No. 630,736. Patented Aug. 8, 1899.

T. L. PATTERSON.

CENTRIFUGAL MACHINE.

(Application filed Apr. 12, 1898.)

(No Model.)

FIG. 1.

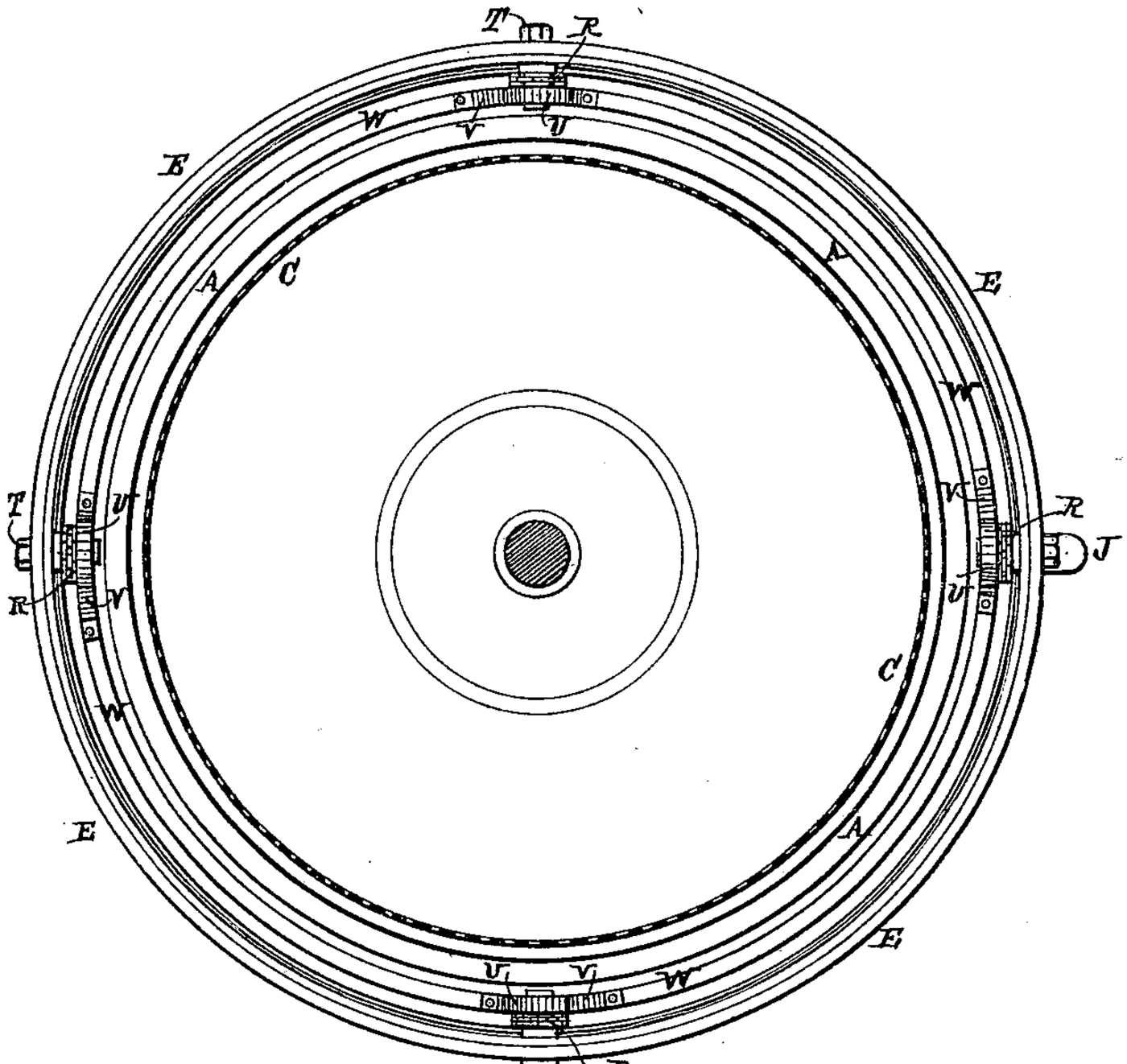


FIG. 2.

