E. BARTHOLOMEW.

GATHERING HEAD FOR DREDGES.

APPLICATION FILED DEC. 4, 1913.

1,144,406.

Patented June 29, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

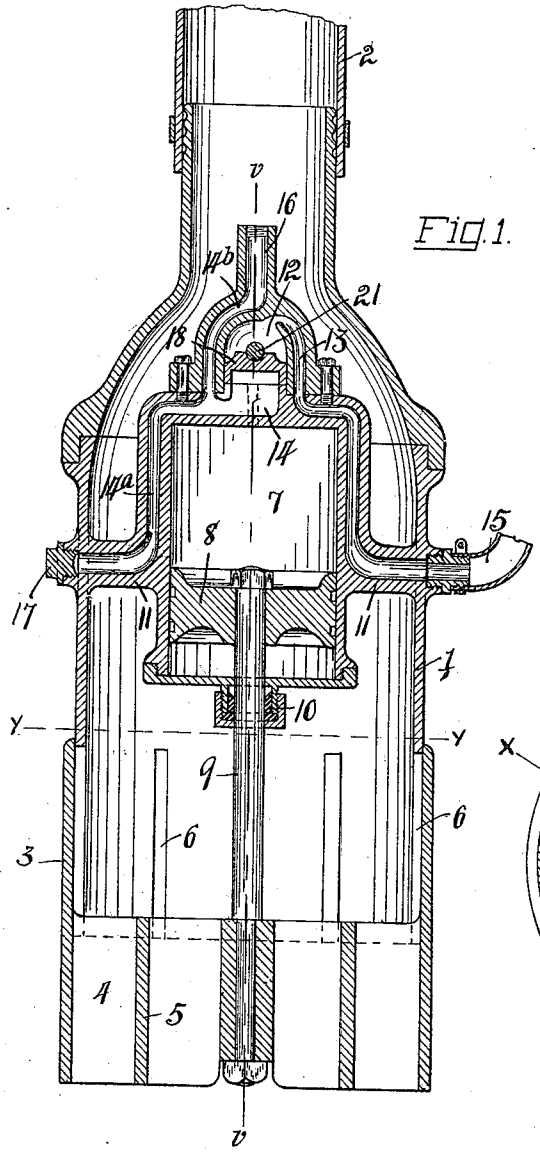
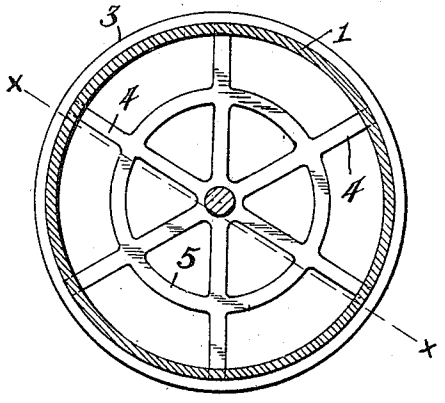


Fig 2.



WITNESSES

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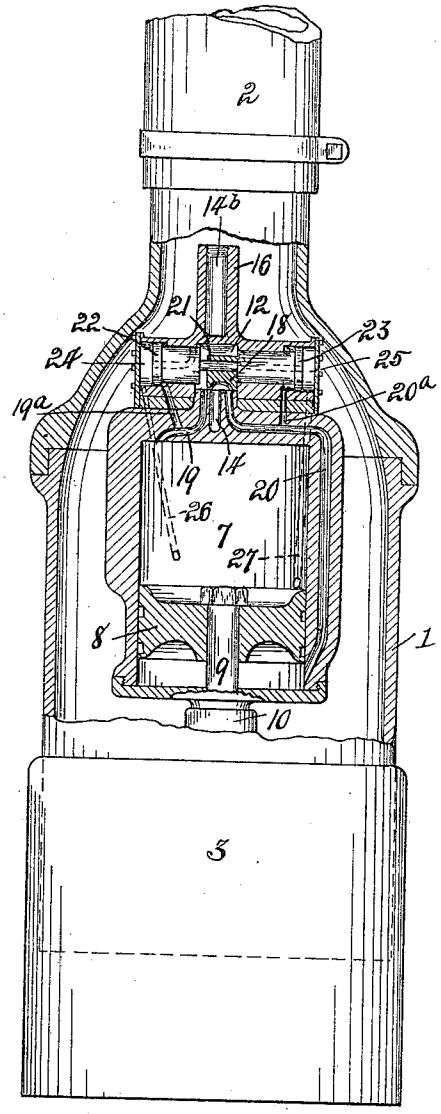
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Fig. 3



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UNITED STATES PATENT OFFICE.

