No. 615,967. Patented Dec. 13, 1898.

T. CRANEY.

CONTINUOUS CENTRIFUGAL MACHINE.

(Application filed Nov. 18, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

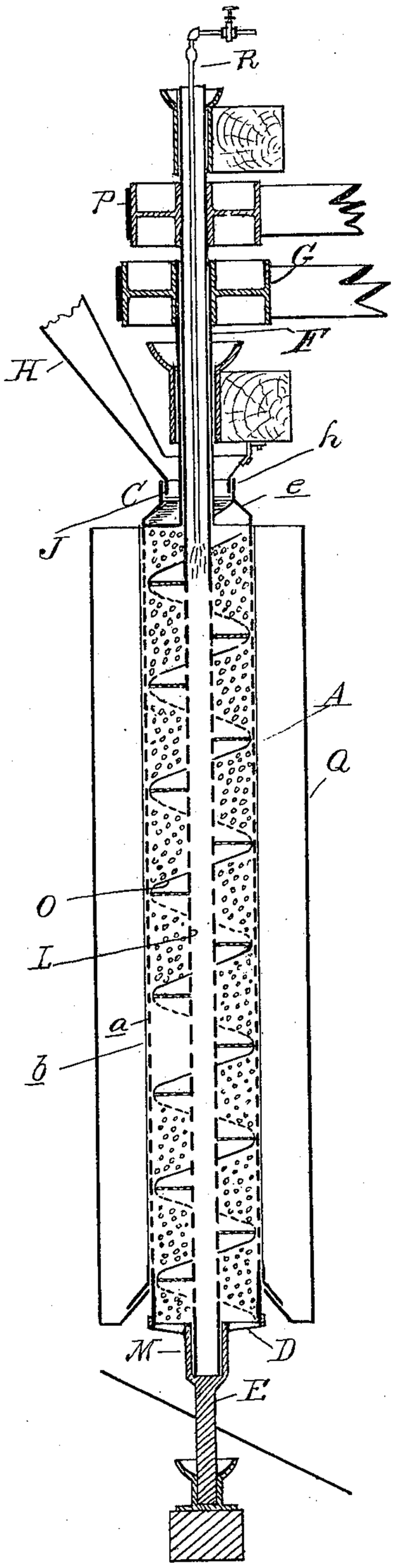

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Fig. 5.

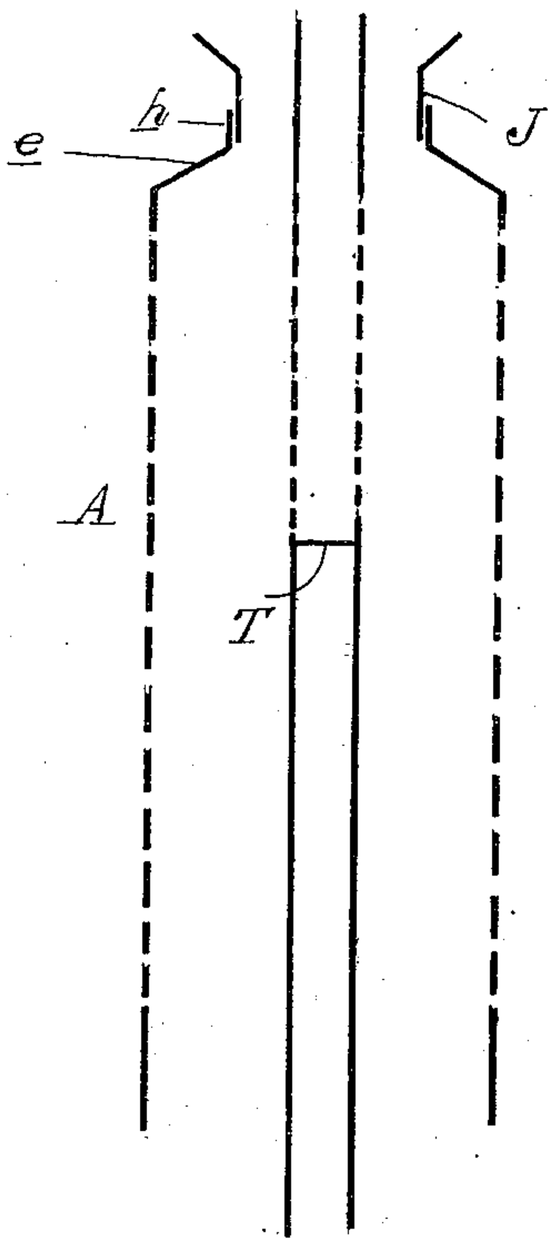


Fig. 2.

