

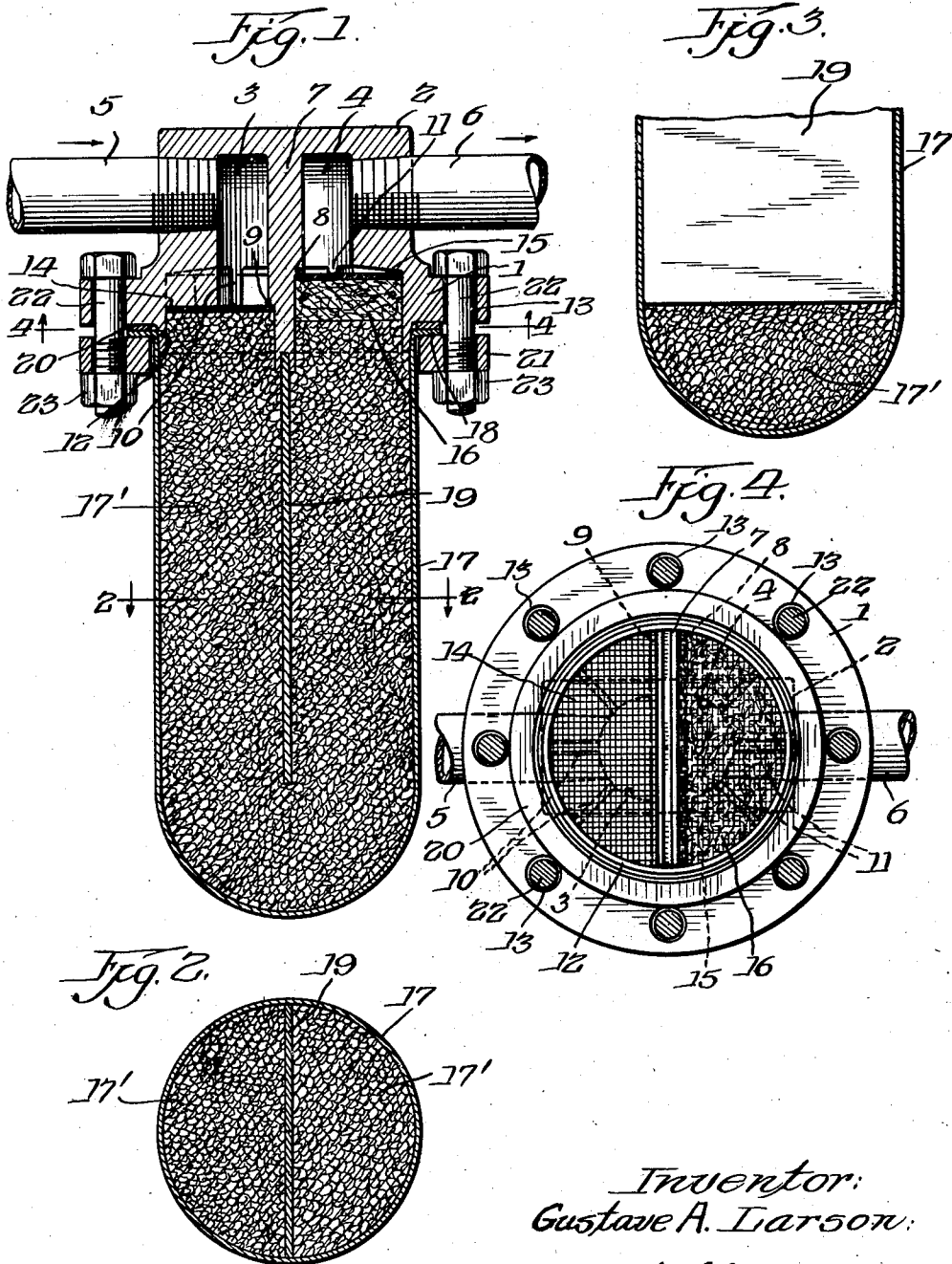
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DEHYDRATOR

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DEHYDRATOR

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2 Claims. (Cl. 210-131)

This invention relates to improvements in dehydrators, more particularly, to those types of dehydrating devices which are used in connection with refrigeration and/or air conditioning apparatus, the invention having for an object to provide a dehydrator of the indicated character which, when installed, will function to remove moisture from the utilized refrigerant liquid and hence, eliminate those operational difficulties attendant its presence in the same.

