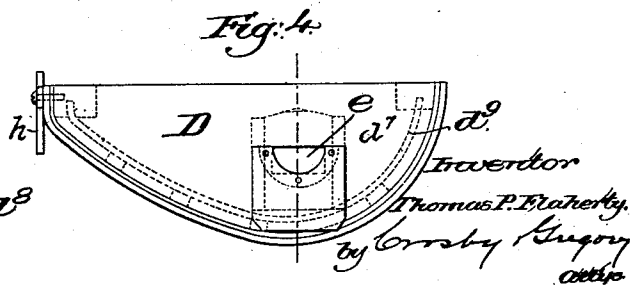
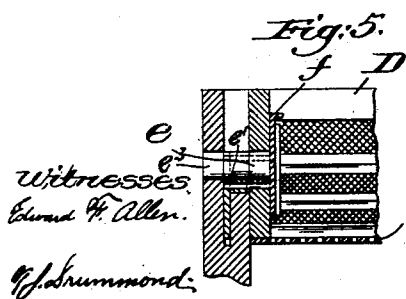
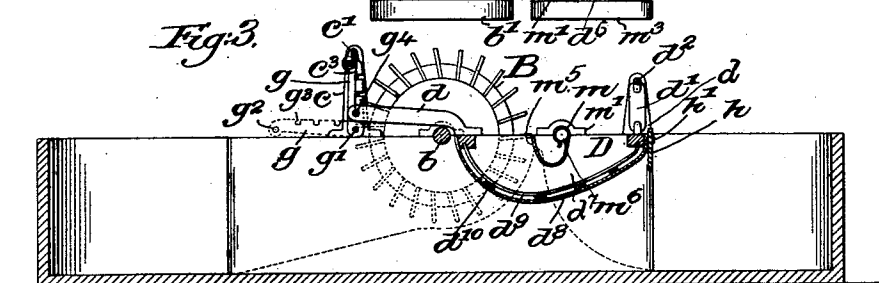
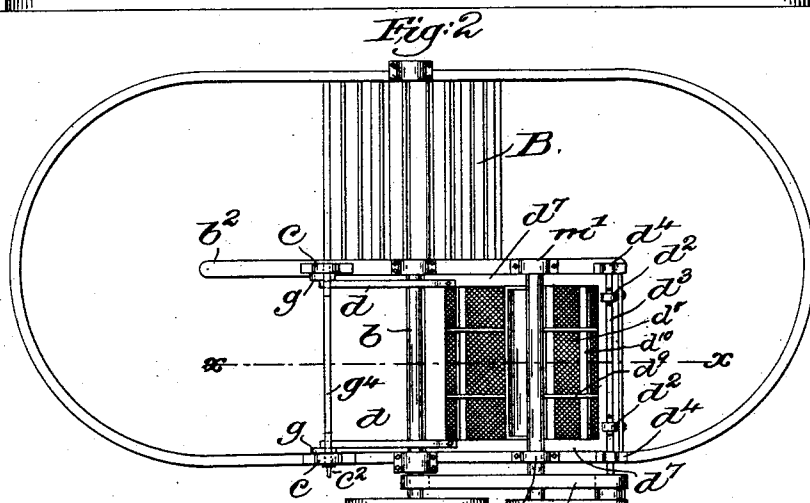
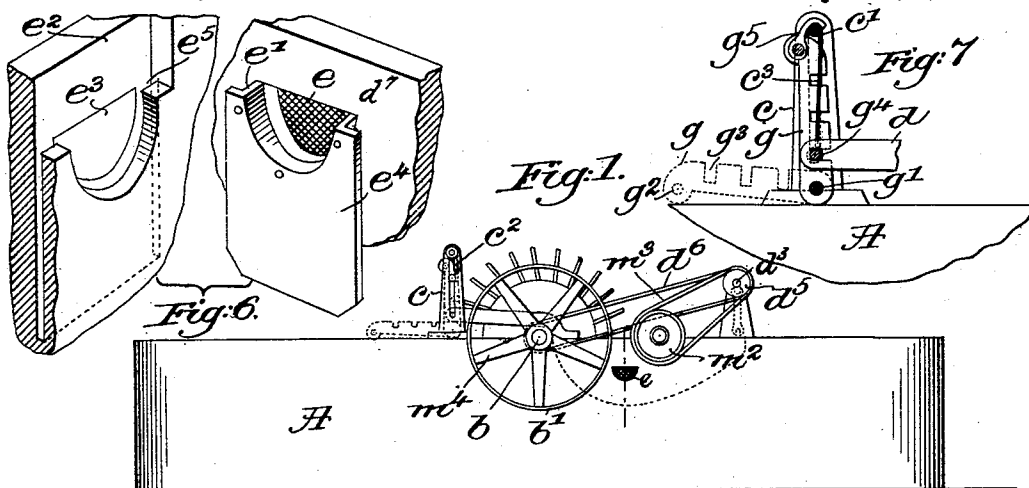


(No Model.)

