

Feb. 20, 1940.

A. R. VELASCO ET AL

2,191,052

SAVE-ALL

Filed Oct. 21, 1938

2 Sheets-Sheet 1

Fig. 1.

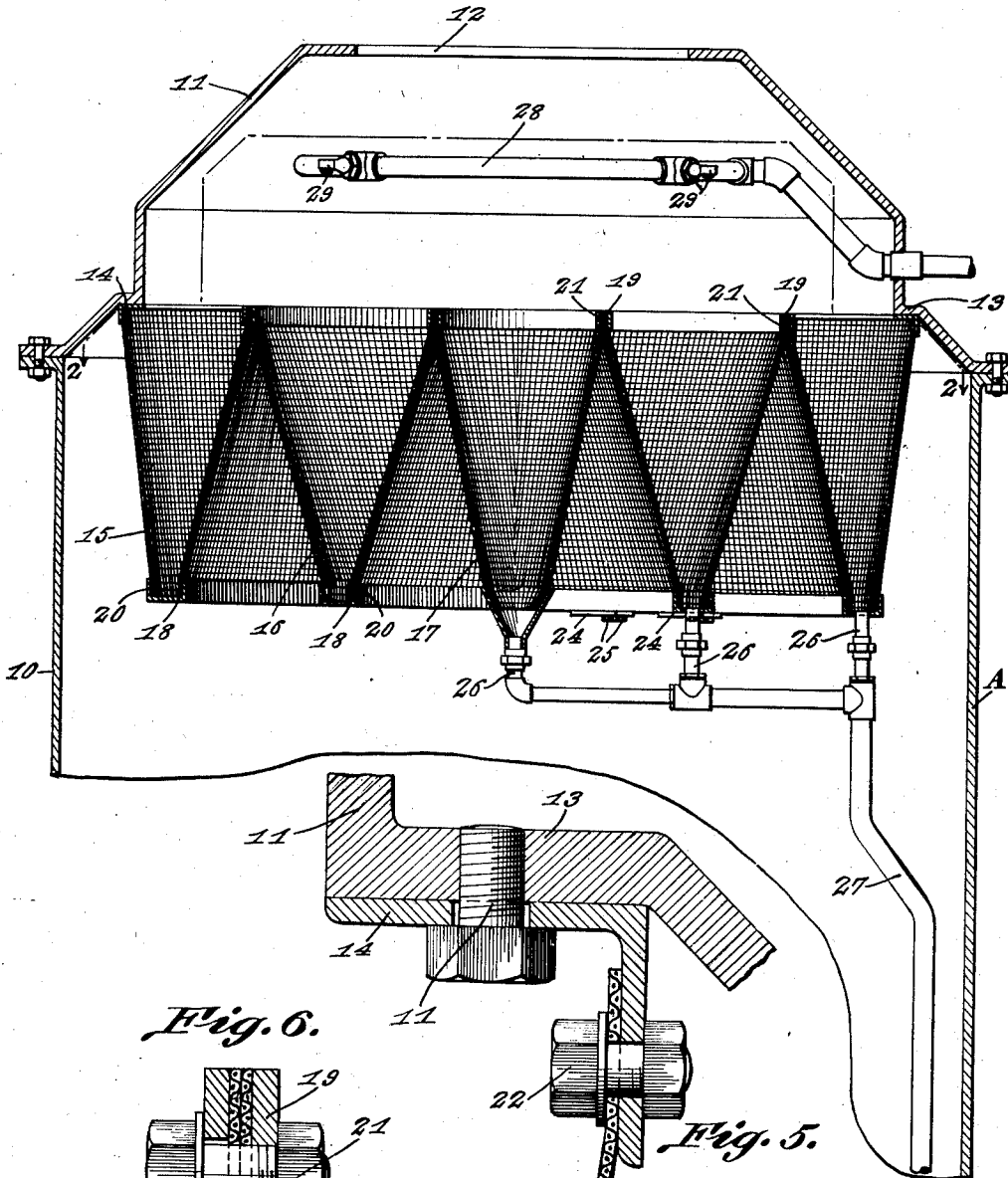


Fig. 6.

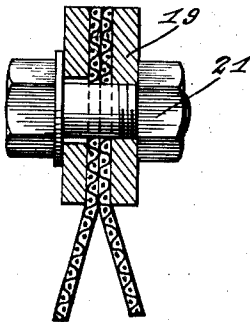
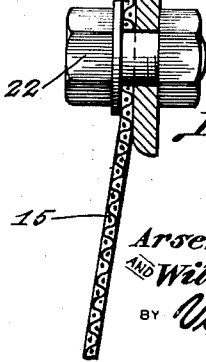


Fig. 5.



