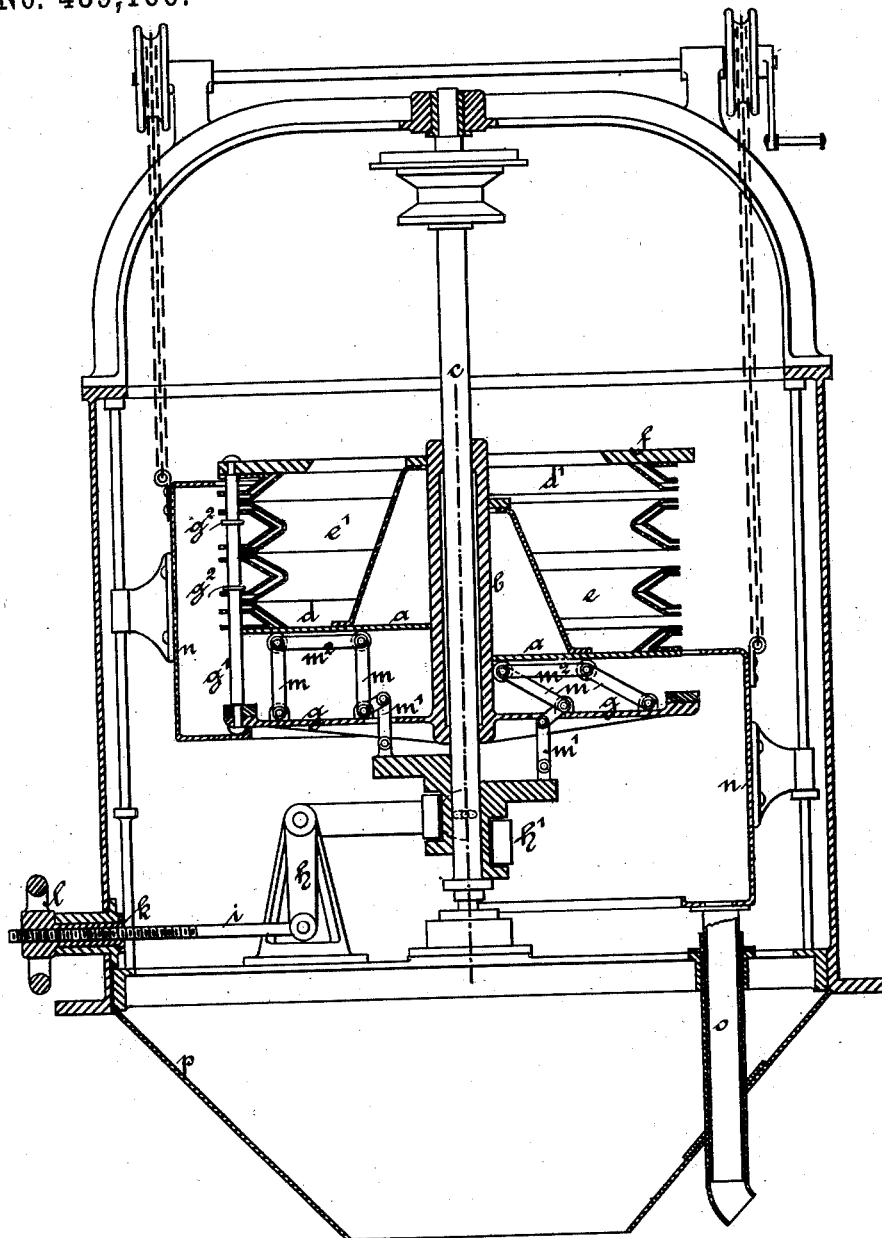


(No Model.)

G. PROEBER.
CENTRIFUGAL MACHINE.

No. 489,166.

Patented Jan. 3, 1893.



Witnesses:-
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UNITED STATES PATENT OFFICE.

