April 13, 1937. R. J. SIMARD 2,076,922

AIR COOLING SYSTEM FOR PIPE LINES

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Fig. 1

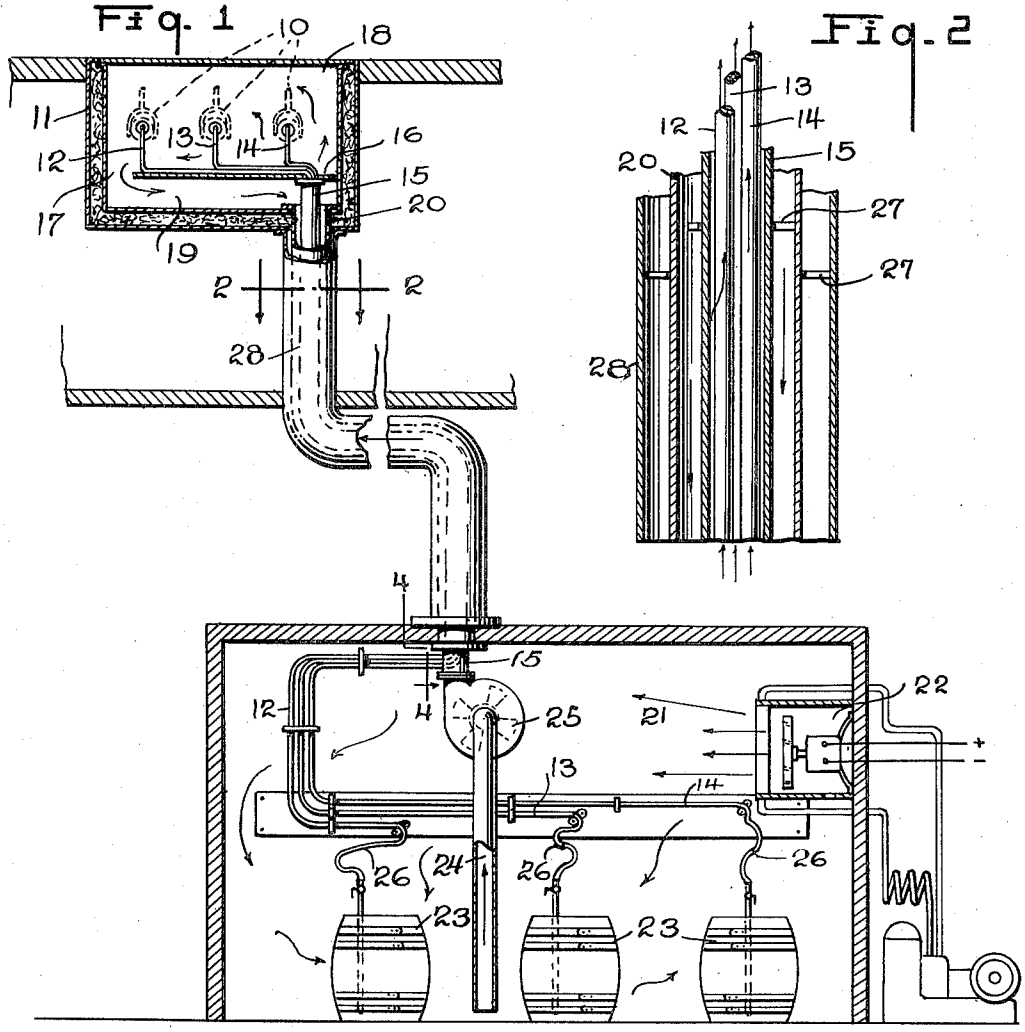
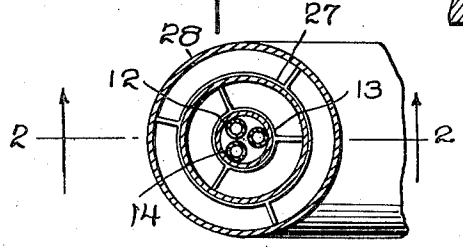


Fig. 2

Fig. 3



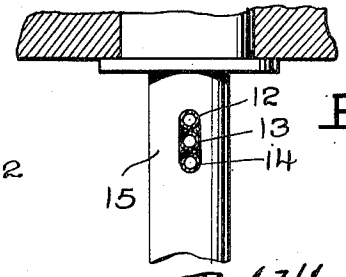


Fig. 4

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AIR COOLING SYSTEM FOR PIPE LINES

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6 Claims. (Cl. 225—1)

This invention relates to improvements in cooling systems and is especially adapted for use in liquid delivering systems wherein it is desirous of delivering a cooled liquid from a remote supply over a considerable distance to a point of discharge and at the same time maintain its cold temperature throughout the system.

