May 26, 1959 C. M. HEATHMAN 2,888,252

HEAT EXCHANGER FOR MAINTAINING A DRY WALL STRUCTURE FOR REFRIGERATION SYSTEMS

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FIG. 1

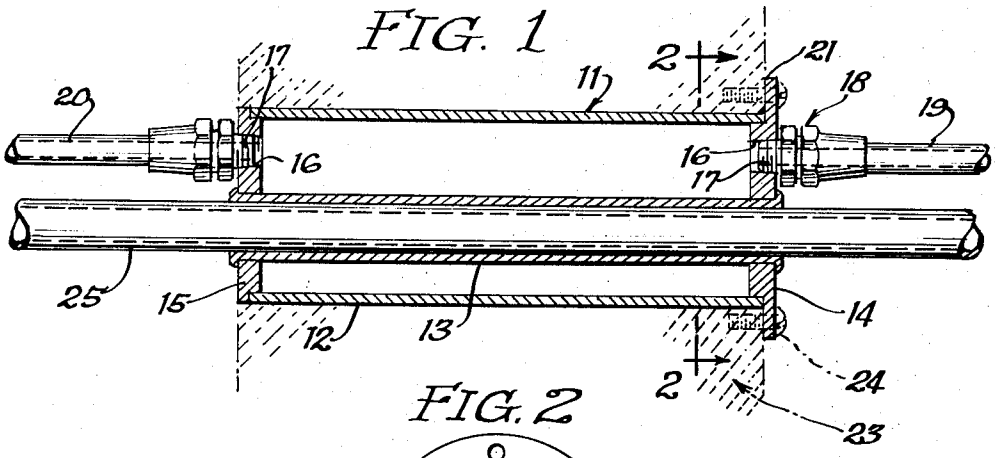


FIG. 2

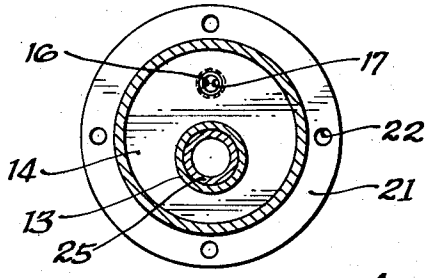


FIG. 3

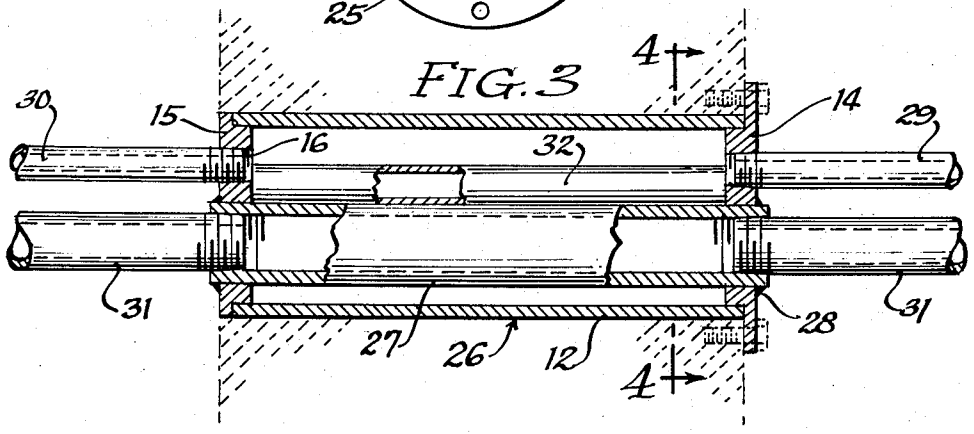
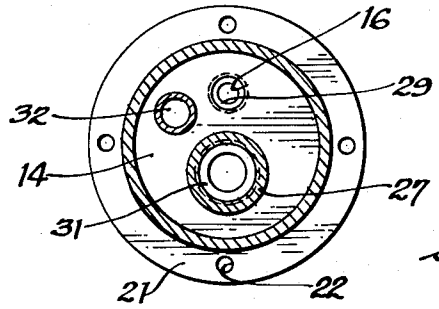


FIG. 4



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HEAT EXCHANGER FOR MAINTAINING A DRY WALL STRUCTURE FOR REFRIGERATION SYSTEMS

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1 Claim. (Cl. 257—241)

This invention relates in general to refrigeration or air conditioning systems, and more particularly to a novel tubing assembly adapted to be mounted in and extend through a wall or partition of a building or appliance to accommodate the passage of the refrigeration lines therethrough.