GUSTAV PROEBER, OF BRUNSWICK, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO GUSTAV OLBERG, OF GREVENBROICH, GERMANY.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 489,166, dated January 3, 1893.

Application filed December 31, 1891. Serial No. 416,660. (No model.) Patented in Germany March 31, 1889, No. 51,514.

To all whom it may concern:

Be it known that I, GUSTAV PROEBER, formerly of Dermbach, but now of Brunswick, in the German Empire, have invented certain
5 new and useful improvements in centrifugal machines or hydro-extractors for extracting sugar-juice from crystals, and for other purposes, of which the following is a specification, and for which I have obtained German Patent
10 No. 51,514, dated March 31, 1889.

The invention consists in the construction of centrifugal machines for separating solid substances from fluids or semi-fluids, the particular feature of these machines according
15 to the present invention being that they may be automatically and instantaneously emptied while revolving, maintaining their regular and continued rotary motion, thereby increasing their working capability in a very
20 simple and inexpensive manner.

In most centrifugal machines hitherto known, in which for separating purposes the fluid is pressed through the perforated or sieve-like walls of the drum by centrifugal force,
25 the removal of the separated solid substances retained is effectuated in another direction, *i. e.* either through openings provided in the bottom of the drum or by the upper opening of the drum. By the new process and construction of the machine the removal of such
30 solid substances from the drum is effectuated automatically through channels or openings or apertures provided in the circumference of the drum. The new construction of the
35 drum consists mainly in composing the circumferential wall of such drum of a number of parts, the latter being arranged either vertically or horizontally and being capable of constituting the closed drum for the working
40 operation, while such parts at the same time are arranged and connected with suitable mechanism for being able to be removed, shifted or separated from each other so as to
45 exit of the solid substance or mass from the drum through the action of the centrifugal force. The parts, constituting the circumference of the drum may either have slanting, oblique or curved surfaces toward the center
50 of the drum, thereby the draining surface being materially increased for the quicker or

speedier removal of the fluid during the working operation.

It will be well to state that there have been constructed centrifugal machines for the reception and working of the semi-fluids and
55 for the automatical removal of the solid substance, but in these known machines the advance or progress or travel of the solid substances through the drum has been subject to
60 regulation according to the nature of such substances, and the means for regulating such perpetual advance, progress, travel or passage of the solid substance through the drum had to be adjusted individually, according to the
65 nature of such substances. Such regulation has met with serious difficulties and it is a main feature of the present invention that means have been applied, which allow after
70 ascertaining by one or two trial operations the time necessary for each operation to determine, watch in hand, by simply handling a lever or wheel, the duration of the centrifugal operation as regards filling, centrifuging
75 and emptying and so on, thereby in all the consecutive operations arriving at a uniform product, as far as the dry product or solid substance separated from the fluid is concerned.

The drawing represents a vertical section of a machine embodying my invention. 80

The drum may be composed of movable horizontal rings built up one over the other having angle-shaped or inclined surfaces toward the interior of the drum as indicated in the accompanying drawing. A strong disk or
85 plate *g*, rigidly connected to the vertical central shaft forms the lower support of the drum, said disk carrying near its periphery several upright bolts or rods *g'*, the upper ends of which are supported or kept steady by a ring-shaped disk *f*. Said bolts serve as guides for the rings *d d'*, *e e'*, capable of being moved in an upward or downward direction. The lower
90 ring *d* consisting of one incline at its inner side only, is rigidly connected to a plate *a* forming the bottom of the drum. This plate *a* is connected to the above mentioned plate *g* (fixed to the shaft) by means of hinges and levers *m m'* in such a manner that by actuating the lever mechanism, the lower ring *d* and the
100 rings *e e'* resting on the same may be moved in an up and downward direction. If the

