

(No Model.)

F. A. CLOUDMAN.
CENTRIFUGAL MACHINE.

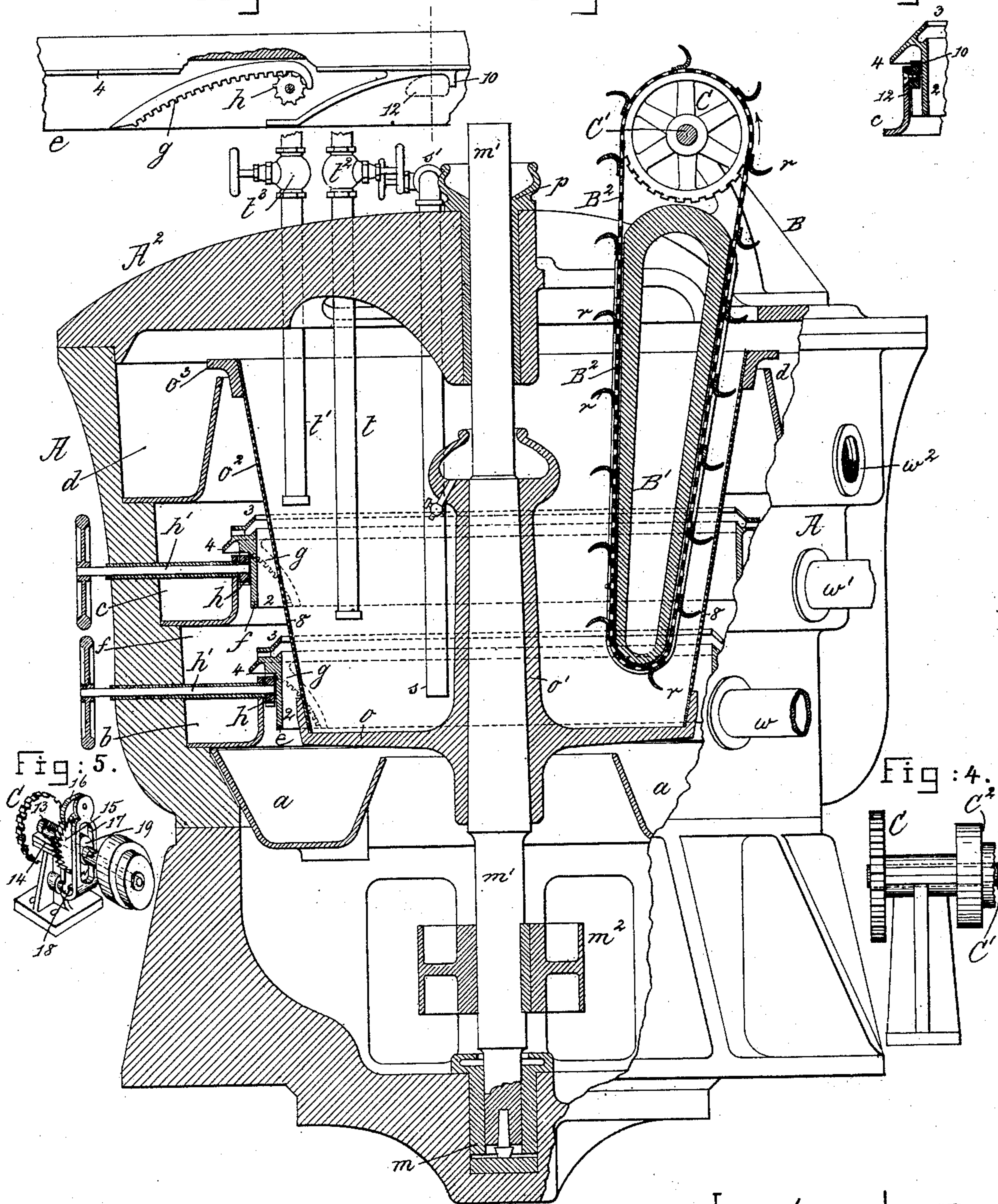
No. 328,190.

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Fig:2.

Fig:1.

Fig:3.



Witnesses.

Arthur Lippert.
Fred L. Emery.

Inventor.

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UNITED STATES PATENT OFFICE.

FRANCIS A. CLOUDMAN, OF CUMBERLAND MILLS, MAINE.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 328,190, dated October 13, 1885.

Application filed July 27, 1885. Serial No. 172,742. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. CLOUDMAN, of Cumberland Mills, county of Cumberland, State of Maine, have invented an Improvement in Centrifugal Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of an apparatus by which to dry all kinds of loose fiber, crystals, &c., and to wash the same.

In accordance with my invention fibrous material treated chemically or otherwise for the production of paper pulp or fiber is run into my improved centrifugal machine where, during the rapid rotation of the basket, the liquor is discharged laterally from holes in the basket into a trough. An endless chain or belt provided with blades moves the material vertically in the basket, and during the upward movement of the material water in limited quantity is discharged into the partially-dried mass and quickly discharged from it by centrifugal action into a separate trough, thus washing the fiber or material, and finally the belt discharges the fiber or material over the top of the basket while the latter is in rapid rotation, thus effecting a drying, washing, and discharging operation while the machine is in rotation.

Figure 1 in vertical section illustrates a centrifugal machine embodying my improvements; Figs. 2 and 3, details of the trough, and adjustable curbs; Fig. 4, a detail of the belt or chain moving sprocket-wheel and devices for rotating it, and Fig. 5 a modified form of driving device for the chain or belt.

