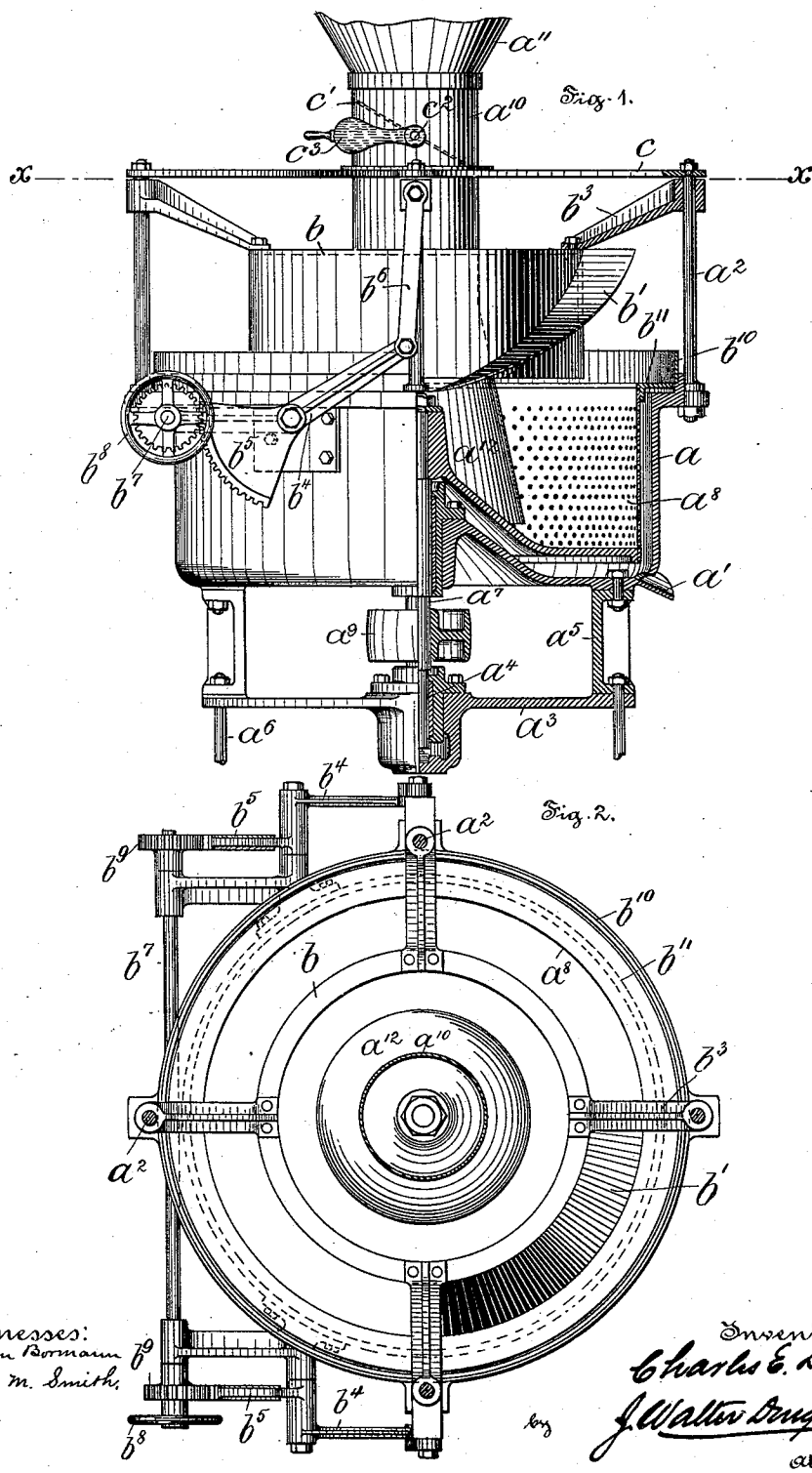


(No Model.)

C. E. DULIN.
CENTRIFUGAL MACHINE.

No. 466,459.

Patented Jan. 5, 1892.



Witnesses:
Hermann Bornmann
Thomas M. Smith,

Inventor:
Charles E. Dulin,
J. Walter Douglass,
att'y.

UNITED STATES PATENT OFFICE.

CHARLES EDWIN DULIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO ALFRED N. HARRIS, OF SAME PLACE.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 466,459, dated January 5, 1892.

Application filed April 8, 1891. Serial No. 388,103. (No model.)

To all whom it may concern:

Be it known that I, CHARLES EDWIN DULIN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Centrifugal Machines, of which the following is a specification.