bottom plate *a* is pressed in upward direction, the single rings will be all in close proximity and the upper ring *e'* will press against the uppermost ring *d'*, which is fixed to the plate *f* carried by the bolts *g'* so that a drum with a closed circumference is formed. If, however, the bottom plate *a* is lowered, there will be created play room or apertures between the single rings. Said rings in this instance are carried by collars *g²* on bolts *g'*. The material under treatment, by the action of the centrifugal force will escape through said apertures. The levers *m* are fixed movably on the ground plate *g* and they support with the other ends which are provided with antifric-tion rollers, the bottom plate *a* of the drum. The said levers receive their mutual and parallel movement by a sleeve *h'* which is connected to the lever *m* by means of levers *m'* with links, the levers *m''* being connected together by rods *m²*. Said sleeve *h'* is mounted on the vertical central shaft connected to the latter by groove and key, so that the sleeve will rotate with the shaft, but may be shifted vertically on the shaft up or down. Into the circumferential groove of said sleeve the forked end of lever *h* may take, said lever being pivoted on a suitable part of the framing of the machine and by moving said lever in the one or the other direction, the sleeve may be raised or lowered at will during rotation of the shaft. This lever *h* is operated by means of a rod *i* connected to its lower end. This rod *i* has a threaded end within a fixed nut *k* which is revolved by a hand-wheel *l*.

The rings *d e d' e'* forming the drum may be perforated and may be covered with wire gauze at the inside as usual for allowing the liquid to escape under the centrifugal action, or they may be provided on the inclined surfaces with gutters covered by wire gauze, said gutters forming channels for the fluid to escape. These channels terminate where the rings meet. It will be found preferable to unite or fix the wire gauze to its supporting surface by means of soldering.

The drum may be surrounded by a mantle *n* suspended in chains with proper gear for lowering and raising said mantle. The mantle is suspended in the position indicated on the left half of the drawing to serve as a catch for the fluid driven out by the centrifugal force and conducting away said fluid through the pipe *o* which is arranged to slide according to the lowering or raising of the mantle. If said mantle is lowered and the openings in the circumference of the drum are created by the means above indicated, the solid substance will be thrown against the outer casing of the machine dropping into the hopper

p and thus escaping into a receptacle or wherever it is desired to lead the substance to. This arrangement may be reversed so that the movable mantle is brought into position for forming a wall against which the solid substance is thrown during evacuation while the said mantle is in a raised or lowered position during centrifugal action or process, the outer casing serving in such case for the catch of the fluid.

The operation with the machine is a very simple one and will easily be understood by the foregoing specification.

It is to be noted that the essential advantage of the machine not only consists therein that by its continuous revolving much time and power are gained, but also that by the use of inclined parts protruding toward the inner space of the drum, the draining surface of such drums is essentially increased in view of the old drums of equal diameter.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a centrifugal machine, a rotary central shaft, horizontal rings concentrically surrounding the shaft and movable toward and away from each other to form the sides of a closed or open drum, a plate *a* forming the bottom of said drum and having a sliding movement on the shaft, a bed plate *g* rigidly affixed to the shaft, levers carried by said bed plate and engaging the said plate *a*, a movable boss sliding on said shaft and connected to the levers for raising and lowering the plate *a* and thereby the horizontal rings, and means for shifting the movable boss up and down on the shaft, substantially as and for the purpose hereinbefore set forth.

2. The combination in a centrifugal machine of a rotary central shaft, a hub thereon, horizontal rings *e, e'* surrounding the said shaft and hub, a bed plate *g* rigidly affixed to the lower end of the said hub, an annular disk *f*, rods *g'* affixed to the said plate *g* and disk *f* to guide the rings *e, e'*, and having collars *g², g²* for the support of said rings *e, e'*, a bottom plate *a* capable of sliding on the said hub and levers *m', m, m²* between said plates *g* and *a* for the purpose of controlling the said plate *a* and rings *e, e'* to open and close annular spaces formed between them and the said disk *f*, substantially as and for the purpose hereinbefore set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GUSTAV PROEBER.

Witnesses:

WILHELM WIESENHUEBER,
GEORGE RICHTER.