

[54] **ACCUMULATOR**

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[22] Filed: **Nov. 25, 1970**

[21] Appl. No.: **92,756**

[52] U.S. Cl. 62/503

[51] Int. Cl. F25b 43/00

[58] Field of Search 62/503

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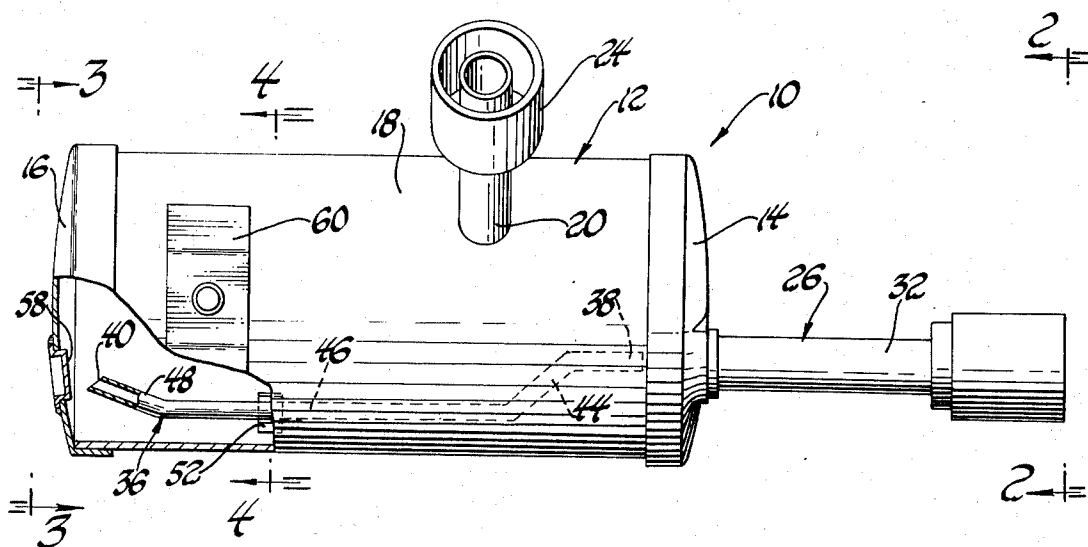
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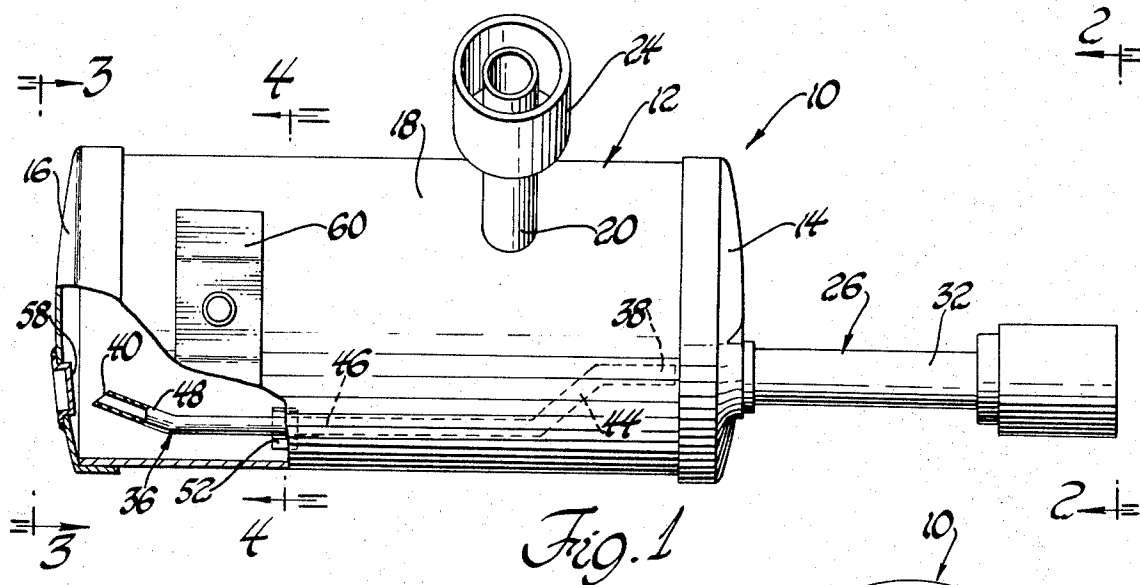
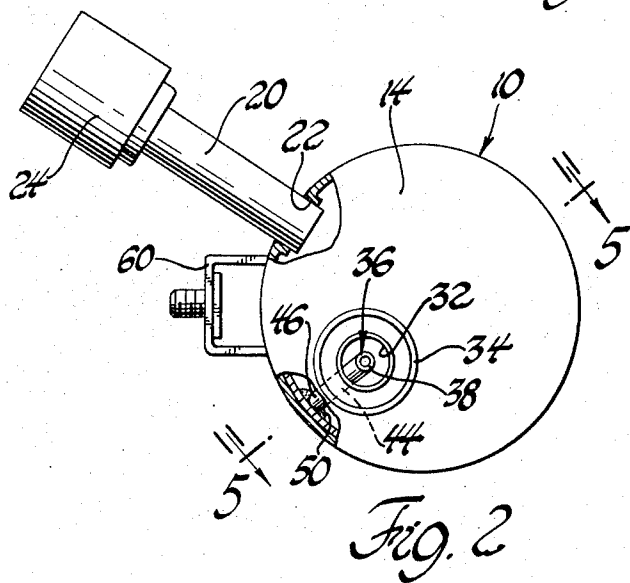
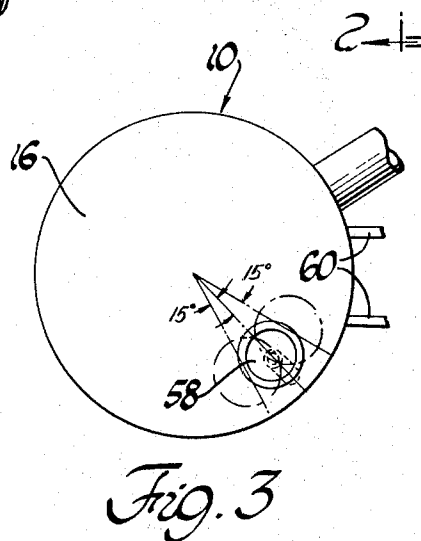
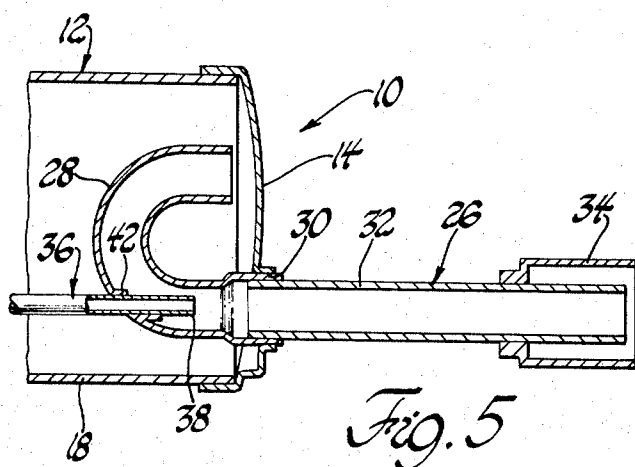
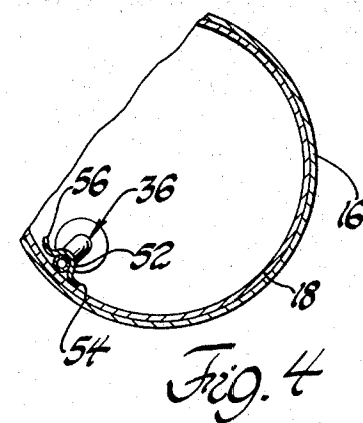
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[57] **ABSTRACT**

An accumulator including a casing having top and bottom ends interconnected by a cylindrical side wall. An inlet conduit extends radially through the cylindrical side wall and an outlet extends from the top end of the casing. An aspirator tube has a first end disposed in the outlet and extends downwardly and slants radially outwardly to a portion which extends along the cylindrical wall and then slants radially inwardly and downwardly to a second end adjacent the bottom end of the casing. The aspirator tube is connected to the side wall of the casing by welding, as brazing and the like, and/or by a clip into which the tube is snapped into position. The bottom end of the casing has a hole with a plug therein disposed adjacent the second end of the aspirator tube.