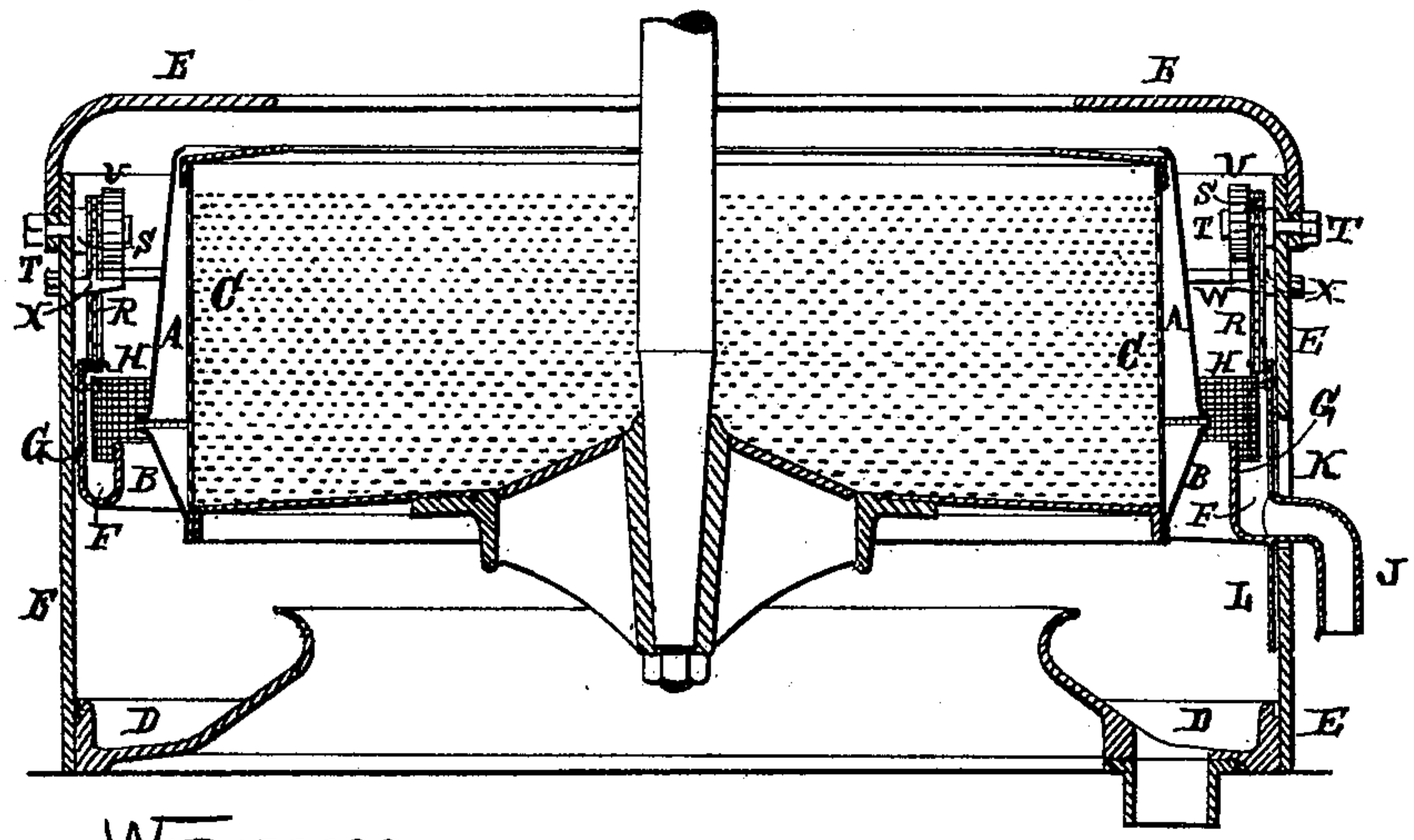
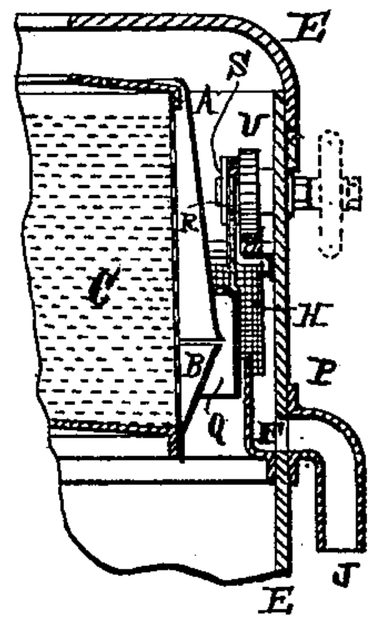


