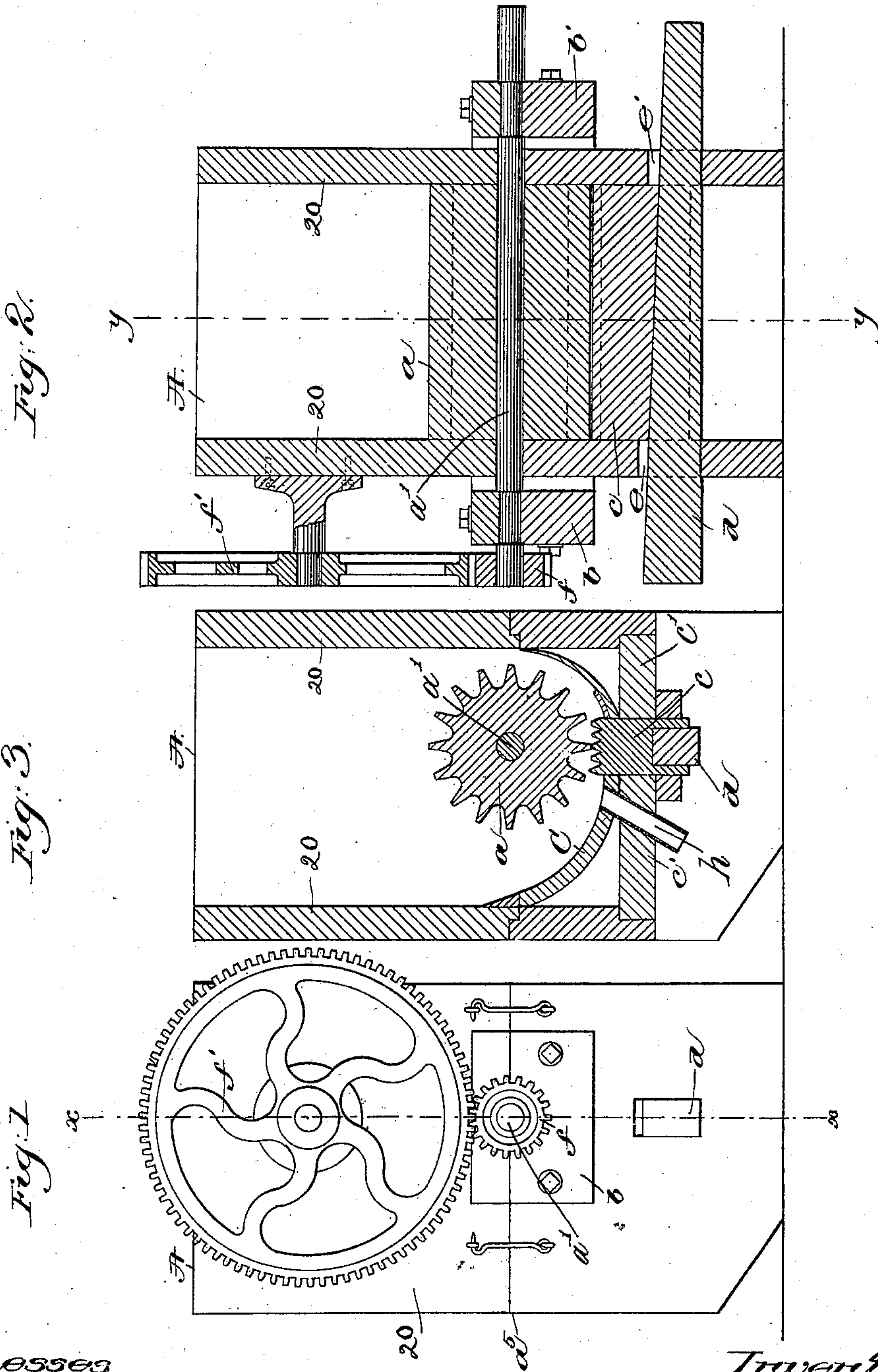


(No Model.)

B. B. TOBIE.  
PULP BEATING ENGINE.

No. 364,687.

Patented June 14, 1887.



Witnesses  
Fred L. Erney  
Arthur Zipperden.

*Inventor*  
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# UNITED STATES PATENT OFFICE.

BYRON B. TOBIE, OF FRANKLIN FALLS, NEW HAMPSHIRE.

## PULP-BEATING ENGINE.

SPECIFICATION forming part of Letters Patent No. 364,687, dated June 14, 1887.

Application filed August 30, 1886. Serial No. 212,205 (No model.)

*To all whom it may concern:*

Be it known that I, BYRON B. TOBIE, of Franklin Falls, county of Merrimac, and State of New Hampshire, have invented an Improvement in Pulp-Beating Engines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Pulp-beating machines now commonly in use have elongated tanks, and the disintegrating or beating devices are located either at one side of the tank or near one end, to thereby establish a current in the material as it is being beaten.