It is well understood that during the ordinary operation of a centrifugal machine the liquid portion of the material being operated upon by the machine is automatically separated and discharged from the basket or sieve, whereas the solid portion is retained in the same and has to be removed therefrom by means of suitable devices or apparatus.

My present invention relates in general to apparatus for removing the solid material from the sieve or basket, and more particularly to the construction and arrangement of the parts thereof.

The principal object of present invention is to provide a centrifugal machine with simple, durable, and efficient apparatus for expeditiously removing the solid portions of the material being operated upon without injuring the interior of the sieve or basket and with simple and inexpensive means for raising said apparatus out of the sieve or basket during the operation of separating the liquid and for lowering the same into the basket to remove the solid material without stopping the revolution of the basket.

In my invention use is made of a non-rotating and axially-movable cylinder provided with a radially-projecting spiral flange or scraper and adapted to be placed in and lifted out of the interior of a rotating basket or sieve, in connection with mechanism attached to the outer case or frame of the machine and adapted to lift and hold the cylinder out of the basket or sieve during the separation of the liquid and to place and hold the same in the basket or sieve after the separation of the liquid, in order to cause the scraper or flange to scrape the solid matter from and lift it upward out of the sieve or basket and deposit it upon a suitable table.

The nature and characteristic features of the present invention will be more fully understood from the following description, taken

in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is an elevation, partly in section, of a centrifugal machine provided with the improvements embodying my invention and showing a non-rotating cylinder having a radially-disposed spiral scraper or flange and means for shifting the cylinder axially into or out of the basket or sieve of the machine; and Fig. 2 is a horizontal section on the line xx of Fig. 1, showing mechanism for raising and lowering the non-rotating cylinder.

Before proceeding to describe my invention a brief description of a well-known type of centrifugal machine will be given; but it must be borne in mind that my invention is not limited to the employment of such a type of machine, because it is applicable to other types of machines.

In the drawings, a is an outer casing or curb, provided with an offtake a' and with rods or stays a^2 , adapted to support a frame c for a purpose to be presently described.

a^3 is a plate provided with a journal or bearing a^4 , connected with the casing or curb a by means of pillars a^5 .

a^6 are rods attached to the plate a^3 and to the floor or to a bed-plate (not shown) in order to retain the machine to place.

a^7 is a shaft supported in the step or bearing a^4 and provided with a sieve or basket a^8 .

a^9 is a pulley keyed or otherwise attached to the shaft a^7 and adapted to be revolved by means of a belt. (Not shown.)

a^{10} is a spout provided with an improved form of valve hereinafter described, and with expanded or flaring mouths a^{11} and a^{12} for receiving and conveying the material to be operated upon into and deposit the same on the bottom of the basket or sieve a^8 .

In use the sieve or basket a^8 is revolved rapidly and the material to be operated upon or dried—for example, sugar or brewer's grain—is introduced either in the manner hereinafter described or in any convenient manner into the basket or sieve a^8 . The centrifugal force generated by the rapid revolution of the sieve or basket a^8 causes the liquid associated with the grain or the sirup or molasses of the sugar to penetrate the perforated walls of the basket or carrier and enter the

outer casing or curb a , from which it may be drawn off by means of the offtake a' . The grain or sugar of course is retained in the basket or sieve.

5 My invention comprises apparatus for removing the matter which accumulates in the basket or sieve during the operation of the machine; and having thus indicated the parts and mode of operation of one type of machine
10 to which my invention is applicable I will now proceed to describe the construction and mode of operation of an apparatus embodying the invention.

15 In the drawings, c' is a valve pivotally attached to the interior walls of the spout a^{10} by means of trunnions c^2 and adapted to normally occupy a position at an angle of forty-five degrees (more or less) with the axis of the spout.

20 c^3 is a weighted lever attached to one of the trunnions c^2 and adapted to normally close the valve c' , so as to enable the upper portion of the spout a^{10} to be used as a receptacle for a charge, which latter may be introduced into
25 the basket or sieve whenever it becomes desirable or necessary so to do by the simple operation of elevating the lever c^3 by hand or in any other convenient manner.

30 b is a cylinder arranged around the spout a^{10} and provided with a radially-disposed spiral flange or scraper b' , adapted to fit snugly against the interior of the side wall of the basket or sieve a^8 .

35 b^3 are arms or guides attached to the periphery of the cylinder b and provided with eyes adapted to engage with and slide on the rods a^2 , so as to afford the cylinder a range of axial movement and so as to prevent the same from being revolved.