FIG. 3.



WITNESSES:
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UNITED STATES PATENT OFFICE.

THOMAS LAW PATTERSON, OF GREENOCK, SCOTLAND.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,736, dated August 8, 1899.

Application filed April 12, 1898. Serial No. 677,326. (No model.)

To all whom it may concern:

Be it known that I, THOMAS LAW PATTERSON, a subject of the Queen of Great Britain and Ireland, and a resident of Greenock, in the county of Renfrew, Scotland, have invented certain Improvements in Centrifugal Machines, (for which I have applied for a British patent, application No. 22,384, dated September 30, 1897,) of which the following is a specification.

This invention comprises certain improvements in centrifugal machines for use in sugar factories and refineries and in various processes in the chemical arts which make it possible to separate and classify the drainage into two or more portions, according to its purity—as, for instance, in the sugar industry the impure molasses or syrups can be separated from the comparatively pure washings or steamings. When the latter are returned to the pan and boiled into the same quality of masse-cuite as that from which they were separated, the highest yield of sugar will be obtained at the expense of the next lowest quality.

My improvements, which are applicable to underdriven or overdriven centrifugals, are shown on an accompanying sheet of explanatory drawings, Figure 1 being a plan with the top of the outer casing removed, and Fig. 2 a vertical section. Fig. 3 is a partial vertical section showing a slight modification of details.

The improvements consist in fitting two slightly conical shields or covers A B of sheet metal around the outside of the basket C in such a manner that the bases of the two cones very nearly meet between the center and bottom of the basket C, forming an annular opening through which the drainage escaping from the perforated basket-shell C is discharged. At this opening the edges of the cones A B may be flanged outward to a small extent or turned over a wire to form a kind of lip. The upper cone A is flanged or curved inward at the top of the basket C in order to catch any drainage or spill from overcharging, and it is fastened to the basket C by bolts or rivets (not shown) at the top and bottom, a small annular opening all around being left at the top to allow the drainage or spill to pass to the discharge-outlet between the cones.

Instead of separate cones A B a sheet of metal may be rolled in such a manner that when the two ends are brought together riveted, and fastened to the basket C it forms a double conical cover projecting from the side about two inches all around at the widest part. To allow the drainage to escape, when the cover is in one piece it is perforated with holes all around the widest part at the angle corresponding to the annular opening between the separate cones A B. The cover will then act in the same way as the cones.

Besides the ordinary gutter D at the bottom of the casing E a movable gutter F of sheet metal two or three inches wide and about three inches deep at one side, gradually increasing in depth circumferentially both ways to five or six inches at the opposite side, is made to fit loosely inside the outer casing E. The back or outer side G of the gutter F rises three inches higher than the front and a strip of stout copper-wire cloth H is riveted on in front, with the lower edge dipping into the gutter F to prevent the drainage discharged against it splashing back. A pipe J, connected with the bottom of the gutter F at the deepest part, is bent outward through a slot K in the outer casing E to carry the drainage caught in the gutter F to one or more suitable receptacles, (not shown,) and when the gutter F is raised, as hereinafter described, the slotted opening K is covered by a sheet-metal plate L, attached to the gutter F in such a manner that the opening K is always closed whether the gutter F is up or down.

Instead of a movable gutter a fixed gutter and movable guard or shield may be used. In this case the fixed gutter F, similar in construction to the movable one, is bolted on the inside of the outer casing E at a convenient height above the ordinary gutter D in the bottom, or the fixed gutter F may be fixed to the casing so as to be partly inside and partly outside.