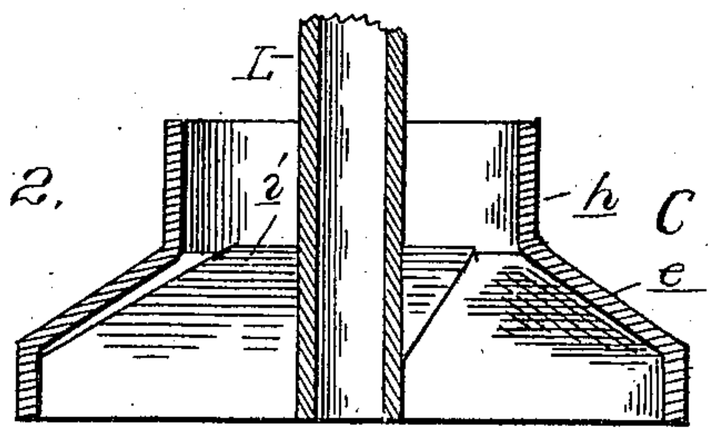


Fig. 3.

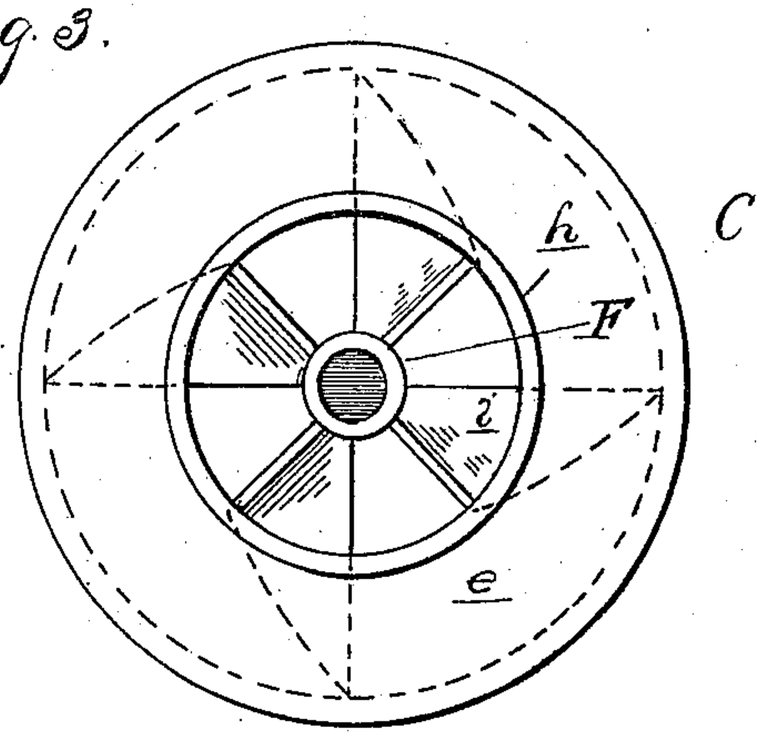
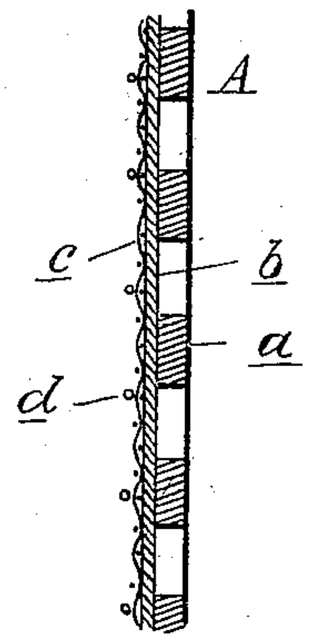


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

CONTINUOUS CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 615,967, dated December 13, 1898.

Application filed November 18, 1897. Serial No. 658,914. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRANEY, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Continuous Centrifugators, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a centrifugal drier especially intended for granular and pulverulent material—such as salt, ores, &c.; and it consists particularly in a device comprising a foraminous shell adapted to be rotated at sufficiently high speed to dry the material and a screw or worm within this shell moving at a slightly different speed, so as to hold the material from endwise movement and to positively feed it at such speed through the shell as to permit it to be thoroughly dried while passing therethrough.