A principal object of the invention is to prevent damage to a wall structure through which the low temperature line of a refrigerating system passes, which normally results from condensation of moisture on the exterior surface of the line, by eliminating such moisture condensation.

Another important object of the invention is to facilitate penetration or passage of refrigeration lines through a wall or partition of a structure at any time, either during construction of the latter or after it has been completed, which is accomplished by means of the novel tubing assembly hereinafter described in detail.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings:

Figure 1 is a sectional view taken longitudinally through one form of dry-wall pass through tubing assembly embodying the features of my invention;

Fig. 2 is a vertical section taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a longitudinal section, similar to Fig. 1, of a modified form of tubing assembly; and

Fig. 4 is a vertical section taken substantially on the line 4—4 of Fig. 3.

Referring more particularly to Figs. 1 and 2, the dry-wall pass through tubing assembly therein illustrated and designated generally by reference numeral 11 comprises an outer tube or cylinder 12, an inner tube or conduit 13, and end header member or plates 14 and 15. Any suitable material may be employed for these members, but it is preferred that they be made of a non-ferrous metal. They may be secured together to form a unitary assembly in any desired manner so as to insure against leakage. As best seen in Fig. 1, this may be accomplished by providing each of the end plates 14 and 15 with reduced inner portions of substantially the same diameter as that of the interior of the outer cylinder 12 for tightly engaging therein, and suitably securing these parts together by brazing or soldering. Each of the end plates 14 and 15 is provided with an eccentrically disposed aperture for slidingly receiving the inner tube 13, and the latter is secured to the end plates in any suitable manner, as by having its outer ends spun over, or by soldering, brazing, or the like. With such an arrangement, the inner tube 13 and its attachments to the end plates 14 and 15 materially assist in preventing separation of the end plates from the outer cylinder 12 and in maintaining leak proof connections therebetween. The particular importance of such construction will better be

understood from the following description which specifically details the intended use of this assembly as having the outer cylinder 12 interconnected into the high pressure or liquid discharge line of a refrigerating system.

Each of these header members or end plates 14 and 15 also is provided with an eccentrically located aperture 16 which preferably is tapped to receive the tapered, pipe-threaded end of a nipple 17 forming part of a standard union or pipe fitting connection 18 for attaching the end of a copper tube, or the like, 19 or 20 thereto. The header member 14 preferably has an annular flange portion 21 of greater diameter than the cylinder 12 with suitable apertures 22 to facilitate mounting of the tubing assembly 11 in a wall or partition 23 of a building or appliance, as by means of screws or bolts 24 (Fig. 1). The flange portion 21 of the end plate 14 preferably is secured to the outer surface of the wall 23 so as to also cover or overlie and protect the outer end of the aperture in the wall through which the tubing assembly 11 extends. It will readily be appreciated that this greatly facilitates mounting of the tubing assembly to extend through an existing wall or partition. At the same time, if the tubing assembly 11 is mounted in a wall, during its construction, for future use in accommodating passage of refrigeration lines through the wall, the apertures 16 and ends of conduit 13 may be closed with suitable temporary and removable plugs which, together with the flange 21, will effectively seal the tubing assembly and maintain a solid wall structure until such time as the assembly is to be used. It will also be appreciated that the tubing assembly 11 is adapted for use in connection with any type of wall or partition structure, such as wood, plaster-finished, insulated or non-insulated, tile, metal-sheathed, concrete, brick, etc.

In any installation, the tubing assembly 11 should extend completely through the wall or partition. When so mounted, and after removal of the temporary plugs from the apertures 16 and ends of conduit 13, if such had been used, the outer cylinder 12 is interconnected into the liquid or discharge line of the refrigeration or air conditioning system, comprising the tubes 19 and 20, in well-known manner, by means of the nipples 17 and fittings 18, as illustrated in Fig. 1. The inner tube 13 then is used as a conduit for the suction or refrigerant vapor line 25, the inner diameter of conduit 13 preferably being such as to slidingly receive tube 25 so that these two tubes are in substantial physical contact with each other.