40 b^4 are levers pivotally attached at or near the respective centers thereof to the exterior of the casing or curb a and provided, respectively, at one extremity thereof with a toothed sector b^5 and pivotally connected at the other
45 extremities thereof with the cylinder b by means of links b^6 , pivoted, respectively, to the arms b^3 .

50 b^7 is a shaft provided with a hand-wheel b^8 and with gear-wheels b^9 , meshing with the sectors b^5 , so that the cylinder b may be lowered into the revolving sieve or basket a^8 in such manner that the scraper b' contacts with the perforated side wall and bottom thereof or
55 may be lifted therefrom by the simple operation of rotating the hand-wheel b^8 .

The material to be operated upon—for example, grain or sugar—is placed in the upper open extremity a^{11} of the spout a^{10} , and is detained therein by the valve c' until a sufficient quantity thereof for charging the basket
60 or sieve a^8 has been accumulated, whereupon the handle c^3 is lifted and the charge permitted to descend into the revolving basket or sieve, and then treated in the usual manner.

65 After the liquid has been separated from the solid material by means of the rotating basket or sieve a^8 and in the ordinary operation of

the machine the lever c^3 is permitted to close the valve c' , or the introduction of material through the spout a^{10} is otherwise stopped,
70 and the cylinder b is lowered into the rotating basket or sieve a^8 , so that the scraper or flange b' scrapes the solid material from the interior of the sieve or basket and delivers it in an upward direction from the same. Of
75 course the scraper or flange may be arranged to deliver the solid material upon any preferred form of carrier adapted to convey it away from the machine. In the present instance the solid material is permitted to leave
80 the flange or scraper radially and in such manner that it is deposited upon a rotating table b^{11} , attached to or formed integral with the basket or sieve a^8 .

85 b^{10} is a stationary flange supported by the curb or casing of the machine and arranged around the rotating table b^{11} in order to prevent the solid matter from accidentally passing over the periphery thereof. In practice the solid material may be removed from the
90 rotating table b^{11} by means of a scoop or in any other preferred manner. After the solid matter has been removed from the sieve or basket the cylinder b is again lifted out of the same and a fresh charge of grain or other material
95 is introduced in the basket or sieve a^8 .

It will be obvious to those skilled in the art to which my invention appertains that modifications may be made in the details thereof. For example, the valve c' may be dispensed
100 with and the successive charges introduced into the basket or sieve a^8 in any other preferred manner.

Having thus described the nature and objects of my present invention, what I claim
105 as new, and desire to secure by Letters Patent, is—

1. In a centrifugal machine, the combination of a rotating sieve or basket, an adjustable spiral flange or scraper to remove the
110 contents of the basket or sieve upward and outward, and means for adjusting said flange or scraper out of range of said basket or sieve to permit of the ordinary operation of the machine and for shifting it into range of the
115 same to permit said scraper or flange to automatically remove in an upward direction the contents, substantially as and for the purposes set forth.

2. In a centrifugal machine, the combination of a rotating sieve or basket, a non-rotating axially-movable cylinder, a radially-projecting spiral flange or scraper attached to
120 said cylinder, and means for lifting said cylinder out of range of said basket or sieve to permit of the ordinary operation of the machine and for lowering it into the same to permit said scraper or flange to remove the
125 contents thereof upward and outward, substantially as and for the purposes set forth.

3. In a centrifugal machine, the combination of a rotating sieve or basket, a rotating table arranged around the top of said basket
130 or sieve, a spiral flange or scraper to remove

the contents of the basket upward and outward onto said table, and means for shifting said flange or scraper with reference to said basket or sieve, substantially as and for the purposes set forth.

4. In a centrifugal machine, the combination of a rotating sieve or basket, a rotating table arranged around the top of said basket or sieve, a flanged guard around said table, a spiral flange or scraper adapted to remove the contents of the sieve or basket upward and outward onto said table, and means for adjusting said flange or scraper with reference to said sieve or basket, substantially as and for the purposes set forth.

5. In a centrifugal machine, the combination of a rotating sieve or basket, a non-ro-

tating cylinder, arms attached to said cylinder and working on fixed rods, a radially-projecting spiral flange or scraper attached to said cylinder, levers pivotally supported at or near their centers and provided with toothed sectors, links attached to said levers and arms, a shaft provided with a hand-wheel, and gears attached to said shaft and engaging said sectors, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

CHARLES EDWIN DULIN.

Witnesses:

THOMAS M. SMITH,
RICHARD C. MAXWELL.