J. OLIPHANT.

AIR LIFT BOOSTER.

APPLICATION FILED JUNE 28, 1917.

1,275,592. Patented Aug. 13, 1918.

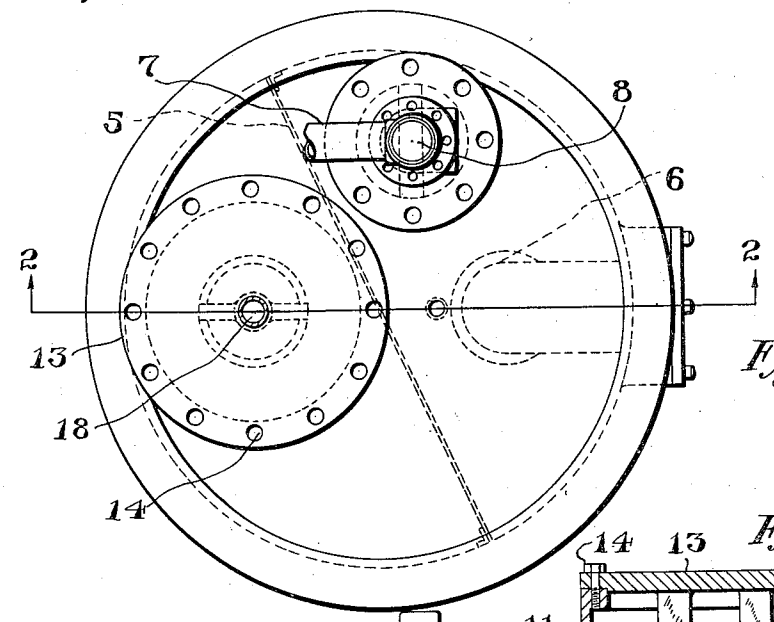


Fig. 2.

Fig. 3.

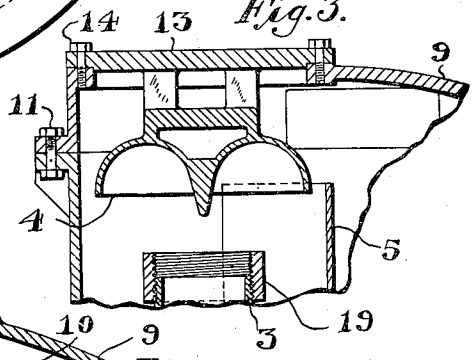
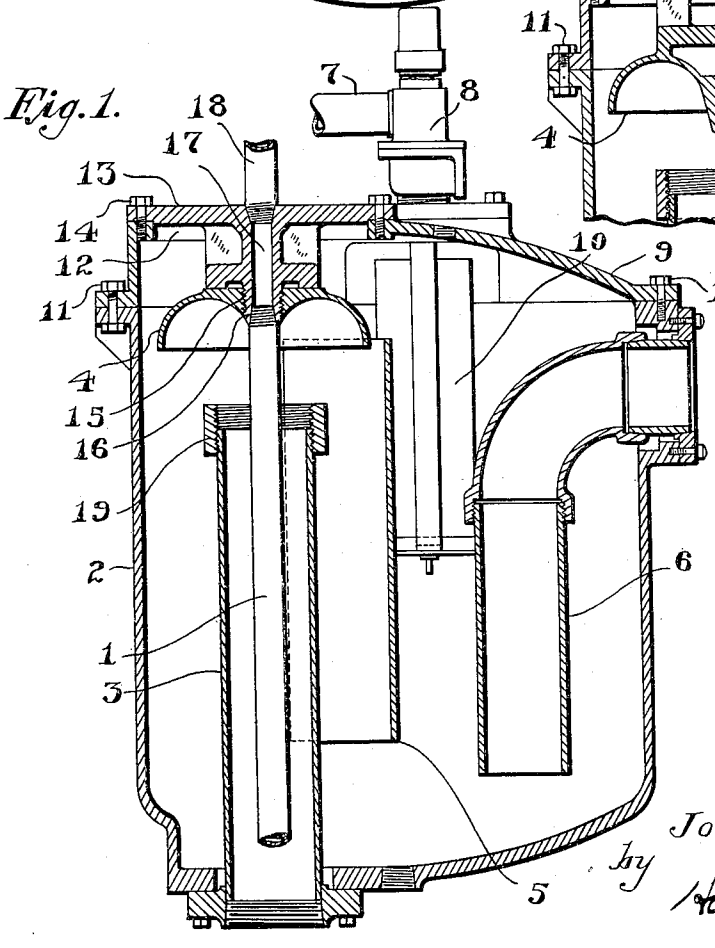