In Figs. 3 and 4 a modified tubing assembly, indicated generally by reference numeral 26, is illustrated which is substantially the same as that shown in Figs. 1 and 2 and comprises the same outer tube or cylinder 12 connected in similar manner at its ends to header or end plates 14 and 15 like those in the previously described assembly 11. Each of the end plates 14 and 15 of the tubing assembly 26 is provided with an eccentrically disposed aperture for receiving an inner tube 27, which is similar to the previously described inner tube 13 and, like the latter, is secured at its ends in any suitable manner to the header members 14 and 15, as by welding or brazing as indicated at 28 in Fig. 3. Each of the end plates 14 and 15 also as provided, as in the previously described modification, with an eccentrically located aperture 16 which preferably is tapped to receive the tapered, pipe-threaded end of one of the metal pipes 29 or 30. As distinguished from the inner tube or conduit 13 of the assembly 11, the inner tube 27 of the tubing assembly 26 is intended to be interconnected into and form a direct part of the low temperature suction or refrigerant vapor line of the system which is represented by the pipes 31. To this end, the ends of these metal pipes 31 are pipe-threaded and the outer end portions

of the inner tube 27 are complementally tapped to receive the same.

A further modification incorporated into the tubing assembly 26 is the provision of a second inner tube 32 extending through suitable eccentrically disposed apertures in the end plates 14 and 15 (Fig. 4) and secured to the latter in similar manner to the mounting of the inner tube 27. This second inner tube 32 is provided for accommodating the passage of electric lines, or the like, through the wall or partition structure 23. Thus, the one tubing assembly will accommodate passage of any and all lines associated with the refrigerating or air conditioning system through a wall or partition structure, while requiring only a single passageway or aperture through such wall and performing the primary purpose of preventing damage to the wall structure, particularly as a result of condensation of moisture on the exterior surface of the low temperature line which normally obtains and results in disfiguration and deterioration of the wall.

As will now better be appreciated from the foregoing description, the principal object of this invention of preventing damage to a wall structure, or the like, through which the lines of a refrigeration system must be extended, is accomplished by mounting a tubing assembly like 11 or 26 in and extending the same through the wall, connecting the outer tube 12 of that assembly into the liquid or discharge line for transmitting the liquid refrigerant from the condenser and receiver to the expansion valve, comprising the relatively high temperature line 19, 20, or 29, 30, of the refrigeration system, and passing the suction or refrigerant vapor line of the system, through which the medium being circulated for the absorption or dissipation of heat is transmitted from the evaporator to the compressor and which comprises the relatively low temperature line, either 25 or 31, through the wall by means of the inner conduit 13 or inner tube 27 so as to be thermally insulated from the wall structure by the outer tube 12 of the tubing assembly and the relatively warmer liquid passing therethrough. Condensation of moisture on the outer surface of the relatively low temperature line 25 or 31 where it passes through the wall or partition structure 23 is thus completely eliminated, so that deterioration and other moisture damage to the wall structure cannot result. This method and the illustrated tubing assemblies for use therewith are of ever increasing utility, because more and more refrigeration and air conditioning systems are being employed in which it is desired to mount the compressor, condenser, and receiver at a point remote from the evaporator and beyond one or more intervening wall or partition structures.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the forms hereinbefore described being merely preferred embodiments thereof.

I claim:

A dry-wall pass through tubing assembly for passing the lines of a refrigerating system through a wall, or the like, comprising an outer cylinder extending through and mounted in said wall, an end plate secured to each end of said cylinder for closing the same, each said plate being provided with a plurality of eccentrically disposed apertures, with similar apertures in the two said end plates aligned with each other longitudinally of said cylinder, means for interconnecting said cylinder into one line of said refrigerating system through one pair of said aligned apertures, and means for accommodating other of said lines for passing the same through said wall, comprising inner tubular means extending through said outer cylinder and the other said aligned apertures in said end plates and secured at the ends thereof to said plates.

References Cited in the file of this patent

UNITED STATES PATENTS

1,318,221	Miles	Oct. 7, 1919
1,806,019	Muffly	May 19, 1931
1,930,296	Warneke	Oct. 10, 1933
2,699,043	Kramer	Jan. 11, 1955
2,797,554	Donovan	July 2, 1957

FOREIGN PATENTS

859,318	Germany	Dec. 11, 1952