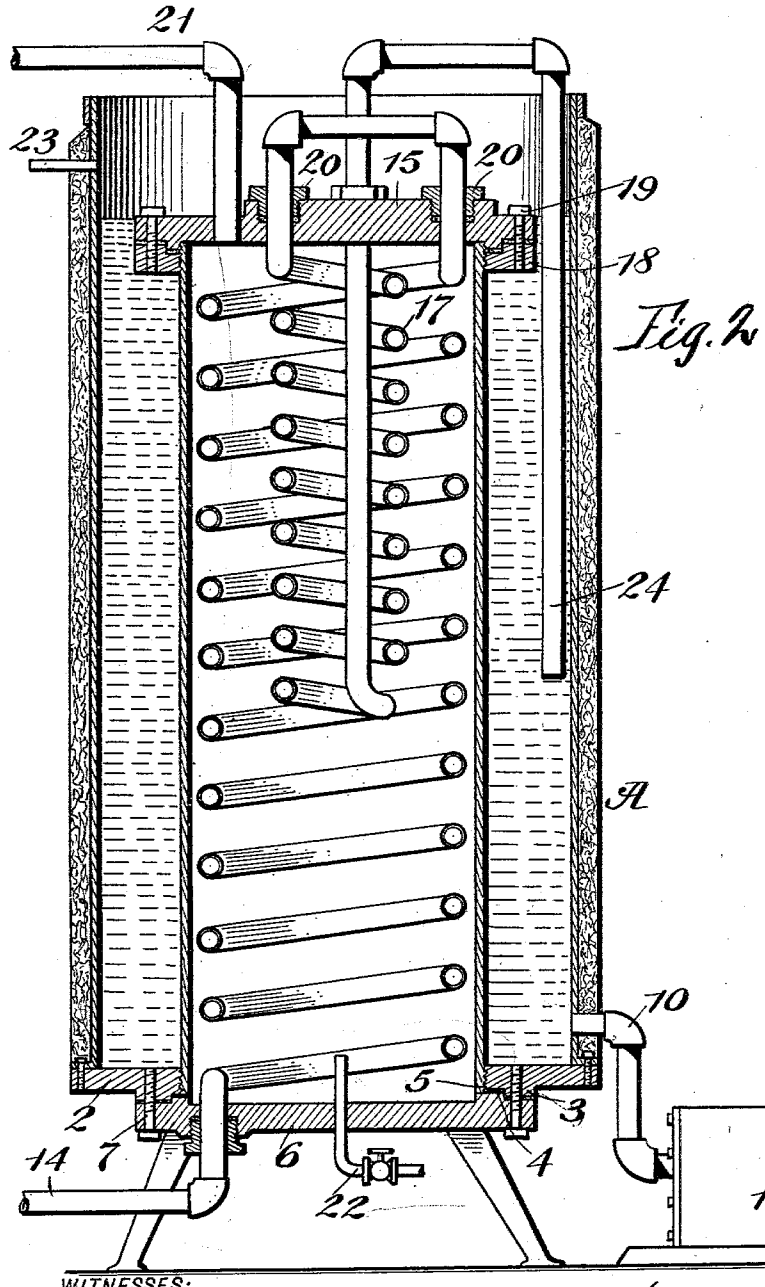


Fig. 2.

WITNESSES:

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No. 745,499. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

GEORGE R. JARMAN, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO S. H. JARMAN, OF BALTIMORE, MARYLAND.

HEAT-INTERCHANGER.

SPECIFICATION forming part of Letters Patent No. 745,499, dated December 1, 1903.

Application filed June 4, 1902. Serial No. 110,237. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. JARMAN, a citizen of the United States of America, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Heat-Interchangers, of which the following is a specification.

My invention relates to refrigeration; and it has relation particularly to a condenser or brine-cooler to be used in refrigerating and ice-producing apparatus.

One object of the invention is to produce a brine-cooler which will utilize the refrigerated liquid returning from the circulation-coils as an agent for reducing the temperature in the main tank.

Furthermore, the object of the invention is to produce a condenser or brine-cooler which will possess advantages in points of efficiency and simplicity proving efficient and satisfactory in use and comparatively inexpensive.

With the foregoing and other objects in view the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail reference will be had to the accompanying drawings, forming part of this specification, wherein like characters denote corresponding parts in both views, and in which—

Figure 1 is a sectional view of an apparatus to be used as a brine-cooler. Fig. 2 is a similar view showing it employed as a condenser.

