(No Model.) 2 Sheets—Sheet 1.

E. E. QUIMBY.

CENTRIFUGAL SEPARATOR.

No. 260,412. Patented July 4, 1882.

Fig. 2.

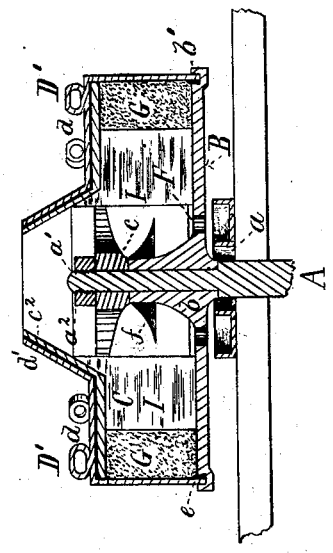


Fig. 5.

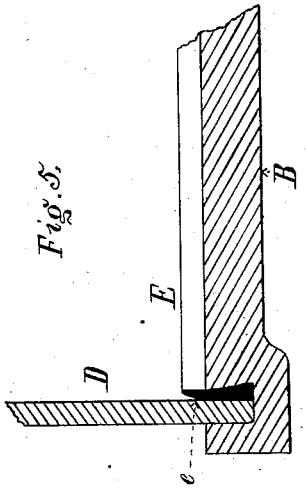


Fig. 3.

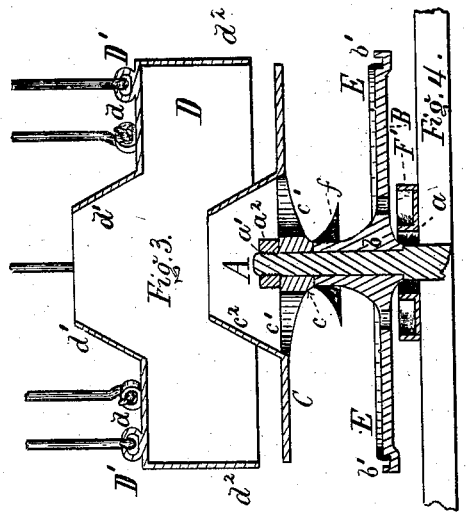
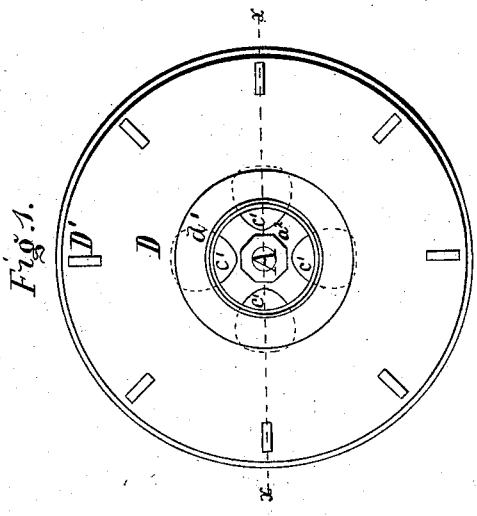


Fig. 4.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2

E. E. QUIMBY.

CENTRIFUGAL SEPARATOR.

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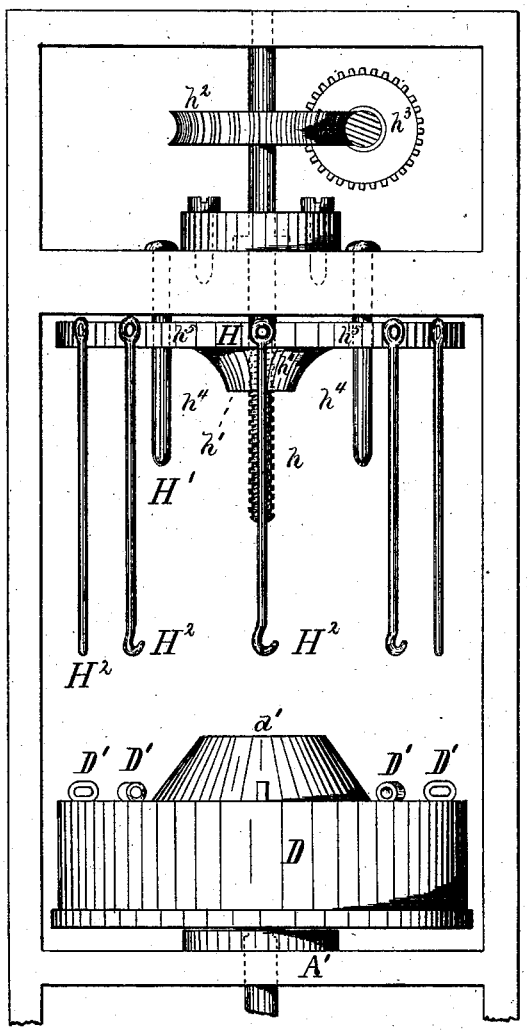
Fig. 6.



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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 260,412, dated July 4, 1882.

Application filed May 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. QUIMBY, of Orange, New Jersey, have invented certain Improvements in Centrifugal Separators, of which the following is a specification.

The use of centrifugal machines to effect the separation of starch from the liquid matter with which it is mixed in the earlier steps of the process of manufacturing starch has long been known.

It is the object of my improvements to facilitate the removal of the starch from the centrifugal machine; and I effect this object by making the rim of the centrifugal-machine drum removable from the bottom of the drum, and by affixing to the spindle of the machine at a suitable distance above the bottom a stripping-disk, which is closely contained within the movable rim, and hence serves to hold down a wall of starch formed against the inside of the rim while the rim is being lifted. The starch being thus stripped from the rim forms an annular wall resting upon the outer portion of the bottom of the drum, and can then be easily removed therefrom.