T. P. FLAHERTY.
BEATING ENGINE.

No. 586,382.

Patented July 13, 1897.



UNITED STATES PATENT OFFICE.

THOMAS P. FLAHERTY, OF COVENTRY, CONNECTICUT.

BEATING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 586,382, dated July 13, 1897.

Application filed June 27, 1895. Serial No. 554,181. (No model.)

To all whom it may concern:

Be it known that I, THOMAS P. FLAHERTY, of Coventry, county of Tolland, State of Connecticut, have invented an Improvement in Beating-Engines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention in rag-beating engines has particular reference to means for removing the surplus dirty water from the tank.

In accordance with my invention I mount in the tank, preferably at that side opposite the grinder, what I call a "cradle," having a perforated bottom, which by suitable means is given a vertical vibrating or reciprocatory motion, which, acting upon the pulp in the tank, causes the surplus or dirty water to flow through the perforated bottom into the cradle, from which it is discharged by suitable means.

My invention also comprehends a rotating dipper to remove the water from the cradle.

The above, together with other features of my invention, will be hereinafter described, and pointed out in the claims.

In the drawings illustrating one, the preferred, embodiment of my invention, Figure 1, in side elevation, sufficiently shows a beating-engine of usual type or construction to enable my invention to be understood. Fig. 2 is a top or plan view of the machine shown in Fig. 1; Fig. 3, a vertical section on the dotted line $x x$, Fig. 2; Fig. 4, an enlarged side elevation of the cradle; Fig. 5, a still larger sectional detail of the principal outlet for the cradle with the gate closing the same; Fig. 6, a detail in perspective showing the juxtaposition of the cooperating parts, in broken detail, of the outer tank-wall and cradle, whereby a tight joint is obtained at the outlet, to be described; and Fig. 7, an enlarged detail of means for locking the cradle in its vertical adjustment.

In the particular embodiment of my invention shown in the drawings, A is the usual tank, and B the usual grinder, mounted upon its shaft b , extending completely across the machine and provided at one end with a usual driving-pulley b' .

In accordance with my invention I have

mounted upon the outer wall of the tank and upon the middle partition b^2 thereof and at that side opposite the grinder two standards $c c$, in which is journaled, near their upper ends, the shaft c' , preferably provided with a crank c^2 , by which it may be rotated. From this shaft depend the flexible cords or connections c^3 , (see Fig. 3,) which at their lower ends sustain the rearwardly-extended arm d of the cradle D, which at its opposite end is connected by suitable links d' with a crank d^2 on a shaft d^3 , journaled in suitable bearings in standards d^4 and provided at its outer end with a suitable pulley d^5 , driven by a belt d^6 from the grinder-shaft referred to.

The cradle D, as herein shown, has flat sides d^7 and a curved semielliptic bottom d^8 , shown as perforated, it being preferably finely perforated to exclude everything but liquid. This perforated bottom d^8 is preferably stiffened or strengthened by longitudinal and cross braces $d^9 d^{10}$ at the inside of the cradle. At its outer side the cradle (see Figs. 5 and 6) is provided with an outlet-opening e , and outside the cradle, adjacent this opening, is a laterally-extended neck e' , which enters a corresponding recess e^2 in the side wall of the tank, and in which is an opening e^3 , which in effect forms a continuation of the opening e in the cradle. The neck e' is provided with a laterally and downwardly extended flange e^4 , which works in a suitable recess e^5 in the wall of the tank.

Inside the cradle I have provided a suitable gate f , by which to open and close this outlet e , said gate, as herein shown, having a vertical movement in suitable guideways on the cradle.

The operation of the machine thus far described is as follows, viz: Assuming the machine to be in usual operation, with the grinder in constant rotation, driving the pulp in a circular path around the inside of the tank in the direction of the arrow, Fig. 2, rotation of the grinder-shaft, acting through belt d^6 , will cause rotation of the crank-shaft d^3 , which, through the link d' , will cause up-and-down vibration of the cradle upon or in the surface of the moving pulp. This vertical movement of the cradle causes the surface or dirty water in the pulp to be forced through the perfora-