Heretofore, in systems of this character, it has been found to be very expensive to insulate a liquid dispensing pipe for a considerable distance from a source of supply to a point of delivery, owing to the cost of the insulating material and the workmanship required to cover the piping throughout its area, but in the present invention there is shown a system wherein the desired results are obtained in a simple and inexpensive manner. Therefore the principal object of this invention is to provide a system of the kind described which will be inexpensive to install and be highly efficient in operation.

This object and others hereinafter set forth are attained by the means illustrated in the accompanying drawing, in which

Fig. 1 is a view of a liquid dispensing system, partly in section, showing both the supply and delivery ends of the system;

Fig. 2 is a longitudinal sectional view of a portion of the insulated pipes taken on the line 2—2 of Fig. 3;

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1; and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1.

Similar reference numerals in all of the figures of the drawing designate like parts.

The drawing shows a representation of a system for dispensing a beverage from a series of faucets 10 which project through a front wall of a cooling tank 11 wherein are made the pipe connections to the faucets. In the present instance only three faucets 10 are shown and three pipe lines 12, 13 and 14, but it is understood that the number of faucets and pipe lines can be varied to more or less as the necessity arises.

These pipes 12, 13 and 14 extend from the faucets 10 to and through a pipe cooling conduit 15 whose upper end is connected in any suitable manner to a horizontal partition 16 positioned above the floor of the tank 11 and so constructed to provide an air escape opening 17 preferably located at one side of the tank to permit the passage of cooled air from the upper compartment 18 of the tank to a lower compartment 19 for a purpose herein set forth.

Cooling tank 11 preferably has insulated walls, and suitably secured to the bottom thereof is an air return pipe 20 whose upper end is open to receive the air from the lower compartment 19 and permit it to descend to a refrigeration chamber 21 through its lower open end which is suitably secured to the top wall of said chamber.

Refrigeration chamber 21 is preferably cooled by a suitable refrigerating apparatus 22 and in this chamber is stored the liquid holding receptacles, such as kegs 23 or the like, and from which is drawn the beverage that is supplied to the faucets 10. The entire area of the chamber 21 is suitably cooled and cold air is drawn therefrom at or near its bottom by a pipe 24 which is connected to a suitable fan 25 which sucks the air from the bottom of the cooling chamber through the pipe 24 and forces the cold air through the cooling conduit 15 and thereby cools the pipes 12, 13 and 14 and the contents contained therein.

Each of the pipes 12, 13 and 14 is connected in the usual manner to the supply receptacles 23 by suitable flexible connections 26 and enter the cooling conduit 15 at one side thereof as plainly shown in Fig. 4 of the drawing.

Suitable spacing means such as spiders 27 are arranged in the separate pipes of the system to maintain them in proper position relative to each other.

As a further precaution of protecting the cooling pipes from heat, a dead-air-pipe or tube 28 is used to cover the exposed portions of the cooling pipes, that is, those portions which extend from tank to tank or chamber as clearly shown in Fig. 1 of the drawing.

In operation, the refrigerating apparatus 22 lowers the temperature in tank or chamber 21 and the fan or pump sucks the cold air from the bottom of said chamber and forces it through the pipe 15 and around the liquid dispensing pipes 12, 13 and 14. These dispensing pipes and contents are cooled primarily in the chamber 21 where they are exposed to cold temperature; thus the dispensing pipes are maintained cold throughout their entire length, and as the cold air in pipe 15 discharges into the upper compartment of the discharge tank 10, said tank is maintained cold, which effectually cools the liquid in the faucet pipes. Hence the liquid served from the faucets will be of a proper temperature to secure the most favorable results. The cold air, after cooling the faucet connections in the upper compartment 18, descends into the lower compartment 19, passes through the pipe 20 and continues its passage, discharging into the tank or

chamber 21 where it is re-cooled to be used again through pipe 15. Thus the cold air is used to cool the pipes 12, 13 and 14 and their contents, also the faucet tank 10, and is further used on its passage to the chamber 21 to provide a cold insulation for the pipes 15, 12, 13 and 14.