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2 Sheets-Sheet 2

Fig. 2.

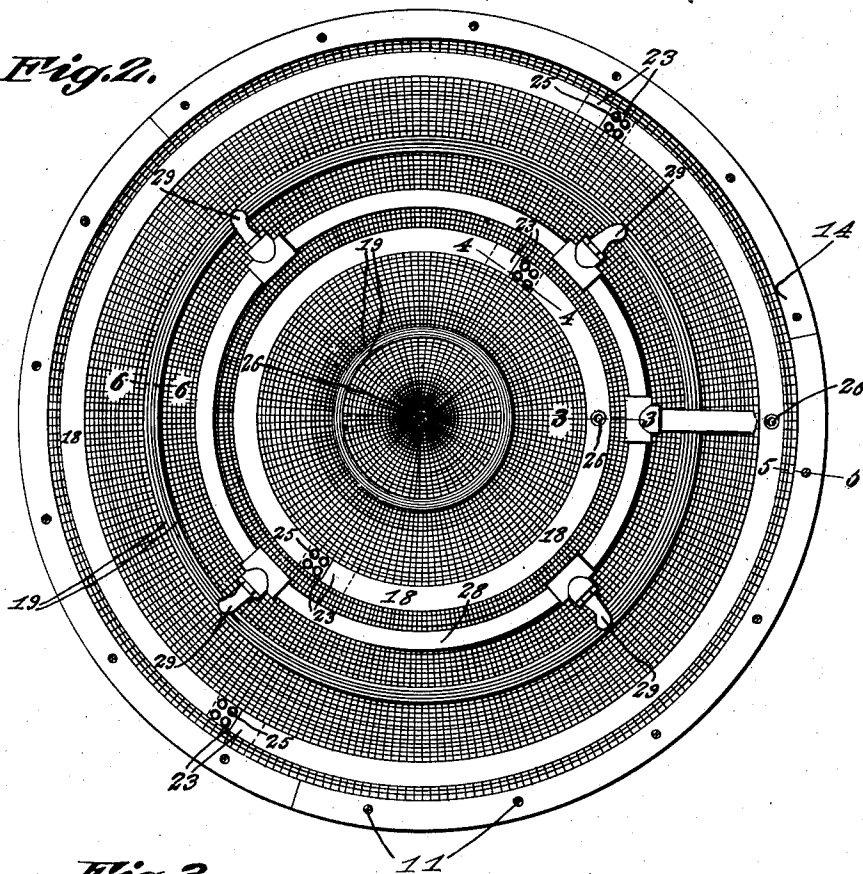


Fig. 3.

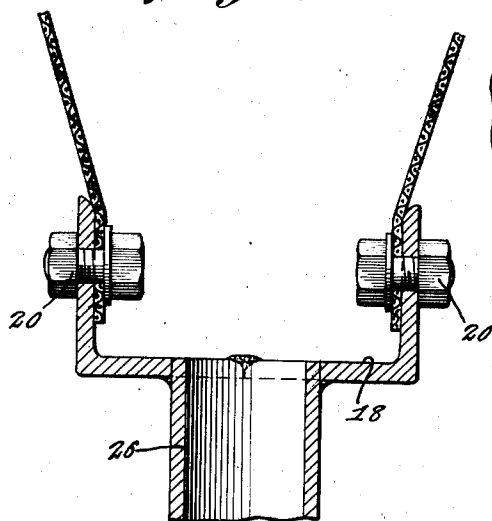
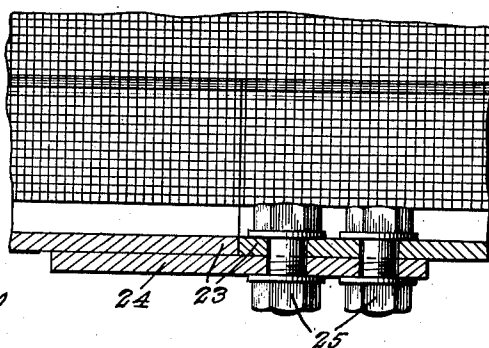


Fig. 4.



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UNITED STATES PATENT OFFICE

2,191,052

SAVE-ALL

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Application October 21, 1938, Serial No. 236,344

1 Claim. (Cl. 159—31)

The invention relates to a save-all and more particularly to a separator for evaporators.

The primary object of the invention is the provision of a device of this character wherein the same is adapted for service in evaporator vessels of the industrial kind and the liquid entrained by vapor therein will be held back more effectively particularly where high velocity gases are encountered and such liquid separates from the vapor without restriction of the vapor currents, no clogging taking place and rapid evaporation assured, the device being particularly effective where light liquids like cane juices are handled.