Fig. 1.



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UNITED STATES PATENT OFFICE.

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

AIR-LIFT BOOSTER.

1,275,592. Specification of Letters Patent. Patented Aug. 13, 1918.

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To all whom it may concern:

Be it known that I, JOHN OLIPHANT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Lift Boosters, of which the following is a full, clear, and exact specification.

My invention relates to air lift boosters. It has for its object to provide an improved booster construction whereby the well may be back-blown and cleaned with great facility, all necessity for removing the booster from the well, removing the cover from the booster, or disconnecting the escape valve connections, being entirely overcome. A further and more specific object of my invention is to provide a booster of an improved and simplified construction whereby, through the provision of a man-hole having a readily removable cover, the eduction pipe is rendered readily accessible whenever it is desired to back-blow the well, and whereby the umbrella top and man-hole cover may be readily removed as a unit without any necessity for removing the booster cover or disturbing any of the other booster elements.

In the accompanying drawings, I have shown for purpose of illustration two embodiments which my invention may assume in practice.

In these drawings,—

Figure 1 is a vertical sectional view of a booster equipped with my improvement.

Fig. 2 is a plan view of the booster shown in Fig. 1.

Fig. 3 is a detail sectional view of a modified form of construction.

In the illustrative construction shown in Figs. 1 and 2, it will be noted that air is supplied through a suitable down pipe 1, to a suitable air lift pump located in the well, and that the mixture of air and liquid produced by the pump passes up into the booster casing 2 through a suitable eduction pipe 3 which opens beneath the usual umbrella top 4. As usual, the air and liquid also is separated within the booster casing so that the liquid passes out under a baffle plate 5 to a discharge pipe or line 6, while the air is maintained in the desired quantity at the top of the booster casing or discharged through a suitable line 7 as a result of the action of an escape valve 8 carried on the cover 9 of the booster casing and preferably controlled by a suitable float 10 disposed within the booster.

In my improved construction illustrated in these figures, it will be noted that the cover 9 of the booster casing, which is bolted to the latter by a series of bolts or screws 11, is provided with an aperture or man-hole 12 directly over the open end of the eduction pipe 3, and that this man-hole 12 is normally covered by a removable cap or man-hole cover 13 suitably removably attached, as by a small number of screws or bolts 14, to the cover 9 of the booster casing 2. In a preferred form of my invention, the umbrella top 4 is so attached to this removable cover 13 as to be bodily removable therewith upon removal of the screws or bolts 14. If desired, this top 4 may be formed integral with the man-hole cover 13 or, as shown herein, formed separate therefrom and connected thereto through an axially disposed threaded connection 15. It will also be observed that, in the central type pump shown in these figures, the down pipe 1 is suitably threaded to the cover 13 at 16 so that it also may be withdrawn bodily from the booster casing with the umbrella top 4 and man-hole cover 13, and separated from the former when desired. As shown, this pipe 1 also preferably opens into a suitable vertically disposed passage 17 in the man-hole cover, the passage 17 in turn communicating with an upper removable section 18 of the down pipe 1, likewise threaded into the cover 13. Here, however, it should be understood that a single length of pipe may be used when desired. Attention is also directed to the fact that the eduction pipe 3 carries on its upper end a threaded collar 19 adapted to use in connecting the back-blowing supply thereto.