13 Claims, 5 Drawing Figures





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ACCUMULATOR

The instant invention relates to an accumulator utilized in refrigerator systems. More specifically, the instant invention relates to an accumulator which is used in the line between the compressor and evaporator in a refrigeration system for trapping liquid refrigerant and/or oil to prevent the same from entering the compressor in inordinate amounts which would damage valves, gaskets and the like in the compressor. Accumulators of this type are well known wherein the liquid refrigerant and oil is trapped in the accumulator and deposits at the bottom and is metered back into the flow of refrigerant gases through an outlet by an aspirating tube.

The primary object and feature of this invention is to provide an improved accumulator assembly which is unique in configuration to perform these functions and which is more efficiently and easily manufactured.

Other objects and attendant advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is an elevational view partially broken away of a preferred embodiment of the instant invention;

FIG. 2 is a view taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a view taken substantially along line 3—3 of FIG. 1;

FIG. 4 is a fragmentary cross sectional view taken substantially along line 4—4 of FIG. 1; and

FIG. 5 is a fragmentary cross sectional view taken substantially along line 5—5 of FIG. 2.

Referring now to the drawings wherein like numerals indicate like or corresponding parts throughout the several views, an accumulator constructed in accordance with the instant invention is generally shown at 10.

The accumulator includes a casing which is generally indicated at 12. The casing 12 has a first end defined by a cap 14 and a second end defined by a cap 16. The caps 14 and 16 are interconnected by a cylindrical side wall 18.

Also included is an inlet conduit 20 which extends radially from the longitudinal axis of the casing and is in fluid communication with the interior of the casing. The cylindrical wall 18 has a hole 22 therein which is flanged and the end of the inlet conduit 20 is welded in sealing engagement with the flanged hole 22. The term "welded" as used herein includes brazing, soldering or like securements. A cup-shaped member 24 is disposed on the end of the conduit 20 so that a flexible hose may be disposed about the end of the conduit 20 and within the cup-shaped member 24 and the cup-shaped member 24 crimped to secure the hose to the conduit 20.

The accumulator also includes an outlet conduit 26 which extends from the cap 14 and is in communication with the interior of the casing. As illustrated, the outlet is in two parts and includes a U-shaped member 28 which has one end secured, as by welding, in the hole 30 in the cap 14. The outlet conduit 26 also includes a straight tubular portion 32 which is disposed within and welded to the U-shaped member 28. The other end of the U-shaped member 28 is disposed in spaced relationship to the cap 14. A cup-shaped

member 34 is secured to the end of the tubular member 32 and like the cup-shaped member 24 is utilized for clamping a flexible hose about the end of the tubular member 32.

The accumulator also includes an aspirator tube generally indicated at 36. The aspirator tube 36 has a first end 38 disposed in the U-shaped member 28 of the outlet 26 and a second end 40 disposed adjacent but spaced from the cap 16.

When in the installed position, the cap 14 represents the top of the accumulator and the cap 16 represents the bottom of the accumulator and the side wall 18 extends vertically therebetween.

The outlet 26 extends through the hole 30 in the cap 14 at a position which is spaced radially inwardly from the cylindrical side wall 18. The aspirator tube 36 extends through a flanged hole 42 in the U-shaped member 28 of the outlet 26. The aspirator tube 36 is welded to the flanges of the hole 42. The aspirator tube 36 extends along a straight portion extending through the hole 42 and then extends along an outwardly and downwardly inclined portion 44 to the cylindrical wall 18 and has a major vertically extending straight portion 46 engaging and extending along a major length of the cylindrical wall 18, as shown in FIG. 1. The aspirator tube then extends radially inwardly and is inclined downwardly through the portion 48 to the end 40.