Another object of the invention is the provision of a device of this character wherein a uniform vapor charge is assured and the carrying off or loss of entrained liquor by strong vapor currents will be avoided, the entrainment disappearing without retardation of vapor flow in the working of the device.

A further object of the invention is the provision of a device of this character, which is simple in its construction, thoroughly reliable and efficient in operation, strong, durable, susceptible of being easily cleaned and drained, avoiding the carrying off of entrained liquor with the vapor thereby assuring a saving of sugar particles through the curtailment of the entrainment, and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention and pointed out in the claim hereunto appended.

In the accompanying drawings:

Figure 1 is a fragmentary vertical sectional view through a casing forming a cell showing the device constructed in accordance with the invention applied.

Figure 2 is a sectional view on the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a fragmentary sectional view on enlarged scale taken on the line 3—3 of Figure 2.

Figure 4 is a fragmentary sectional view on the line 4—4 of Figure 2.

Figure 5 is a sectional view on the line 5—5 of Figure 2.

Figure 6 is a sectional view on the line 6—6 of Figure 2.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates generally a portion of a casing forming a cell 10 and this casing is of suitable construction in which sugar or other solutions may be boiled for the purpose of effecting the evaporation and concentration of the same. The casing A is open at its top and is covered by a superimposed dome 11 having the central way or opening 12 for vapor and this opening is communicative with an elbow or other lead of a vapor pipe for directing vapor to the condenser (not shown). The dome is formed with a seat 13 to which is secured an annular ring 14 which is of inverted substantially L-shape in cross section from which is suspended concentrically arranged inverted truncated substantially cone-shaped screens or frustum screening 15, 16 and 17, respectively, of wire mesh fabric. The screens have their walls disposed at an angle to the perpendicular and the lower edges of these walls are fastened to channeled members forming troughs 18 for condensed liquor to be collected therein. The upper edges of the fabric of the screens 16 and 17 are clamped between interfitting hoops 19, bolted or otherwise fastened at 20 and 21, respectively, while the fabric of the screen 15 is bolted or otherwise fastened at 22 to the ring 14. The annuli constituting the troughs 18 are each formed in two sections with the ends 23 thereof abutting each other, and cover pieces 24 underlie these abutting ends and are bolted at 25 to an abutting end. Leading from the troughs 18 common to the respective screens 15, 16 and 17 are take-off branches 26 communicative with a pipe 27 for conveying the liquor collected in the troughs for drain thereof.

Superposed above the screens 15, 16 and 17 and within the dome 11 is a spraying pipe 28 having the convolute spray nozzles 29 and the purpose of this pipe with the said nozzles is for the spraying of caustic soda solution onto the fabric of the screens 15, 16 and 17 for the cleaning thereof when required and such spraying is effected should the save-all likely become clogged while in operation. This boiling caustic soda solution when sprayed enables the scale to be scrubbed off by steel brushes for a thorough cleaning of the screens or the device in its entirety.

By the arrangement of the screens and the disposition thereof, the same will not in the least restrict the volume of the vapor evolved from boiling liquid and the entrained liquid will be separated from the vapor to avoid the passing off of any portion of the liquor with the said vapor, the liquor separates from the vapor when the same hits the screens and through capillary

attraction will flow through the screen openings for collection within the troughs 18. Maximum drainage is assured due to the inclined disposition of the fabric of the screens in that the said fabric is inclined so that drainage will take place in two ways, namely, falling back vertically to the level and obliquely along the plane.

The cover plates 24, while bolted to one end of each trough, are welded or otherwise made permanently secure to the other end of such trough. Entrained liquor will be more successfully held back so that the same can not pass off with the vapor and will be positively separated from the latter, the screening and the disposition thereof being most effective for this purpose.

What is claimed is:

A device of the character described comprising a casing adapted for evaporation and concentration purposes and having a dome, an annular ring seated in said dome and having the side

of the casing concentric to and removed therefrom, concentrically arranged alternately inverted truncated substantially cone-shaped screens within the casing and suspended by said ring, the walls of the said screens being angularly disposed to the perpendicular and reticulated, interfitted hoops joining the upper screen walls adjacent to each other of the said screens, channeled ring-like members joined with the lowermost portions of said reticulated walls and forming troughs common to the respective screens, take-off branches leading from the said ring-like members, a drain pipe having communication with said branches, a circular spray nozzle superposed with relation to said screens, and a supply pipe connected with said nozzle for delivering caustic solution to the said nozzle for the spraying thereby of said solution onto the screens.

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