It has been found that the above described system is most economical to install and that the distance between the supply tank and the serving tank can be unlimited without appreciable loss of cooling temperature.

Having thus fully described the invention, what is claimed is:—

1. In a system of the type described, a main cooling chamber having a refrigerating apparatus for cooling the same, a cooling tank located a distance from said main cooling chamber, a liquid conveying pipe line connecting said cooling chamber and said cooling tank, a cooled air conveying pipe line surrounding the liquid pipe line and extending from the chamber to the tank to maintain the liquid pipe line cold, pipe means surrounding said cooled air conveying pipe line for returning the cold air from the tank to said chamber, and means for forcing the cold air from the chamber through the air conveying pipe surrounding the liquid pipe line to said cooling tank.

2. In a system of the type described, a main cooling chamber having a refrigerating apparatus for cooling the same, a cooling tank located a distance from said main cooling chamber embodying an upper and a lower compartment, a liquid conveying pipe line connecting said cooling chamber and said cooling tank, a cooled air conveying pipe line surrounding the liquid pipe line and extending from the chamber to the tank to maintain the liquid pipe line cold and having one end connected to said upper compartment, pipe means surrounding said cooled air conveying pipe line for returning the cold air from said lower compartment of the tank to said chamber, and means for forcing the cold air from the chamber through the air conveying pipe surrounding the liquid pipe line to said cooling tank.

3. In a system of the type described, a main cooling chamber having a refrigerating apparatus for cooling the same, a cooling tank located a distance from said main cooling chamber embodying an upper and a lower compartment, a liquid conveying pipe line connecting said cooling chamber and said cooling tank, a cooled air conveying pipe line surrounding the liquid pipe line and extending from the chamber to the tank to maintain the liquid pipe line cold and having one end connected to said upper compartment, pipe means embodying a return-air-pipe surrounding said air conveying pipe line and having open ends connected to said cooling tank and cooling chamber respectively for returning the cold air from said lower compartment of the tank to said chamber, and means for forcing the cold air from the chamber through the air conveying pipe surrounding the liquid pipe line to said cooling tank.

4. In a system of the type described, a main cooling chamber having a refrigerating apparatus for cooling the same, a cooling tank located a distance from said main cooling chamber, a liquid conveying pipe line connecting said chamber and tank, a cooled air conveying pipe line surrounding the liquid pipe line and extending from the chamber to the tank to maintain the liquid pipe line cold, said cooling tank being provided with a horizontal partition forming an upper compartment and a lower compartment, said partition having an opening at one side to permit air to pass from the upper to the lower compartment, pipe means surrounding said air conveying pipe line for returning the cold air from the tank to said chamber, and means for forcing cold air from the chamber through said air conveying pipe line to said cooling tank.

5. In a system of the type described, a plurality of cooled liquid conveying pipes extending from a cooling chamber to a remote cooling tank, said pipes being surrounded a portion of their length by a cold air conveying pipe, a return cold air pipe surrounding said cold air conveying pipe from said cooling tank to said cooling chamber to provide a cold air insulation for said surrounded pipes, and means for creating a continuous circulation of the cold air through said conveying and return pipes and also through said cooling tank and cooling chamber

6. In a system of the type described, a plurality of cooled liquid conveying pipes extending from a cooling chamber to a remote cooling tank, said pipes being surrounded a portion of their length by a cold air conveying pipe, a return cold air pipe surrounding said cold air conveying pipe from said cooling tank to said cooling chamber to provide a cold air insulation for said surrounded pipes, and means for creating a continuous circulation of the cold air through said conveying and return pipes and also through said cooling tank and cooling chamber, and a dead air insulating pipe surrounding said return air pipe and extending the entire distance between said cooling chamber to said remote cooling tank.

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