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TRAP FOR DREDGER SUCTION PIPE

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Fig. 1

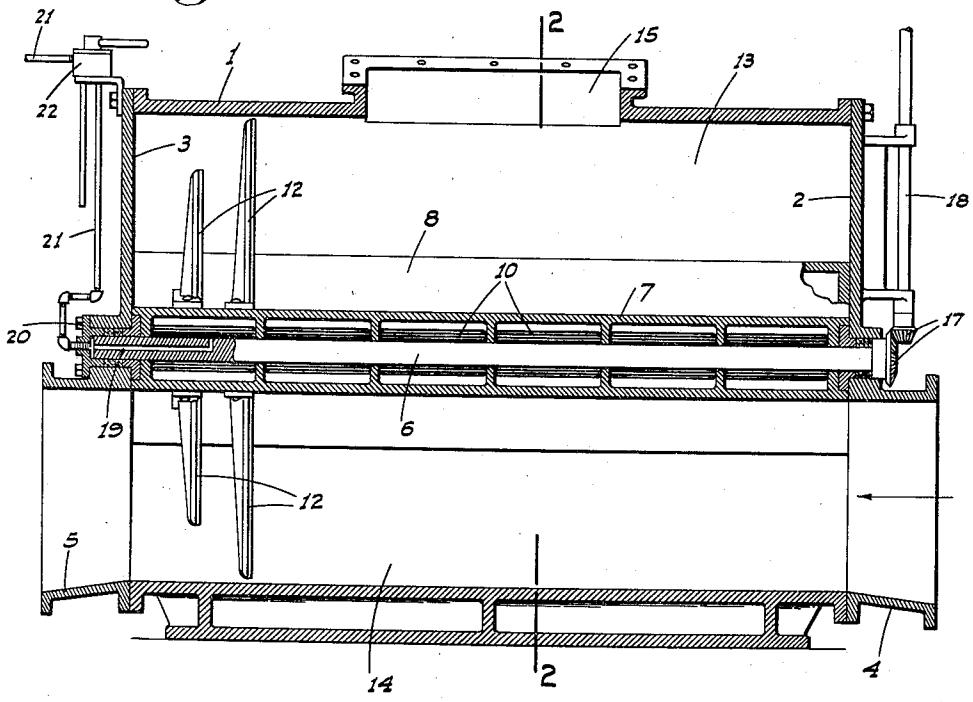
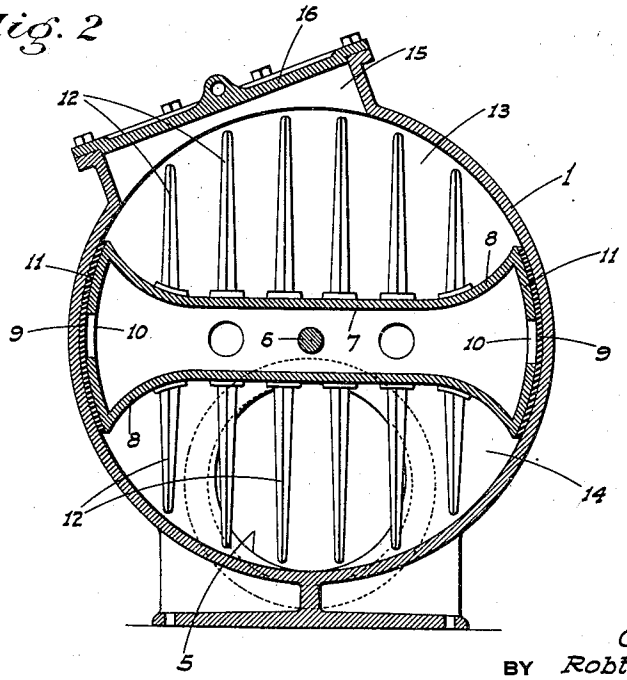


Fig. 2



INVENTORS
Chas. F. York
BY Robt. C. Malmsten
Webster & Webster
ATTORNEYS

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TRAP FOR DREDGER SUCTION PIPE

Charles F. York and Robert C. Malmsten,
Rio Vista, Calif.

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7 Claims. (Cl. 210—167)

This invention relates to a debris trap, and particularly to one designed for use in the suction line of a suction dredger and which under certain operating conditions is apt to bring up rocks, logs and other debris ordinarily incapable of passing through the pump.

The principal object of our invention is to provide a debris trap for the purpose so constructed that it may be cleaned out when necessary without stopping the pump and without loss of the necessary vacuum in the suction line. Also of course the device thus saves time in cleaning the pump, and prevents possible damage being done to the same.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a sectional elevation of our improved trap, with the debris-removal manhole cover removed.

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

Referring now more particularly to the characters of reference on the drawing, the trap comprises a horizontal cylindrical body 1 having end heads 2 and 3 provided below the center of the body with short tubular intake and discharge members 4 and 5, respectively, adapted for connection with the separated sections of the suction pipe of a dredger.

Journaled in and extending between the end heads axially of the body is a shaft 6 on which is fixed a hollow diametrally extending rotor or division wall 7. This extends the full length of the body and has a close fit with the heads so as to be pressure tight. At the side wall of the body, the rotor is increased in width circumferentially of the body as at 8, and these widened portions are curved concentric with the body and are faced with rubber sheeting 9 or other nonporous flexible materlal having a running fit in the body.

