Oct. 26, 1926. 1,604,418

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SEPARATOR

Original Filed March 19, 1919

Fig. 1.

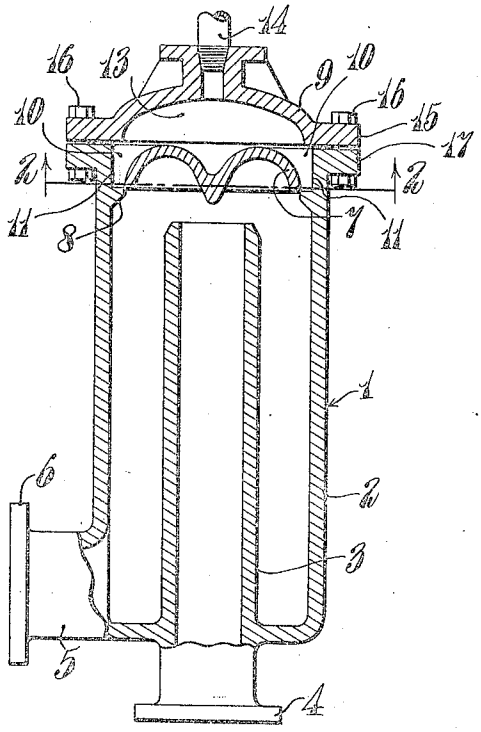
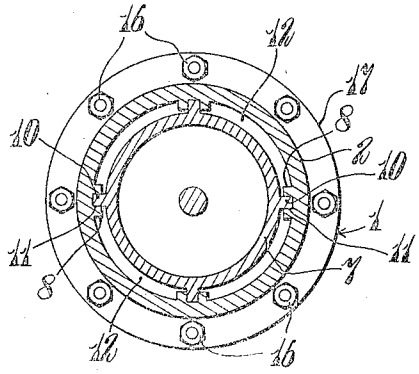


Fig. 2.



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by
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UNITED STATES PATENT OFFICE.

JOHN OLIPHANT, OF CHICAGO, ILLINOIS, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, A CORPORATION OF MASSACHUSETTS.

SEPARATOR.

Original application filed March 19, 1919, Serial No. 283,592. Divided and this application filed June 9, 1922. Serial No. 567,145.

My invention relates to air lift systems, and more particularly to boosters for employment in connection therewith.

An object of my invention is to provide an improved booster for employment in connection with air lift systems, and more particularly for employment in connection with air lift systems adapted especially for the handling of acids, which in very simple form will provide efficient separation of the air and fumes from the acid or other liquid and enable the latter to be delivered under pressure as and when desired. Other objects and advantages of my invention will hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a central vertical section through the separator constituting the illustrative embodiment of my invention.

Fig. 2 is a horizontal transverse section on the line 2—2 of Fig. 1.

The illustrative embodiment of my improved separating mechanism is generally designated 1. This mechanism, as shown, includes the separator casing 2 herein having a central up pipe 3 formed integral therewith and extending upward therein to a point near its top and also extending below the same and terminating in a flanged joint 4 for connection to the riser pipe of an acid or other liquid pumping system. The casing 2 also has a lateral liquid outlet 5 formed integral therewith and located adjacent its bottom, this outlet 5 being provided with a flange 6 for connection to a discharge pipe leading to the point of storage or use of the liquid pumped. It will also be noted that an umbrella 7 is disposed above the outlet of the pipe 3 and clamped between radial lugs 8 on the inner periphery of the casing 2 and a removable cover 9. As shown, this umbrella 7 is also provided with radial lugs 10 received in recesses 11 in the lugs 8 and the two sets of lugs 8 and 10 cooperate to form a plurality of annularly disposed openings 12 leading upward into a pressure chamber 13 in the cover 9 which in turn communicates with a restricted vertically disposed fume outlet 14 in the latter, which outlet may conduct the fumes or air to any suitable point of discharge and may be controlled in any desired manner to maintain the liquid pressure within the booster casing to effect the discharge under pressure of the liquid therefrom. As shown, the cover 9 is also flanged at 15 and removably attached as by screws or bolts 16 to a corresponding flange 17 on the upper edge of the casing 2, the flange 15 extending inwardly in such a manner as to overlie the lugs 10 and thereby clamp the umbrella 7 securely in position.

In the operation of my improved separator mechanism it will be noted that a mixture of air and liquid is discharged under pressure through the pipe 3 and this mixture rushes out against the umbrella 7. Due to the location of this umbrella, it will be observed also that the liquid will be deflected and carried downward along the inner walls of the casing 2 to the bottom of the casing and, through the accumulated pressure of the released air and fumes at the top of the casing, will be caused to flow out through the pipe 5 to the desired place of discharge. It will further be observed that the air and fumes in the acid are effectually separated and enabled to pass out through the apertures 12 into the pressure chamber 13 formed in the cover 9 above the umbrella, the excess passing therefrom to the atmosphere or a suitable receptacle through a restricted outlet 14 and any desired piping.