It is also an object of the invention to provide a dehydrator so constructed as to be apparatus installable or removable in and with a minimum of labor expenditure; moreover, when desired or required, a device which may be conveniently and quickly serviced for dehydrating material refill, etc., without disturbing or otherwise affecting its original connection with the equipped refrigerant liquid circulating conduits.

Additionally, it is an object of the invention to provide a dehydrator wherein a maximum of moisture will be absorbed thereby in a minimum of time.

Yet another object of the invention is to provide a dehydrator in which the coursing of refrigerant liquid therethrough will, by necessity, be through the entire dehydrating material body or area provided thereby, thus, ensuring a maximum removal of moisture and at the same time, avoiding the presence of inactive portions or areas in such dehydrating material.

The foregoing, as well as other objects, advantages and meritorious teachings of the invention, will be in part obvious and in part pointed out in the following detailed disclosure thereof, when taken in conjunction with the accompanying drawing, it being understood that the particular form of the invention presented herein is now considered to be the best mode of embodying its principles, but that modifications and changes may be made in specific embodiments without departing from its essential features.

In the drawing:

Figure 1 is a vertical section through the improved dehydrator, showing it installed in the refrigerant liquid circulating conduits of a refrigerating or air conditioning apparatus.

Figure 2 is a horizontal section taken on the line 2-2 of Figure 1, looking in the direction in which the arrows point.

Figure 3 is a fragmentary vertical section of the lower portion of the dehydrator, taken at substantially right angles to Figure 1, showing the manner and the extent of engagement of the baffle plate in the dehydrant container, and

Figure 4 is a horizontal section taken, approximately, on line 4-4 of Figure 1, looking in the direction in which the arrows point.

Having more particular reference to the drawing, in connection with which like characters of reference will designate corresponding parts throughout, my improved device consists of a circular head 1 formed with a substantially flat normally inner side, while the outer portion thereof is provided with an integral rectangularly shaped body or thickened portion 2. The head 1 and the rectangularly shaped body 2 may be and preferably are cast from suitable metal. The head 1 is chambered and, as will be noted upon reference to Figure 1, this chambered portion opens onto the normally inner side of the head, while the inner side of the chamber is slightly concaved and communicates with ways or chambers 3 and 4, formed in the rectangularly shaped body or thickened portion 2. The outer or upper end portions of the chambers or ways 3 and 4 communicate with laterally disposed inlet and outlet ports, which, in turn, are internally screw threaded and adapted to have the inlet and outlet portions of conduits 5 and 6, respectively, engaged therein, as is also shown in Figure 1 of the accompanying drawing. As will be understood, the conduits 5 and 6 serve to convey refrigerant liquid to and from the dehydrator when the latter is installed in a refrigerating or air conditioning apparatus.

The chambers or ways 3 and 4 provided the thickened portion or rectangularly shaped body 2 are separated by means of a wall 7 transversely disposed therethrough and extending into and somewhat beyond the chambered head 1. That portion of the wall 7 received in the chamber of the head 1 is widened, as will be observed upon reference to Figure 4 of the accompanying drawing, and is disposed diametrically thereof. Relatively vertically spaced shoulders, indicated at 8 and 9, are formed upon the opposite sides of the wall 7, particularly, that portion thereof within the head chamber, for a purpose which will be hereinafter described, while the normally inner or free end of said wall is slotted throughout its length for a purpose which, too, will be hereinafter more fully described.