The invention further consists in the construction, combination, and arrangement of various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a vertical central longitudinal section through my improved machine, showing it as arranged in a vertical position. Fig. 2 is an enlarged section of the top of the shell. Fig. 3 is a plan view thereof. Fig. 4 is an enlarged section through a portion of the shell, illustrating the preferable manner of forming the shell. Fig. 5 is a section similar to Fig. 1, showing a slight modification.

A is a foraminous shell, preferably cylindrical and also preferably arranged vertical, although it will operate in any position. This shell I prefer to make as shown in Fig. 4, comprising the foraminous shell *a* of perforated sheet metal. Outside of this is a layer of fibrous material *b*—such, for instance, as felt—and this I bind on by wire-cloth *c* and then tightly bind the covering onto the shell by means, for instance, of an endless wire or band *d*, so as to make a strong structure which will permit the fluid from the material to pass readily therethrough and at the same time will retain the material and be sufficiently strong to prevent accidents when at high speeds.

C and D are heads secured, respectively, to the upper and lower end of the casing A.

From the head D is an extension E in the shape of a central shaft supported in suitable bearings, and from the head C is a tubular shaft F, which is also supported in suitable bearings and is provided with a drive-pulley G.

The head D has openings through which the material may be delivered at the bottom or delivery end of the casing.

The head C is of the construction shown in Figs. 1, 2, and 3, comprising the tapering cap *e*, the collar *h*, and the inclined blades *i* in the cap portion. The material is fed into a hopper H, which has a collar J, fitting in the collar *h* and delivering the material down to the blades *i*, which, as described, are in the enlarged or tapering cap *e*. Passing centrally through the casing and shell and through the shaft F is a tubular shaft L, its lower end being journaled in a bearing M in the head D. On this shaft L is a worm or screw O. The shaft L is provided with a suitable drive-pulley P, preferably of a different size from the pulley G, so as to drive it at a slightly different speed from the shell A and cause the material fed therein at the top to be slowly fed from one end to the other of the shell, while the shell, being rotated at high speed, will centrifugally force out the fluid from the material in a manner plain to be understood from the description already given.

The material being fed at the top is delivered directly to the blades *i*, which catch it up and act as an initial feed-screw for delivering it into the shell, so that the centrifugal effect does not at the top tend to throw it out. These blades also form the drive connection between the shaft F and the casing A.

Surrounding the shell I preferably employ a casing Q, against which the fluid may strike, and provide any suitable means for carrying off the fluid therefrom. (Not shown.)

The dried material may be also carried off at the lower end of the machine in any suitable manner.

The hollow shaft L may be perforated, as shown in Fig. 1, practically its whole length or it may be perforated simply partially or in zones—as, for instance, I have shown in

Fig. 5 simply the upper portion perforated and a diaphragm T closing the lower portion thereof. A fluid-supply pipe R may be allowed to discharge into this hollow shaft, and in the operation of the machine the material passing through this casing may be treated by any suitable fluid or for any suitable purpose—as, for instance, with the construction shown in Fig. 5, if salt is being dried a pure salt solution may be fed into the top of the shaft L, and the salt will first be washed by this solution in the upper part of this centrifugal casing and then be dried as it passes through the remainder. This flushing apparatus may also be used, if desired, to clean the foraminous casing or shell.

What I claim as my invention is—

1. In a centrifugal drier, the combination of a vertical rotary foraminous casing, a cap C at the upper end thereof having the open collar *h* and substantially conical portion *e*, a central shaft, blades connecting the cap and shaft, the said blades being inclined relative to the line of movement of the blades whereby they positively feed the material downward, and a feed-hopper having an end J within the collar *h* and adapted to feed the material to the casing.

2. In a centrifugal drier, the combination of a rotary foraminous casing, end caps therefor, one end cap having a shaft extending outwardly therefrom and having a bearing in the inner end thereof, a tubular shaft secured to and extending outwardly from the other cap, a shaft passing through said tubular shaft and extending beyond the same at both ends and having the end within the casing supported by the bearing in said first-mentioned shaft, a worm secured to said last-mentioned shaft within the casing and a pulley secured to the hollow shaft and to the shaft passing therethrough at the same end of the casing.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS CRANEY.

Witnesses:
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M. B. O'DOGHERTY.