As a result of my improved construction it has been found possible to make the three simple parts of my improved separator in the form of non-corrodible castings and thereby increase the life of the apparatus and reduce the cost of manufacture of the same. Attention is also directed to the fact that the entire apparatus is exceedingly simple and that by the mere removal of a few bolts connecting the flanges 15 and 17, the entire separator may be dismounted for cleaning or inspection. These and other advantages of my improved construction

will, however, be clearly apparent to those skilled in the art.

This case is a division of my copending application, Serial No. 283,592, filed March 19, 1919.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In an air lift pump, a separator casing having a coaxially disposed mixture delivering inlet extending substantially to the top thereof, and a liquid delivering outlet, supporting means including recessed lugs, and separating means disposed over said inlet and insertible in said supporting means.

2. In an air lift pump, a separator casing having a mixture inlet and a liquid outlet, supporting means including recessed lugs, separating means disposed over said inlet and having portions insertible in the recesses in said supporting means, and means for rigidly securing said separating means within said supporting means.

3. In an air lift pump, a separator casing having a coaxially disposed mixture inlet and a liquid outlet, an umbrella top disposed over said inlet for directing the flow of mixture rearwardly to effect separation thereof, supporting means for said umbrella top cooperating to form pressure outlets, and an apertured cover removably clamping said umbrella top in position.

4. In an air lift pump, a separator casing having a mixture inlet extending substantially to the top thereof and a liquid outlet, an umbrella top disposed over said inlet for directing the flow of mixture rearwardly to effect separation thereof, abutment means for supporting said umbrella top cooperating to form an annular pressure fluid outlet surrounding the same, and a cover disposed over said umbrella top.

5. In an air lift pump, a separator casing having a mixture inlet extending substantially to the top thereof and a liquid outlet, an umbrella top disposed over said inlet for directing the flow of mixture rearwardly to effect separation thereof, supporting means for said umbrella top cooperating to form an annular pressure fluid outlet surrounding the same, and a removable cover for said casing disposed over said umbrella top constituting holding means for the latter and releasable for removal independently thereof.

6. In an air lift pump, a separator casing having an inlet and radial abutment members with a vertical slot formed therein, and separating means having radial lugs adapted to seat in said slots to assist in obtaining an operative relation therebetween.

7. In an air lift pump, a separator casing having a mixture inlet and a liquid discharge, said casing also having radial abutment members each having a vertical slot formed therein, separating means disposed over said inlet and having radial lugs insertible in said slots, and a cover member for said casing engaging said separating means to maintain said lugs seated in said slots.

8. In an air lift pump, a separator casing having a mixture inlet and a liquid discharge, an umbrella top slidably connected to said casing and having means disposed over said inlet for directing the mixture rearwardly to effect separation thereof, and a cover secured to said casing for rigidly clamping said umbrella top to the latter.

9. In an air lift pump, a separator casing having a mixture inlet and a liquid discharge, said casing also having supporting means, a separating member insertible within said supporting means over said mixture inlet and having sliding abutting engagement with said supporting means, and a cover member for said casing engaging said separating member for clamping the latter to said casing.

10. In an air lift pump, a separator casing having a mixture inlet and a liquid discharge, said casing also having vertically slotted abutments formed thereon, a separating member disposed over said inlet and having lateral projections insertible in said slots, and a cover member for said casing engaging said separating member for clamping the latter in position.

11. In an air lift pump, a separator casing having a mixture inlet and a liquid discharge, said casing also having vertically slotted abutments formed thereon, a separating member disposed over said inlet and having lateral propections insertible in said slots, said projections cooperating to form an annular pressure fluid outlet surrounding the same, and a cover member for said casing engaging said separating member for clamping the latter in position.

12. In an air lift pump, a separator casing having a mixture inlet and a liquid discharge, said casing also having inwardly projecting vertically slotted supporting portions, an umbrella top disposed within said casing over said inlet for directing the mixture rearwardly to effect separation thereof, said umbrella top having vertically disposed projections insertible in said slots and abutting against said supporting portions, and a cover member for said casing engaging said umbrella top for clamping the latter to said casing.

13. In an air lift pump, a separator cas-

ing having a mixture inlet and a liquid discharge, an umbrella top disposed over said inlet for directing the mixture rearwardly to effect separation thereof, and a cover for said casing engaging said umbrella top for clamping the latter in position between said casing and cover.

14. In an air lift pump, a separator casing having therein a separating means and a coaxially disposed mixture inlet, said casing and separating means having vertically interlocking projections cooperating to support the separating means in said casing.

In testimony whereof I affix my signature.

JOHN OLIPHANT.