Integral radially disposed ribs 10 and 11, are provided the chambered portion of the head 1 and, as will be noted, the depths of the ribs 10 are such that they extend into substantially horizontal alignment with the shoulder 9 of the wall 7, while the ribs 11 are of considerably lesser

depths and extend to points horizontally aligning with the shoulder 8 of said wall 7.

An externally tapered annular flange 12 is integral with or otherwise provided to the normally inner side of the circular head 1 adjacent and about its circularly chambered portion. The outer or free marginal portion of said flange substantially horizontally aligns with the slotted free or extended end of the wall 7, as will be observed upon reference to Figure 1 of the accompanying drawing.

To facilitate the engagement of connecting means or devices with the circular head 1, I may and preferably do form a plurality of relatively equi-spaced and circularly arranged openings, generally indicated by the numeral 13, therein.

Semi-circular screen pieces 14 and 15 are snugly received within the head chamber upon opposite sides of that portion of the wall 7 engaged or received therethrough. The screen 14, as will be noted, is seated upon the outer extremities of the radially disposed ribs 10 and the shouldered portion 9 of said wall 7, while the screen 15 is seated upon the outer ends of the shallower ribs 11 and the horizontally aligned shouldered portion 8 of the wall 7. A filtering body 16, made of felt or other suitable material, of size and shape to be snugly received within that portion of the head chamber communicating with the way 4, is engaged with the adjacent side of the screen 15. Such filtering body, obviously, will serve to prevent loss or passage of the dehydrant material by the screen 15 into and through the outlet way 4 and its connected conduits 6.

A cross-sectionally circular and somewhat elongated cup-like container 17 is provided the head 1 and, as will be noted upon reference to Figure 1 of the accompanying drawing, has its open and normally upper end formed with a right angularly disposed annular flange or lip 18. The inside diameter of the container 17 is such that it will snugly engage over the tapered outer side of the annular flange 12 provided the normally inner side of the head 1. Also, it will be noted that the lower or free end portion of the wall 7, with engagement of the container 17 over the annular flange 12, will have been engaged or extended for a distance downwardly into said container.

A rectangularly shaped baffle plate or wall 19 is detachably engaged, at one end, in the slotted free and lower end of the wall 7, as is shown in Figure 1 of the accompanying drawing. The width of this baffle plate or wall 19 is such that it will be snugly received within the medial portion of the container 17, while its length is such that the lower ends or corners thereof will be brought to bear upon or will be arranged immediately adjacent the radii of its curved bottom, as shown in Figure 3 of the drawing. Thus, it will be seen that the container 17 will be longitudinally and substantially medially divided by the baffle plate or wall 19, except for its curved lower end portion.

In order that the container 17 may be securely connected to the circular head 1, its open upper end is snugly or even bindingly engaged over the tapered outer sides of the annular flange 12 with its right angularly disposed flange or lip bearing upon a suitable packing gasket 20 interposed between the same and an adjacent portion of the normally inner side of the circular head 1. At this time, a clamping annulus or ring 21 is engaged over and about the now upper portion of

the container 17 in bearing contact with the adjacent side of the aforesaid flange or lip 18. Connecting bolts, generally designated by the numeral 22, are passed through the equi-spaced circularly disposed openings 13 of the circular head 1 downwardly through correspondingly arranged openings provided in said clamping annulus or ring 21, whereupon nuts or other suitable locking devices 23 are turned into engagement with their screw threaded extremities, hence, effecting a positive clamping connection between the circular head 1 of the improved dehydrator and its container 17.

It, of course, will be understood that in usage of my improved dehydrator, the cup-like container 17 will be filled with suitable dehydrant material, indicated at 17', as for example, silica gel, activated alumina, anhydrous calcium chloride, etc., displacement or loss of which from the container through either the apparatus conduits 5 or 6 will be prevented by the hereinbefore described screens 14 and 15 and the filtering body 16.