Openings 10 in the circumferential wall portions 11 of the enlargements 8 give access to the interior of the rotor 7 and expose the corresponding portions of the rubber sheeting, for the purpose which will be seen later.

Adjacent the discharge-end head 3 of the trap, the rotor on both sides is provided with sets of debris-trapping grate bars 12, one set at a time of which is disposed in front of the discharge passage member 5.

The rotor is disposed so that wall 7 is horizontal when in operation, and it will thus be seen that the body is divided by said rotor or wall into separated upper and lower chambers 13 and 14, the lower one affording direct communication between passage members 5 and 5, while the upper chamber is shut off from said members. The body at the top of the upper chamber is provided with an manhole 15 normally closed by a cover 16.

From the above description it will be seen that if debris, trapped by the lower bars 12, accumulates in chamber 14, rotation of the rotor 7 through a half turn will transfer such debris to the upper chamber, from which it may be removed through the manhole. At the same time, the other set of grate bars then becomes disposed in a trapping position.

The rotor is thus turned by suitable means, such as bevel gearing 17 applied to one end of shaft 6 beyond the trap and operated manually or by power from an actuating shaft 18 extending radially of the body.

In order to insure a pressure tight seal being had between the rotor and body when the manhole cover is removed, and which of course admits air which would destroy the vacuum in the pipe if such a seal were not provided, the rubber facing 9 is pressed firmly against the body. This is accomplished in the following manner: A passage 19 is drilled into the shaft from one end thereof and communicates with the interior of the rotor. A cap 20 on end head 5 encloses this end of the shaft, and a pressure pipe 21 is connected to said cap. Interposed in said pipe, preferably near the trap, is a control valve 22 so that fluid under pressure may be admitted to the rotor and then exhausted therefrom by the operator. This pressure within the rotor acts on the rubber exposed through openings 10 and presses the same firmly and in a pressure tight manner against the wall of the body.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure

from the spirit of the invention, as defined by the appended claims.

Having thus described our invention, what we claim as new and useful and desire to secure by Letters Patent is:

1. A debris trap comprising a cylindrical body adapted to be horizontally disposed in a pipe line and having water intake and outlet openings at its ends and below its horizontal axis, a rotatable division wall in the body symmetrically disposed relative to the horizontal axis thereof and dividing the body into separate upper and lower chambers, means mounting the wall for rotation, means to rotate the wall, debris trapping elements projecting vertically from opposite faces of the wall; the upper chamber having a debris removal opening and a removable closure for said opening.

2. A trap as in claim 1, in which said trapping elements are in the form of sets of grate bars disposed near the water outlet end of the body only.

3. A debris trap comprising a cylindrical body adapted to be horizontally disposed in a pipe line and having water intake and outlet openings at its ends and below its horizontal axis, a rotatable division wall in the body symmetrically disposed relative to the horizontal axis thereof and dividing the body into separate upper and lower chambers, means mounting the wall for rotation, means to rotate the wall, debris trapping elements projecting vertically from opposite faces of the wall; the upper chamber having a debris removal opening, a closure for said opening and means to create a pressure tight seal between the side wall of the body and the adjacent surfaces of the wall.

4. A debris trap comprising a cylindrical body adapted to be horizontally disposed in a pipe line and having water intake and outlet openings at its ends and below its horizontal axis, a rotatable division wall in the body symmetrically disposed relative to the horizontal axis thereof and dividing the body into separate upper and lower chambers, means mounting the wall for rotation, means to rotate the wall, debris trapping elements projecting vertically from opposite faces of the wall; the upper chamber having a normally closed debris removal opening, flexible and non-porous material secured on the sides of the wall and fitting between the wall and body and means to force said material intermediate its top and bottom edges against the body.

5. A debris trap comprising a cylindrical body adapted to be horizontally disposed in a pipe line and having water intake and outlet openings at its ends and below its horizontal axis, a rotatable division wall in the body symmetrically disposed relative to the horizontal axis thereof and dividing the body into separate upper and lower chambers, means mounting the wall for rotation, means to rotate the wall, debris trapping elements projecting vertically from opposite faces of the wall; the upper chamber having a normally closed debris removal opening, rubber facings secured on the sides of the wall and fitting between said wall and the body, the wall being hollow and having openings exposing the rubber intermediate its top and bottom edges and means to admit fluid under pressure to the interior of the wall.

6. A trap as in claim 5, in which the wall mounting means comprises a shaft, and said last named means comprises, with a passage in said shaft extending from one end thereof to a termination within the hollow wall, a fixed closure on the body over said end of the shaft, a fluid pressure pipe connected to said closure and a control valve interposed in said pipe.

7. A debris trap comprising a cylindrical body adapted to be disposed in a pipe line, a rotatable division wall in the body symmetrically disposed relative to the longitudinal axis thereof and dividing the body into separate longitudinally extending chambers, the body having water intake and outlet openings at opposite ends communicating with one chamber, means mounting the wall for rotation, means to rotate the wall, debris trapping elements projecting from opposite faces of the wall in a plane substantially at right angles to said longitudinal axis of the body; the other chamber having a debris removal opening and a removable closure for said opening.

CHARLES F. YORK.
ROBERT C. MALMSTEN.