tions in the cradle-bottom into the cradle, from which it will flow outwardly through the side outlet *e* to waste. The height of the cradle may be adjusted to meet the varying level of the surface of the pulp in the tank by means of the shaft *c*, which may be used to wind or unwind the pawl *c*³, supporting the adjacent end of the cradle and constituting the fulcrum about which the cradle is vibrated. To lock the fulcrum end of the cradle in its adjusted position, I have provided the arms *g*, pivoted to the standards *c* at *g*¹ and connected at their outer ends by rod *g*², said arms being notched along their inner edges, so that when turned into vertical position said notches will engage a rod *g*⁴, connecting the fulcrum ends of the arms *g*, and thereby rock said rod and arms and the adjacent end of the cradle against any but a vibrating movement of the cradle. When it is necessary to adjust the level of the cradle, the arms *g* are turned into their dotted position, Fig. 7, and after adjustment they are returned again to and held in their vertical locking positions by a suitable catch, as *g*⁵. To regulate the flow of pulp under the cradle and to prevent back-splashing, I have provided the moving end of the cradle with what I shall call a "splasher-board" *h*, adjustably connected, as by screws *h*¹ and slots, (not shown,) with the cradle, said board being adjusted as necessary to enable it to fulfil its functions. As an additional means for removing water from the cradle I have provided the hollow shaft *m*, journaled in suitable bearings *m*¹ and provided at its outer ends with a pulley *m*², driven by a belt *m*³ from a pulley *m*⁴ on the grinder-shaft. This power-shaft *m*, immediately over the cradle, is provided for substantially the entire width of the cradle with a curved scoop *m*⁵, within which said shaft is slotted, as at *m*⁶, Fig. 3. Rotation of this hollow shaft and its scoop causes the latter to scoop up in greater or less quantities the water within the cradle, which is discharged through the hollow shaft. At times both the hollow shaft, with its scoop, and the side outlet *e* are necessary to remove in sufficient quantity the water entering the cradle, and at other times either one might be sufficient.

When it is desired to dispense with the action of the cradle, the locking-arms *g* may be thrown down and the fulcrum end of the cradle raised to such a level as to lift the perforated bottom of the cradle above the level of the pulp in the tank, the plate *e*⁴ beneath the side outlet of the cradle at such times serving as a closure to cover the opening *e*³ in the tank-wall to prevent escape of the pulp.

My invention is not limited to the particular embodiment herein shown, for it is evident the same may be varied without departing from the spirit and scope of my invention.

I claim—

1. In a beating-engine the combination with a tank, a beater, a cradle having a pervious surface extending beneath the normal pulp-

line and an outlet-opening, and means to vibrate the same in a vertical path of movement, substantially as described.

2. In a beating-engine, the combination with a tank and a grinder, of a constantly vertically vibrating cradle arranged to remove the surplus water from the tank, and means to vibrate the same in a vertical path of movement, substantially as described.

3. In a beating-engine, the combination with a tank, and grinder, of a cradle arranged above the pulp within said tank, having a perforated bottom, a support for one end of said cradle, an outlet for the removal of water by said cradle, and means to vertically vibrate the other end thereof, substantially as described.

4. In a beating-engine, the combination with a tank, and a grinder, of the cradle arranged to normally vibrate to remove the surplus water from the tank, one or more inlet-openings, and a side outlet therefor for the said removal of the water, substantially as described.

5. In a beating-engine, the combination with a tank, and grinder, of the cradle, adjustable supports for and to vary the height of one end of said cradle, means to vibrate the other end thereof, and an inlet and an outlet for the cradle, substantially as described.

6. In a beating-engine, the combination with a tank, and grinder, of the vibrating cradle, one or more inlet-openings therefor, the side outlet therefor, through the wall of said tank, and the closure on the said cradle, to close said tank-wall outlet when the cradle is raised, and means to raise the cradle, substantially as described.

7. In a beating-engine, the combination with a tank, and grinder, of the vibrating cradle having a curved bottom, and the splasher-board thereon at the upper side of said bottom whereby the splash of the cradle against the flow of the pulp is prevented, one or more inlet-openings and an outlet for the water, substantially as described.

8. In a beating-engine, a tank, a rotating grinder, the cradle having a perforated bottom, its arms, a shaft from which said arms are suspended, and by which they are adjusted, a locking device for said arms to lock them in adjusted position, a crank connected with and to vibrate the opposite end of said cradle and connected with and driven from the grinder-shaft, and an outlet for the water, substantially as described.

9. In a beating-engine, the combination with a vibrating cradle having a suitable inlet-opening, of a side outlet therefor opening near the bottom thereof, means to close said outlet, whereby the normal flow from said cradle is provided for and may be regulated, a scoop arranged to rotate in said cradle above said bottom, means to rotate the same, and a hollow discharge-shaft therefor, whereby, when liquid in the cradle rises above the dip of said scoop, it is automatically removed thereby, substantially as described.

10. In a beating-engine, the combination

with a vibrating cradle, pervious inlet-surface therefor, of an outlet therefor opening near the bottom thereof, means to permit a restricted normal flow of the water from the cradle through said opening, means to close said outlet, whereby said flow may be regulated, a second outlet-opening at or near the top of said cradle, and means to automatically deliver through said second outlet all water that rises above a predetermined level within said cradle, substantially as described.

11. In a beating-engine, the combination with a tank, and grinder, of a cradle arranged above the pulp within said tank, and having a perforated bottom, a support for one end of said cradle, and means to vertically vibrate

the other end thereof, substantially as described.

12. In a beating-engine, the combination with a tank, and grinder, of a cradle arranged to normally vibrate and to remove water from the tank, and a side outlet therefor, for the said removal of the water, substantially as described.

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

THOS. P. FLAHERTY.

Witnesses:

EUGENE A. TRACY,
JOHN H. CLARK.