In the drawings, 1 indicates a pipe which has a flange-ring 2 threaded on its lower end, said flange having a rib 3, which forms a shoulder 4, against which a jacket 5 is seated. The base-plate 6 is suitably supported and has bolts 7 run therethrough and threaded into the flange.

In a brine-cooler a jacket 8 has its lower end secured to the flange and surrounds the pipe, with an intervening space forming a tank for the reception of the discharge from the return-pipe 9, leading from the coils used for conducting the refrigerant agent through a building or freezing-tank. The liquid in the tank is drawn off through the pipe 10 by the pump 11 and is forced into the auxiliary coil 12, which extends a suitable distance into the pipe in order that the temperature may be reduced before it enters the brine-coil 13, said coil discharging through the pipe 14 to the piping of the cold-storage building or ice plant. The head 15 of the pipe 1 has a rib 16, which rests on a gasket 17, fitted in the groove of the flange 18, said flange being screwed to the pipe 1. The head 15 is secured to the flange by the bolts 19. Packing-nuts 20 are threaded in the head of the brine-cooler around the several pipes for insuring tight joints. The suction-pipe 21 to the compressor is tapped into the head of the pipe, and the expansion-inlet 22 extends through the base and terminates a suitable distance from the bottom in order that it may discharge above the very cold strata in the bottom of the brine-cooler.

By jacketing the brine-cooler in the manner shown and utilizing the return liquid from the pipes absorption of heat by the brine-cooler is prevented and the return liquid is utilized. I may also provide an insulation-covering A for the jacket to prevent radiation from the tank.

The operation of my invention is as follows: When used as a brine-cooler, the liquid gas is expanded from valve 22 into the chamber 1, and there expands around coils 12 and 13, absorbing the heat from the non-congealable fluid circulating in coils 12 and 13, and the expanded gas is then taken by suction to compressors through pipe 21 and is recompressed and delivered to condenser to be used again. In the circulation of the non-congealable liquid to be reduced to a low temperature the circulation is as follows: The liquid from the pipes in the rooms or from the ice-tank is delivered into the space between the inner and outer shells of the brine-cooler and is taken from outlet 10 and by means of some mechanical agent is delivered to coil 12, thence to coil 13, and is discharged from coils at 14 and is delivered to coils in room to be refrigerated or to tank where ice is to be made. The pipe 12 is coiled and extends into the pipe 1 in order that the gases in the pipe may act on the contents of the pipe 12 before said contents is delivered to the coil 13. When used as a condenser, the

cooling-water is introduced into the coils at 14, thence into coil 13, and from coil 13 to coil 12, and from coil 12 it discharges into jacket through the pipe 24, and it passes out of jacket at 23. The recompressed gas is delivered from the compressors to pipe 1 by means of discharging-pipe 21 and by the agency of the cooling agent circulation through coils 12 and 13, is cooled to as near normal temperature as possible, and is then collected into lower part of the cylinder 1 in a liquid state, and is conducted to brine-cooler to be used as a refrigerating agent by pipe and expansion-valve 22.

The construction, operation, and advantages, it is thought, will be understood from the foregoing description, it being noted that various changes may be made in the proportions and details of construction without departing from the scope of the invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a device of the character described, a base-plate provided with apertures suitably supported, a flange having a rib forming a shoulder and interiorly threaded, bolts for securing the flange-ring to the base, a cylinder exteriorly threaded a predetermined distance at each end and threaded into the flange-ring secured to the base, a jacket having a flange extending outward at right angles to its sides formed integral with the jacket, means for securing the jacket to the flange-ring, a second-named flange-ring interiorly threaded and provided with a groove in its upper surface, threaded on the upper end of the cylinder, a head having apertures and provided with a rib on its lower surface, said rib fitting the groove of the second-named flange-ring whereby a tight joint is provided and means for securing the head to the flange-ring, a pipe formed in a coil extending the inner length of the cylinder and through the head to the exterior of the cylinder thence entering the cylinder diametrically opposite from the place of exit and formed in an inner coil extending a predetermined distance of the cylinder thence bent back and extending through the center of the inner coil through the head to the exterior of the cylinder, a pump, suitable connections for the pump and an outlet and an inlet pipe as and for the purpose specified.

In testimony whereof I affix my signature, in the presence of two witnesses, this 31st day of May, 1902.

GEORGE R. JARMAN.

Witnesses:
FRANK E. RAPP,
FRANK S. APPLEMAN.