The accompanying drawings, representing my invention, are as follows:

Figure 1 is a top view of a centrifugal machine provided with my removable rim. Fig. 2 is a central vertical section of the same through the line *x x* on Fig. 1. Fig. 3 is a similar section of the removable shell of the machine. Fig. 4 is a similar section, showing the bottom of the drum and the stripping-disk. Fig. 5 is a transverse section of a portion of the bottom of the drum and rim, and the elastic packing-strip for making a tight joint between the rim and bottom. Fig. 6 is an elevation of the machine, showing the mechanism for elevating the rim.

The drawings represent a centrifugal machine mounted upon a vertical shaft, A, the upper portion only of which is shown, the lower portion being constructed in the ordinary manner, provided with suitable bearings, and with a pulley by which the machine is driven.

The shaft A is provided with the shoulder *a* for the support of the centrally-perforated disk B, which constitutes the bottom of the drum. The bottom disk, B, is provided with the stout hub *b*, the upper end of which supports the lower end of hub *c* of the stripping-disk C. The shaft A extends through the hubs *b* and *c*, and the upper part of it is provided with the screw-thread *a'* for receiving the nut a^2.

The disks are keyed to the shaft A in the usual manner.

The stripping-disk C is provided near the middle with the perforations *c'*, and with the upwardly-projecting conical mouth c^2.

The periphery or rim D of the drum is provided at the top with the inwardly-turned flange *d*, the edge of which is united to the base of the conical mouth *d'*.

The stripping-disk C is slightly less in diameter than the interior of the rim D, against which it fits loosely.

The bottom disk, B, is provided near its edge with the annular groove *b'* to receive the lower edge, d^2, of the rim D. The inner wall of the groove *b'* is upwardly and outwardly inclined, and is provided with the annular packing-strip E, of elastic material, the upper portion, *e*, of which is slightly chamfered, and projects a short distance above the upper surface of the disk B. The lower portion of the strip E is thickened and the strip is sprung into its seat; or the strip E may be permanently secured in place in any other convenient way. When the machine is set in motion the projecting upper portion of the elastic strip E is pressed outward by centrifugal action against the interior surface of the rim D and makes a tight joint therewith.

The bottom disk, B, is provided near the middle with the holes F. Liquid discharged from the interior of the drum through the holes F falls into the annular drip-trough F', from which it is conducted by a suitable conduit to any convenient receptacle. An annular shield, *f*, affixed to the hub *b*, projects radially therefrom, and catches fluid poured into the drum through the mouth c^2 and prevents it from falling directly into the holes F.

The removable rim D is provided at the top with the eyebolts or handles D', by means of which the rim can be taken hold of and lifted.

In operation the starch is thrown outward and forms a wall, G, against the interior of the rim D, to the surface of which the starch adheres with such tenacity that some force is

required to lift the rim D and strip it from the surface of the starch-wall G. To effect this object I employ the elevator-disk H, provided with the dependent links H′, having the hooks H^2 upon their lower ends for hooking into the eyes D′ on the top of the rim.

The disk is elevated and lowered by means of the stationary elevator-screw *h*, which is inserted through the central perforation, *h′*, in the elevator-disk H, and engages a female screw-thread formed therein. The upper end of the elevator-screw *h* is provided with a worm-wheel, h^2, engaging a worm, h^3, to which the necessary power is applied to operate the screw. When the rim D is lowered into its seat and the machine is in operation the elevator-disk H and the links dependent therefrom are lifted up out of the way.

In operation the rim D is dropped into its seat in the groove *b′*, and the machine being then set in motion, the starch mixture or other material to be acted upon is poured into the drum through the mouth c^2 of the stripping-disk. Centrifugal action causes the mixture to press radially outward, and the heavier solid matter which it contains collects against the interior surface of the rim D and forms an annular coating thereon of greater or less thickness, according to the length of time the machine is operated and the quantity of material introduced into the drum. During the feeding operation, as the mixture is fed into the drum the shield *f* directs it radially outward and prevents it from falling upon the perforated parts of the disk B.

In conducting the feeding operation, sufficient time is given for the complete separation of the starch from the mixture which is first introduced, and thereafter the mixture is introduced gradually, so that nothing but liquid from which the starch has been separated is allowed to escape through the holes F.

The lighter constituents of the mixture form the inner portion of the annular wall of fluid, I, and the holes F are intended for the outlet of fluid escaping by gravity from the inner portion of the annular wall I, and also for the discharge of fluid from the drum when the machine is stopped.

The elevator-disk H is prevented from turning by means of the steady-pins h^4, affixed to the horizontal frame of the machine, and projecting downward therefrom through suitable holes, h^5, in the elevator-disk.

It will of course be understood that my apparatus may be employed to separate the constituents of any mixture containing materials of different specific gravities, and that unless the heavier or solid material adheres tenaciously to the rim the stripping-disk will not be required and may be dispensed with, in which case the mixture will be filled into the drum through the mouth *d′* of the rim.

I claim as my invention—

1. In a centrifugal machine, the removable rim D, in combination with the rotating bottom disk, B, as and for the purpose set forth.

2. The removable rim D, in combination with the rotating bottom disk, B, and the stripping-disk C, substantially as and for the purpose set forth.

3. The rim D and the rotating bottom disk, B, provided with the holes F, in combination with the shield *f*, as and for the purpose set forth.

4. The rim D, provided with the handles D′ and means for elevating the rim, as and for the purpose set forth.

EDW. E. QUIMBY.

Witnesses:
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