

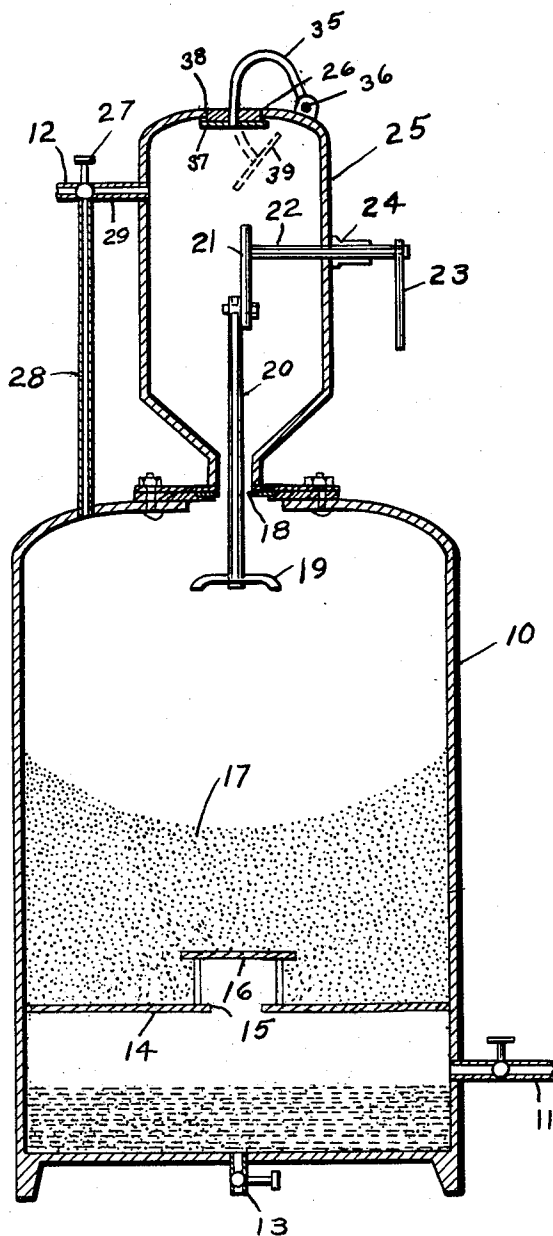
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AIR DRIER AND CHARGING MEANS COMBINATION

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1 Claim. (Cl. 55—388)

This invention relates to air driers and, more particularly, to the type of air drier known as a deliquescent air drier.

Previous air driers of the general type disclosed herein required that chemical material be added from time to time to replace that used and they had to be shut down in order to replace the chemical materials therein. In the present invention, a deliquescent type of air drier is disclosed in combination with an improved structure for inserting the chemical material without shutting down the air drier.

It is, accordingly, an object of the present invention to provide an improved air drier.

Another object of the invention is to provide an air drier in combination with a device for inserting chemical material therein.

A further object of the invention is to provide an air drier which is simple in construction, economical to manufacture, and simple and efficient to use.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing and more particularly pointed out in the appended claim, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

The figure of drawing is a longitudinal cross sectional view of an air drier with the material inserting means as disclosed.

Now with more specific reference to the drawing, an air drier is shown having an air drier tank 10 and an inlet 11 with a sump drain 13. A partition 14 is provided which divides the tank 10 into an inlet section and an outlet section. The partition 14 has an opening 15 therethrough with a baffle 16 supported over it to support chemical material 17.

An opening 18 is closed by a connecting valve 19 which is attached to a rod 20. The rod 20 is attached to the link attached in turn to a crank 21 which is fixed to a shaft 22. The shaft 22 has a handle 23 on the outside end thereof and passes through a gland 24 to prevent leakage. A storage tank 25 has a top closure 26 which may be opened to refurnish material therein.

The closure 26 is supported by means of an arm 35 which is swingably attached to the storage tank 25 at 36 and has a sealing plate 37 which sealingly engages the inside surface near the periphery of a charging opening 38 in the storage tank. Therefore, when there is air pressure in the storage tank 25, the air forces the flange of the sealing plate 37 into sealing engagement with the peripheral edges of the opening 38. When the pressure in the storage tank 25 is relieved, the arm 35 can swing downwardly to bring the sealing plate 37 to the dotted line position 39.

A three way valve 27 will either direct air from a line 28 to a line 29 or from the line 28 to a line 12.

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During operation, when the valve 19 is pulled upward by the crank 21 to close the opening 18 and the valve 27 is moved to a position to connect the air from the line 28 to the line 12 and compressed air is inserted through the inlet 11, the valve 19 will be urged to closed position by the air from the inlet 11 compressed in the tank 10. The air will flow from the inlet 11 through the tank 10 by way of the opening 15 in the partition 14 to the outlet line 12, passing through the chemical material 17 on its way. Some of the chemical material 17 will be dissolved by moisture in the air and the solution will collect in the bottom of the tank.

When the chemical is depleted and it is desired to replace the chemical material, the operator first opens the closure 26 and fills the storage tank 25. Then he tightly closes the closure 26. He then opens the three-way valve 27 which disconnects the pipe 28 from the pipe 12 and connects the pipe 28 to the line 29. The air pressure in the tank 25 is retained by the closure 26 and builds up above the valve 19 so that the pressure in the tank 25 and the tank 10 is equal. The valve 19 can then be opened by means of the handle 23 by moving the handle 23 to the position shown and the granular material in the storage tank 25 will then fall down into the tank. Then the handle 23 may be moved up to pull the valve 19 to the closed position and the valve 27 is moved to connect the line 28 to the line 12 and to shut it off from the line 29. As pressure in the tank is reduced, the force of air below the valve 19 will urge the valve 19 to a tightly closed position. The closure 26 can then be reopened and the tank 25 is ready for another charge of chemical.

The chemical material 17 may be of a deliquescent type such as sodium chloride mixed with a minor quantity of calcium chloride and it can have a suitable rust inhibitor therewith such as sodium dichromate which will also further activate the sodium chloride to make it more deliquescent.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claim.

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

In combination, an air drier and a charging device, said air drier comprising a tank having an inlet and an air drier outlet and a partition therebetween, chemical desiccant material supported on said partition and adapted to absorb moisture and to go into solution with said moisture and collect as an aqueous solution in the bottom of said tank, said charging device comprising a storage tank, an opening in said drier tank connecting said air drier tank and said storage tank, a connecting valve having means for opening and closing said opening in said drier tank, a charging opening in said storage tank, a sealing plate, means on the outside of said storage tank movably connecting said sealing plate to said storage tank,

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said sealing plate being movable from a position in closing relation with said charging opening in said storage tank to a position inside said storage tank, and a three-way valve having means to selectively connect said air drier outlet to an outlet line and to said storage tank, 5
said sealing plate being adapted to be urged into sealing relation with said charging opening when air is connected from said air drier tank to said storage tank by said three-way valve, 10
manual means for opening said connecting valve when said air is connected from said air drier outlet to said storage tank and for maintaining said connecting valve in sealing relation with said drier tank around

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said opening therein connecting said storage tank and said drier tank when said three-way valve connects said air drier outlet to said outlet line.

References Cited in the file of this patent

UNITED STATES PATENTS

6,252	Williams	Nov. 17, 1830
345,355	Adams	July 13, 1886
498,397	Leach	May 30, 1893
1,376,691	Hartman	May 3, 1921
2,325,061	Kaufman	July 27, 1943
2,833,935	Roujob	Feb. 11, 1958
2,854,156	Payne	Sept. 30, 1958