The movable circular guard or shield Q of sheet metal is flanged slightly inward at the top and is made to fit loosely inside of the fixed gutter F, between it and the basket-cov-

ers A B. The movable gutter F, Fig. 2, or the movable guard Q, Fig. 3, as the case may be, is suspended by chains R from pulleys S, turning on spindles T, bolted to the casing E of the centrifugal. A small spur-wheel U, attached to or in one piece with each pulley S, is geared with a rack V underneath, bolted to a metal ring W, passing around the inside of the casing E. The ring W rests on brackets X, with pins to keep it in position. A hand-wheel Y is fixed on the outer end of one of the spindles T, which is fitted to turn in bearings, and when the hand-wheel, which can be clamped in position, is turned motion is communicated to all the wheels U and pulleys S inside the casing E through the metal ring W, and the movable gutter F or guard Q is raised or lowered by the chains R. Instead of fixing the hand-wheel Y on one of the spindles T another spur-wheel may be provided, which is keyed on a similar spindle passing through the casing and having a hand-wheel at its outer end. This spur-wheel will gear with another similar rack attached to the metal ring, which will be supported at this point by another bracket.

When there is insufficient room between the basket C and outer casing E in old machines to allow for fixing the apparatus above specified or when room must be left for the oscillation of the basket, the outer casing will require to be made larger in diameter; but in many centrifugals at present in use, especially in those with fixed spindles, there is sufficient room, as not more than one inch, say, of clearance is necessary between the gutter or guard and the conical covers.

In operating with the movable gutter F, which is shown in its lowest position in Fig. 2, the gutter is raised into the upper part of the casing by the hand-wheel Y, as hereinbefore described. In this position the gutter F cannot be soiled by impure drainage getting access to it, since the inner wall of the gutter forms a guard whose top is higher than the annular opening or perforations between the cones A B, forming the cover of the basket C. The machine is now charged and started in the usual way and the syrup or molasses, supposing it to be masse-cuite that is under treatment, passing through the perforations of the basket C is caught on the conical covers and discharged through the annular opening or perforations, flowing away by the bottom gutter D in the ordinary manner. The sugar in the machine may now be washed with saturated solution of pure sugar or clairce, water, or steam. When the impure syrup or molasses is discharged, the movable gutter F is lowered into the position shown in Fig. 2 by means of the hand-wheel Y and the washings, which are very pure compared with the syrup or molasses, are caught against the wire-cloth H and conducted outside the casing E by the movable gutter F and pipe J, from which they may be conveyed by suitably-arranged gutters (not shown) to as many receptacles as desired, so as to divide the washings for after treatment.

In operating with the movable guard or shield Q and fixed gutter F, as shown in Fig. 3, the manipulation is similar to that with the movable gutter F, except in this, that the guard intercepts the drainage when raised to its highest position, from which it drops into the ordinary gutter D at the bottom of the casing E and allows the washings to pass over the top against the wire-cloth H into the fixed gutter F when the guard Q is lowered below the lip of the latter. The guard Q can be made to lift above the fixed gutter and allow the washings to pass beneath it; but I prefer the first method.

What I claim as my invention is—

1. In centrifugal machines a basket provided with a shield having its widest part between the center and bottom of the basket, at which part said shield is made with an annular opening, in combination with the ordinary bottom gutter and with an additional upper gutter, a movable guard for directing the drainage into one gutter or the other, and operating devices therefor, comprising chains and pulleys having pinions movable simultaneously by a ring having toothed racks gearing with the pinions.

2. In centrifugal machines, a basket provided with a shield having its widest part between the center and bottom of the basket, said shield being made with an annular opening, in combination with the ordinary bottom gutter and with an additional upper gutter, a strip of wire-cloth to prevent splashing of the drainage, and a guard for directing the drainage into one gutter or the other, all substantially as described.

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

THOMAS LAW PATTERSON.

Witnesses:
JAMES FRAME,
ROBERT JACKSON.