ELLIS BARTHOLOMEW, OF TOLEDO, OHIO, ASSIGNOR TO THE NATIONAL PEAT REFINING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF DELAWARE.

GATHERING-HEAD FOR DREDGES.

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Application filed December 4, 1913. Serial No. 804,713.

To all whom it may concern:

Be it known that I, ELLIS BARTHOLOMEW, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Gathering-Head for Dredges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to dredging and excavating apparatus of the pneumatic or suction type, but is not restricted to such use; and it has particular reference to the provision of improved agitating or material chopping and loosening means at the intake end of the gathering-head or suction conduit, whereby to enhance the practicability and commercial value of apparatus of this character.

The invention is particularly designed and intended for use in connection with the gathering of material of a loose, soft or semi-soft nature, such for instance, as peat, which is of such a character as to very materially facilitate the gathering of such materials.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a central vertical section of an apparatus embodying the invention taken substantially on the line *x*—*x* in Fig. 2. Fig. 2 is a cross-section thereof on the line *y*—*y* in Fig. 1, and Fig. 3 is a side elevation thereof with a portion in section on the line *v*—*v* in Fig. 1.

Referring to the drawings, 1 designates a hollow suction head, which has its inner end restricted, in the present instance, and connected to a suction conduit 2 which may lead to any suitable point for the delivery of the material being acted on, and also have communication with any suitable means for creating a vacuum or suction action therethrough, as is well understood in the art. The head 1 is preferably of cylindrical shape in cross-section and is telescoped at its outer or intake end by a sliding sleeve member 3, which is provided interiorly thereof at its outer end portion with a plurality of radially disposed webs 4 forming cutter-knives. These webs are also shown as being connected intermediate their ends by a circular web portion 5, which is disposed in concentric spaced relation to the sleeve 3 and coöperates with the webs 4 and the outer edge of the sleeve 3 to chop up or disintegrate the material on which it acts, as hereinafter described. The outer end of the head 1 is provided with longitudinally-extending slots 6 in register with the respective webs 4 for such webs to work in.

Mounted within the inner end portion of the head 1 in spaced relation to its wall is a cylinder 7, the axis of which is disposed longitudinally of the head, and in which works a piston 8, the piston-rod 9 of which extends outwardly therefrom through a stuffing-box 10 in the lower or outer end of the cylinder and connects to the central or hub portion of the cutter webs 4. It is thus evident that a movement of the piston 8 within the cylinder 7 will impart corresponding reciprocatory movements to the cutter member 3, 4, 5. Spaced connecting parts 11 are provided between the walls of the head 1 and cylinder 7 to support the latter in relative rigid relation to the former in such a manner as to permit the passage of material through the head around the cylinder.

Provided, in the present instance, on the inner end portion of the wall forming the cylinder 7 is a fluid chest 12 having a fluid intake passage 13 and an exhaust passage 14. The inlet passage 13 extends down through the wall of the cylinder 7 and one of the connecting parts 11 and has connection at its outer end with a hose or tube 15 leading to any suitable source of fluid pressure supply. The exhaust passage 14 is provided, in the present instance, with two outlet branches 14^a and 14^b, one of which leads down through a wall of the cylinder 7 and thence outward through one of the connections 11, while the other leads upward from the port 14 through the wall of the steam-chest 12 and terminates in a discharge nozzle 16 for directing the exhaust longitudinally through the suction conduit 2. A plug 17 is provided for threading into and closing the outer end of either of the branch exhaust passages 14^a, 14^b, as it may be desired to direct all of the exhaust

through one or the other thereof, or both branches may be left open so that the exhaust is distributed and passes through both of the branches. By discharging the exhaust into the conduit 2 the suction action within such conduit is augmented, as will be apparent.

A D-valve 18 is slidably mounted in the chest 12, and serves to alternately connect the cylinder inlet ports 19 and 20 with the exhaust port 14. The D-valve 18 is mounted upon a valve-rod 21, which is slidably disposed longitudinally therethrough and which is enlarged at its opposite ends for the purpose of abutting the ends of the D-valve and actuating the same. The enlargements at the ends of the valve-rod are slidably disposed in chambered portions formed in the opposite ends of the steam-chest 12 and are provided with valve heads 22 and 23, which reciprocate within enlarged channel portions 24 and 25, respectively, at the adjacent ends of the chest. The ports or fluid supply passages 19 and 20, which extend from the chest 12, terminate at their outer ends within the cylinder 7, one at each end thereof, as shown in Fig. 3. The passages 19 and 20 have by-passes 19^a and 20^a, respectively, leading therefrom to the inner ends of the respective channel portions 24 and 25, at the outer ends of the chest 12 in which the valve enlargements 22 and 23 work. The outer ends of the channel portions 24 and 25 have passages 26 and 27, respectively, leading therefrom and communicating at their opposite ends with the interior of the cylinder 7. The cylinder end of the passage 26 is disposed in proper position to be uncovered by the lower end of the piston 8 when it is near the limit of its upward stroke, while the cylinder end of the passage 27 is disposed in position to be uncovered by the upper end of the piston when near the limit of its downward stroke. While I have shown and described a particular form of means for controlling the admission of fluid to the cylinder for operating the piston 8, it will be understood that the invention is not restricted to the use of such means, as any suitable fluid controlling means may be employed for such purpose.