The accumulator also includes connection means 30 connecting the straight portion 46 of the aspirator tube 36 to the cylindrical wall 18. More specifically, the connection means comprises a weld which, as explained above, includes brazing or soldering and which secures the straight portion 46 to the wall, such weld being shown at 50 in FIG. 2. The connection means may also include or may alternatively include a clip 52. The clip 52 is secured to the wall at 54 on one side of the tube 36 and extends in an arcuate path over the tube 36 to a distal end 56 which is defined by a flare. As the tube is installed, the end 38 is inserted into the flanged hole 42 and is rotated so that straight portion 46 engages the flared end 56 of the clip 52 and is rotated and snapped into position under the clip 52 whereby the clip 52 retains the aspirator tube 36 between the clip and the cylindrical wall 18.

The cap 16 has a circular hole therein in which a plug 58 is disposed. The plug 58 is welded in sealing relationship with the cap 16. The hole and the plug 58 are disposed adjacent the end 40 of the aspirator tube 36. More specifically, as disclosed in FIG. 3, the center of the hole in which the plug 58 is disposed is within 15° either side of an imaginary radial line extending from the longitudinal axis of the casing and passing through the straight portion 46 of the tube which engages the cylindrical wall 18.

There is also included bracket means comprising the bracket 60 which extends from the casing 12 for attachment to support structure.

The aspirator tube 36 is secured to the cylindrical wall 18 so as to form a rigid part of the accumulator and to prevent the aspirator tube 36 from rattling by repeatedly engaging the interior walls of the accumulator. The hole in which the plug 58 is disposed may be utilized to visually check that the aspirator tube 36 is secured to and engages the cylindrical wall 18. The hole in which the plug 58 is disposed is also utilized for

removing foreign matter from within the casing after assembly. The caps 14 and 16 are welded, as by brazing, to the cylindrical wall 18 and any resulting foreign particles within the accumulator may be removed through the hole in which the plug 58 is disposed.

The invention has been described in an illustrative manner, and it is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An accumulator comprising: a casing having a first top end and a second bottom end interconnected by at least one vertical side wall, an inlet in communication with the interior of said casing, an outlet extending from said top end of said casing and in communication with the interior thereof, an aspirator tube having a first end disposed in said outlet and a second end adjacent said bottom end of said casing, said aspirator tube having a major vertical portion engaging and extending along a substantial length of said vertical wall of said casing, and connection means connecting said portion to said wall of said casing.

2. An accumulator as set forth in claim 1 wherein said connection means comprises a weld securing said portion to said wall.

3. An accumulator as set forth in claim 2 wherein said weld comprises a brazed connection.

4. An accumulator as set forth in claim 1 wherein said connection means comprises a clip secured to said wall and extending over said portion of said tube.

5. An accumulator as set forth in claim 4 wherein said clip is secured to said wall on one side of said tube and extends over said tube to a distal end having a flare whereby said tube is snapped into a retained position between said clip and said wall.

6. An accumulator as set forth in claim 1 wherein said outlet is spaced radially inwardly from said wall, said tube extends from said outlet radially outwardly to said wall and along said wall and then radially inwardly to said bottom end thereof.

7. An accumulator as set forth in claim 6 wherein said bottom end of said casing has a hole with a plug therein, said hole being disposed adjacent said second end of said tube.

8. An accumulator as set forth in claim 7 wherein the center of said hole is within 15° either side of an imaginary radial line extending from the longitudinal axis of said casing and passing through said portion of said tube which engages said wall.

9. An accumulator as set forth in claim 8 wherein said inlet extends radially from said casing.

10. An accumulator as set forth in claim 9 wherein said outlet is generally U-shaped with one leg extending through said casing and the other leg spaced from said top end of said casing.

11. An accumulator as set forth in claim 10 wherein said connection means comprises a weld securing said portion to said wall.

12. An accumulator as set forth in claim 10 wherein said connection means comprises a clip secured to said wall on one side of the said tube and extending over said tube to a distal end having a flare whereby said tube is snapped into a retained position between said clip and said wall.

13. An accumulator as set forth in claim 10 including bracket means extending from said casing for attachment to support structure.

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