In machines of the class referred to much time is required for all the material contained within the tank to be brought in contact with the beating devices, and consequently the operation of beating is very slow; and such tanks are further objectionable, because the material lodges at certain points and is not acted upon by the beating devices, thereby causing much trouble in the further processes of making paper, &c.

In my experiments to improve pulp-beating machines I have discovered that the time required to disintegrate or beat the stock into pulp may be materially shortened by submerging the beating devices in a deeper column of pulp, that they may be run at higher speed, and to accomplish this I have diminished the area in cross-section of the tank of the beating-machine and have extended the sides of the tank upward, the cutting or grinding cylinder extending substantially the length of the tank, and to obviate lodging of the pulp in any corner I have made the bottom of the tank over which the pulp travels concave.

My invention in pulp-beating machines consists, essentially, of an upright tank or receptacle of comparatively small area in cross-section, having a concaved bottom, combined with disintegrating or beating devices located at the lower end of the tank and extended horizontally therein. Suitable devices are employed for adjusting the cutting or grinding bed and the cylinder with relation to one another.

Figure 1 in end elevation shows a pulp-beating engine embodying this invention; Fig. 2, a vertical section of Fig. 1, taken on the

dotted line  $xx$ ; and Fig. 3, a vertical section of Fig. 2, taken on the dotted line  $yy$ .

A represents my improved upwardly-extended or high-column tank or receptacle, of very considerably smaller area in cross-section than heretofore common in this class of apparatus, said tank being composed of side walls, 20, made either in flat sections, to form a quadrangular tank, or in curved sections, or a single piece, to form a tank having curved side walls.

The tank A in cross-section will in practice be preferably rectangular.

The devices instrumental in disintegrating or beating the pulp consist of a cutting or grinding cylinder,  $a$ , secured to a shaft,  $a'$ , journaled in suitable boxes,  $b b'$ , and a co-operating cutting or grinding bed,  $c$ , seated in the bottom plate, C, of the machine, the said grinding-cylinder and bed extending horizontally substantially across the lower portion of the said tank A.

The tank A is provided with a concaved wall or bottom plate, C, to insure more uniform feeding of the material to the beating devices and to prevent lodging.

The cutting or grinding bed  $c$  is herein shown as adjustable vertically by means of a bar,  $d$ , having an inclined top surface, upon which the bed  $c$  rests, the said bar  $d$  moving in slots  $e e'$  cut in the uprights supporting the tank A. A pinion,  $f$ , is mounted upon the shaft carrying the cutting or grinding cylinder  $a$ , said pinion being positively rotated by a toothed gear,  $f'$ , it in turn being rotated in any usual or suitable manner; but it is obvious that the cutting or grinding cylinder may be positively rotated by any other suitable means.

The pulp material, cut or chipped in any usual manner, or it may be, if desired, crude material, is placed in the tank or receptacle A, together with a suitable supply of water, and the beating devices operated, and as the material is beaten the cutting or grinding bed is gradually raised by moving the bar  $d$ .

By employing a tank of the shape described and providing the same with beating or disintegrating devices extending substantially across the lower portion of the tank the material is caused to come in quicker contact



with the disintegrating devices, so that the operation of beating is greatly increased, thereby increasing the capacity of work for each engine, and the material has no chance or place to lodge, and thereby escape, being acted upon by the beating devices. The tank is divided at  $a^5$ , so that the top portion may be taken off when it is desired to remove the cylinders  $a$ .

The outlet  $h$  enables the tank to be emptied, and the outlet  $h'$  serves when "washing up;" but it is obvious that any other suitable outlet may be employed for this purpose.

I am aware that a pulp-beating machine has been devised comprising a high pulp-holding vessel with the disintegrating devices on the bottom thereof; but said vessel consisted of an outer shell and an inner shell, the material being contained therein, and the disintegrating devices were arranged but part way across the bottom of the vessel, so that much time was consumed in disintegrating the material.

I claim—

1. In a pulp-beating machine, an upwardly-extended tank, A, to contain a high column of pulp, said tank being composed of side

walls, 20, but having no interior construction, combined with disintegrating or beating devices consisting of a cutting or grinding cylinder,  $a$ , and bed  $c$ , located at the lower end of the tank A and extending horizontally for substantially the entire length of the tank, substantially as and for the purpose described.

2. In a pulp-beating machine, an upwardly-extended tank, A, to contain a high column of pulp, said tank being composed of side walls, 20, but having no interior construction, and having a concaved bottom, C, combined with disintegrating or beating devices consisting of a cutting or grinding cylinder,  $a$ , and bed  $c$ , located at the lower end of the tank A and extending horizontally for substantially the entire length of the tank, substantially as and for the purpose described.

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

BYRON B. TOBIE.

Witnesses:

FRANK PROCTOR,  
ALEXIS PROCTOR.