The casing A—a strong shell of cast metal supported on a flooring or timbers (not shown)—has mounted in it a series of troughs or pans, *a b c*, and a receiver, *d*, one above the other. Two of the pans, *b c*, have adjustable curbs, marked *e f*, each curb being composed, essentially, of an annulus, 2, having an attached double flange, 3 4, each annulus having attached to it the part *g* of a curb-adjusting device, said part being shown as a curved rack, the other member being shown as a pinion, *h*, and a rod, *h'*, provided with a hand-wheel, rotation of the rod or gear causing the pinion en-

gaging the rack to move the curb in the arc of a circle and at the same time upward or downward, according to the direction of rotation of the pinion, the curb being made adjustable, so as to direct the liquors thrown off from the fiber or material, the liquors being of different strength or specific gravity, into one or the other trough, as may be desired.

Each curb is provided with a hook, 10, (see Fig. 2,) which, when the curb is in its lowest position, engages a lug, 12, (shown by dotted lines, Fig. 2,) fast to the trough surrounding the said curb, the lug acting as a stop to hold the curb in place.

The foot step or bearing *m*, for the reception of the foot of the spindle *m'*, is and may be of any usual construction common to centrifugal machines. The spindle *m'*, provided with a pulley, *m''*, to receive a belt by which to rotate the spindle and its attached basket, (shown as composed of the flanged bottom plate, *o*, having a sleeve, *o'*, and the perforated metallic side walls, *o''*, and the rim *o'''*,) is also supported by or has bearing in a bolster, *p*, in the cover *A'* of the casing.

The metal of the basket and other parts coming in contact with the liquor thrown from the fiber may be coated with some anti-corrosive substance.

The curb has erected upon it a stand, *B*, which holds a guide, *B'*, for the chain or belt *B''*, having blades *r r*, and extended over a sprocket or other suitable wheel, *C*, on a rotating shaft, *C'*, mounted in the said bracket, the said shaft having a pulley, *C''*, which in practice will receive a belt by which to rotate the sprocket-wheel at a speed to secure for the chain or belt the proper speed of movement in the direction of the arrow near it in Fig. 1.

It will be understood that the sprocket-wheel may, if desired, be rotated intermittingly instead of continuously. To do this the sprocket-wheel *C* (see Fig. 5) will be attached to a sleeve, 13, placed in the bearing 14, and provided with a ratchet-wheel, 15, the said ratchet-wheel being engaged by a pawl, 16, in a pawl-carrier, 17, pivoted at 18 on the bracket supporting the said bearing, and the said pawl-carrier will be vibrated by an eccentric, 19, fast on the shaft, the latter in this modification taking its bearing in the sleeve 13, the

shaft rotating, but being restrained from longitudinal movement, in the said sleeve.

If desired, the guide B' may be provided at its lower end with a friction wheel or sheave to avoid friction between it and the chain or belt.

The liquid discharged from the basket below the top of the lip of the flange of the curb of the trough *b* is directed by the said curb into the trough *a*, and the liquid thrown off through the basket between the curb *e* and *f* is made to enter the trough *b*, and that above the curb *f* to enter the trough *c*, while the fiber or material freed from liquid is gradually lifted by the blades and discharged over the rim C³ into the receiver *d*.

The cover A² has an opening for the chain or belt B² and for several pipes, to be described.

The material to be deprived of its liquid, whether it be paper pulp, stock, or fiber, or crystals, or other materials commonly dried in centrifugal machines, is let into the basket while the latter is running rapidly, preferably at the velocity established for it, through a pipe, *s*, the gate *s'* being opened for the purpose, and entering the basket the material is thrown rapidly against its perforated wall, the liquid therein passing out through the holes in the wall of the basket into the trough *a*. During this time the blades of the chain or belt act gradually to lift the material upward, or to aid its upward travel on the inclined wall of the basket, and in practice as the material arrives at about the point 8 it is nearly dry. At this point, if desired, the washing of the material may be commenced by means of water discharged through the pipes *t t'*, having valves *t² t³*, the water striking the material spread gradually higher and higher upon and held in place by centrifugal action against the inner wall of the basket, passing quickly through the said material and washing it, the weaker liquid so discharged being received in the troughs *b* and *c*.

This machine may be supplied continuously and be continuously discharged.

I do not desire to limit my invention to the

treatment of only paper-stock, but may use it for various other purposes when materials of different specific gravity or density are to be separated by centrifugal action.

The casing opposite each trough *g'* is provided with outlets *w w' w²* for water or other liquid.

I claim—

1. In a centrifugal machine, a rotating spindle and perforated basket and a movable chain or belt having blades acting to elevate the more solid contents of the basket vertically along the sides of the basket toward its top where the said material is discharged, substantially as described.

2. The rotating spindle and perforated centrifugal basket, combined with an annular trough having an adjustable curb, to operate substantially as described.

3. The rotating spindle and perforated centrifugal basket and one or more surrounding liquid-receiving troughs, combined with a traveling chain or belt having blades to lift the more solid material in the basket, and with the trough or pan *d* to receive the said material discharged over the top of the basket, substantially as described.

4. In a centrifugal machine, the rotating spindle, the perforated basket, the pipe to feed the basket with material to be dried and washed, and the troughs *a b*, combined with the water-supply pipe to discharge water upon the partially or nearly dry material to wash the same, substantially as described.

5. In a centrifugal machine, the spindle and perforated basket and the annular trough *b* and the curb, combined with adjusting mechanism, substantially as described, to raise or lower the curb, for the purposes set forth.

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

FRANCIS A. CLOUDMAN.

Witnesses:

A. A. CORDWELL,
JNO. E. WARREN.