In operation of my improved dehydrator and assuming that the same has been installed in a refrigeration or air conditioning refrigerant liquid circulating system, i. e., the inlet and outlet conduits 5 and 6, as shown in Figure 1 of the accompanying drawing, said refrigerant liquid, such as methyl chloride, sulphur dioxide, etc., will enter the inlet side of the rectangularly shaped body or thickened portion 2 via the inlet conduit 5, whereupon it will pass through the way 3 into the communicating portion of the head provided chamber, thence through the screen 14 into the dehydrant provided or filled container 17. The circulating force or pressure of the refrigerant liquid will now cause it to be passed downwardly through the dehydrant in the container 17 through the channel provided by the baffle plate or wall 19, and the corresponding or left side of said container 17, thence along the curved bottom of said container under the lower end of the baffle plate 19, and thereupon, upwardly through the dehydrant material on the outlet side of the container, i. e., the opposite side of the baffle plate 19 and the remaining side of the container 17. The refrigerant liquid will continue its upward travel, as indicated, passing through the filtering body 16, where it will be relieved or freed from the dehydrant material, thence through the screen 15 through the outlet way 4 into the outlet conduit 6.

When required, the dehydrant material provided the container 17 may be replenished or replaced, merely by disconnecting the hereinbefore described bolts 22, whereby to release and permit dropping of the clamping annulus or ring 21, and thereupon, downward disengagement of the open and upper end of the container 17 from the tapered annular flange 12 of the dehydrator head 1. With refill, the container 17, of course, is re-engaged and reconnected to the dehydrator head 1, in the manner hereinbefore described.

It is, of course, to be understood that the container 17 may be constructed in different sizes or lengths, to satisfactorily or efficiently accommodate refrigerating or air conditioning systems of greater or lesser size; moreover, that the dehydrator head may be made in different sizes for like purposes.

I also desire to invite particular attention to the fact that following an original installation of the dehydrator head, said head need not be thereafter disturbed, removed or otherwise ad-

justed, inasmuch as dehydrant refill of the device is effected, solely and entirely, by disengagement and subsequent re-engagement of the container 17 with the fixedly installed dehydrator head.

By comparatively slight modification of the construction of the plate or wall 19, my improved device may be advantageously converted into a strainer. Such conversion, if desired, can be readily effected by replacing the solid or imperforate element 19 with one of foraminated or perforate formation, i. e., a screen or its equivalent, which, instead of extending medially into the container 17 to a point near, but spaced from its bottom, will preferably extend throughout its entire length or depth into engagement with said bottom. Thus, liquid flowing into the container 17 via its inlet port, will pass through the foraminated body and suitable filtering or straining material in the container, to and through its outlet port. Thereby, the liquid will be freed or strained of all undesired foreign matter.

I claim:

1. A dehydrator, comprising a head having a multi-ported chamber therein opening onto its normally inner side, a portion of the chamber being enlarged, a wall in the head dividing said chamber, ribs on the head in one side of the enlarged portion of the chamber, screening means in said side bearing upon the adjacent portions of said ribs and upon an adjacent side portion

of said wall, filtering means in the remaining side of said enlarged portion of the chamber, said wall having a way formed in and disposed longitudinally of its inner and free marginal portion, a container connected to and communicating with the normally inner side of the head, and a baffle plate removably engaged at one end in the way in said wall and extending into said container.

2. A dehydrator, comprising a head having an internal chamber opening onto its normally inner side and ways in the normally outer side communicating with the chamber, the normally inner portion of said chamber being enlarged, a fixed wall in the head intermediately of the chamber having its free side extended for a distance beyond the normally inner side of the head and formed with a longitudinally disposed way, spaced ribs on the inner extremity of the enlarged chamber portion on one side of the fixed walls, screening means in said side bearing upon the adjacent portions of said ribs and upon an adjacent side portion of said wall, filtering means in the remaining side of said enlarged portion of the chamber, a container detachably connected to and communicating with the normally inner side of the head, and a baffle plate removably engaged at one end in the way in said wall and extending into said container.

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