In the operation of my invention the suction head 1 is placed with its open end in material-cutting position, as is customary with gathering devices of this character, and steam or other fluid pressure is then directed into the distributing chest 12 through the tube 15 and passage 13 from whence it is alternately discharged into opposite ends of the cylinder 7 to impart reciprocatory movements to the piston 8 in a manner well understood in the art. The rapid reciprocatory movements which are thus imparted to the piston 8 cause corresponding rapid chopping movements to be imparted to the chopping or agitating means 3, 4, 5, thereby breaking up and disintegrating the material being acted on to facilitate a drawing of the same through the head 1 and conduit 2 by suction or vacuum action. If desired the whole or a portion of the exhaust piston operating fluid may be discharged through the exhaust passage 14^b into the conduit 2 in the direction of movement of the material therein to augment or facilitate the movement of the material through such conduit, or, the plug 17 may be placed in the passage 14^b to close the same, and the passage 14^a left open for the discharge of all of the exhaust fluid therethrough externally of the suction head.

It will be understood that any form of fluid under pressure, such for instance, as steam, water or air, may be utilized for driving the piston 8, and also that the invention is not limited to any specific form, construction or arrangement of the parts except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent is,—

1. In combination, a gathering head, an agitating member sleeved to the intake end of said head for reciprocatory movements longitudinally thereof, and means for reciprocating said member.

2. In combination, a gathering head, an agitating member sleeved to the intake end of said head for reciprocatory movements relative thereto and having interior web-like cutting parts, and means for reciprocating said member.

3. In combination, a gathering head, an agitating member sleeved to the intake end of said head for reciprocatory movements relative thereto, and means within the head connected to said member and operable by fluid pressure to reciprocate the member relative to the head.

4. In combination, a gathering head, an agitating and cutting member at the intake end of said head, and fluid actuated means within the head operated by fluid pressure to impart reciprocatory movements to said member.

5. In combination, a gathering head of the character described, material-chopping means carried at the intake end of said head for linear reciprocatory movements relative thereto, and fluid actuating means mounted within said head in connection with and for imparting reciprocatory movements to said chopping means.

6. In combination, a gathering head, agitating means movably carried at the intake end of said head, and fluid actuated means for imparting movements to said agitating means and having its fluid exhaust into a

portion of said head for creating a suction action therein in the direction of movement of matter therethrough.

7. In combination, a gathering head, an agitating member at the intake thereof, fluid actuated means within the head for imparting movements to said agitating means, and control means operable to cause the fluid exhaust to take place either through the head in the direction of movement of matter therethrough or exteriorly of the head.

8. In combination, a gathering head having a movable agitating part at its intake end, fluid actuated means within the head for imparting agitating movements to said part, said actuating means having a fluid exhaust passage which is branched with one branch opening into the passage through the head in the direction of movement of matter therethrough and the other branch opening without the head.

9. In combination, a gathering head having a movable agitating part at its intake end, fluid actuated means within the head for imparting agitating movements to said part, said actuating means having a fluid exhaust passage which is branched with one branch opening into the passage through the head in the direction of movement of matter therethrough and the other branch opening without the head, and means for closing either of said exhaust passage branches.

10. In combination, a gathering head having a movable agitating part at the intake end thereof, a cylinder within said head in spaced relation to the wall thereof, spaced connections between the walls of said cylinder and head for supporting one within the other, a piston operating in said cylinder, connection between said piston and agitating part for communicating movements from one to the other, and means for controlling the admission of fluid to said cylinder for operating said piston, said means having a fluid intake passage through one and a fluid exhaust passage through another of said connections between the walls of the cylinder and head.

11. In combination, a gathering head having an intake end which is cylindrical in cross-section and longitudinally slotted, an agitating member sleeved to the intake end of said head for reciprocatory movements relative thereto and having webs, a part at least of which work in the slotted portions, and fluid pressure means for actuating the reciprocatory movements of said agitating members.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

ELLIS BARTHOLOMEW.

Witnesses:
S. T. KLOTZ,
F. E. AUL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."