In Fig. 3 I have illustrated a modified form of the construction shown in Fig. 1, wherein my improved construction is adapted to use in connection with a pump of other than the central type, that is, to a pump wherein the air supply does not enter through the eduction pipe as in the form shown in Figs. 1 and 2. In this construction, it will be noted that I have illustrated the umbrella top 4 as formed integral with the removable cover plate or man-hole cover 13, as distinct from the two-part threaded construction hereinabove described. Obviously, in this construction it is also possible to remove the cover plate 13 and umbrella top 4

with great facility, and gain ready access to the eduction pipe when it is desired to connect the same for back-blowing.

In the use of my improved construction, it has been found that the operation of back-blowing the well has been greatly facilitated as, through the provision of my improved removable cover plate or manhole cover directly over the eduction pipe, it has been made possible by the removal of a few readily accessible bolts to remove both the cover and the umbrella top bodily in one operation and connect the back-blow supply directly to the eduction pipe without any necessity for removing the booster cover and valve or disconnecting any pipe connections from the latter. Through the adaptation of the same to an installation of the central pump type, it has also been found that the operation of installing or adjusting the pump has been greatly facilitated. These and other advantages of my improved construction will, however, be clearly apparent to those skilled in the art.

While I have in this application specifically described two embodiments which my invention may assume in practice, it will be understood that these forms of the same are shown herein for purposes of illustration and that the invention may be further modified and assume various other forms without departing from its spirit, it being my intention to include all such modifications within the scope of the appended claims.

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

1. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, and a removable cover carried by said first mentioned cover and permitting access to said eduction pipe.

2. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, a removable cover disposed over said pipe, and an umbrella top bodily removable with said removable cover.

3. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, a removable cover disposed over said pipe, an umbrella top bodily removable with said removable cover, and a down pipe likewise bodily removable therewith.

4. In an air lift booster, a booster casing, a cover for said casing, a removable cover carried by said first mentioned cover, and oppositely disposed concentric pipes in said casing, one of the same being bodily removable with said removable cover.

5. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, a removable cover carried by said first mentioned cover and disposed over said eduction pipe, and means for connecting back-blowing mechanism to said pipe.

6. In an air lift booster, a booster casing, eduction and discharge pipes therein, a cover on said casing, valve mechanism supported on said cover, and means for permitting access to said eduction pipe without removing said cover.

7. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, a removable cover carried by said cover and disposed over said eduction pipe, an umbrella top removable with said cover, and means for connecting back-blowing mechanism to said pipe.

8. In an air lift booster, a booster casing, eduction and discharge pipes therein, a cover for said casing, escape valve mechanism carried by said cover, a removable cover carried by said cover and disposed over said eduction pipe, and an umbrella top carried by said removable cover and bodily removable therewith.

9. In an air lift booster, a booster casing, a cover for said casing, a removable cover carried by said first mentioned cover, oppositely disposed concentric pipes in said casing, one of the same being bodily removable with said removable cover, and an umbrella top carried by said removable cover and bodily removable therewith.

10. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, a removable cover disposed over said pipe, an umbrella top removable with said removable cover and detachably connected thereto, and an air supply pipe removable with said removable cover and detachably connected thereto.

11. In an air lift booster, a booster casing, an eduction pipe therein, a cover for said casing, a removable cover disposed over said pipe, an umbrella top disposed concentrically with said eduction pipe and bodily removable with said removable cover, and an air supply pipe disposed concentrically with said umbrella top and bodily removable therewith.

12. In an air lift booster, a booster casing, eduction and discharge pipes therein, a cover for said casing, escape valve mechanism carried by said cover, a removable cover carried by said cover and disposed over said eduction pipe, an umbrella top carried by said removable cover and bodily removable therewith, and means carried on said eduction pipe for attaching back-blowing mechanism thereto.

In testimony whereof I affix my signature.

JOHN OLIPHANT.