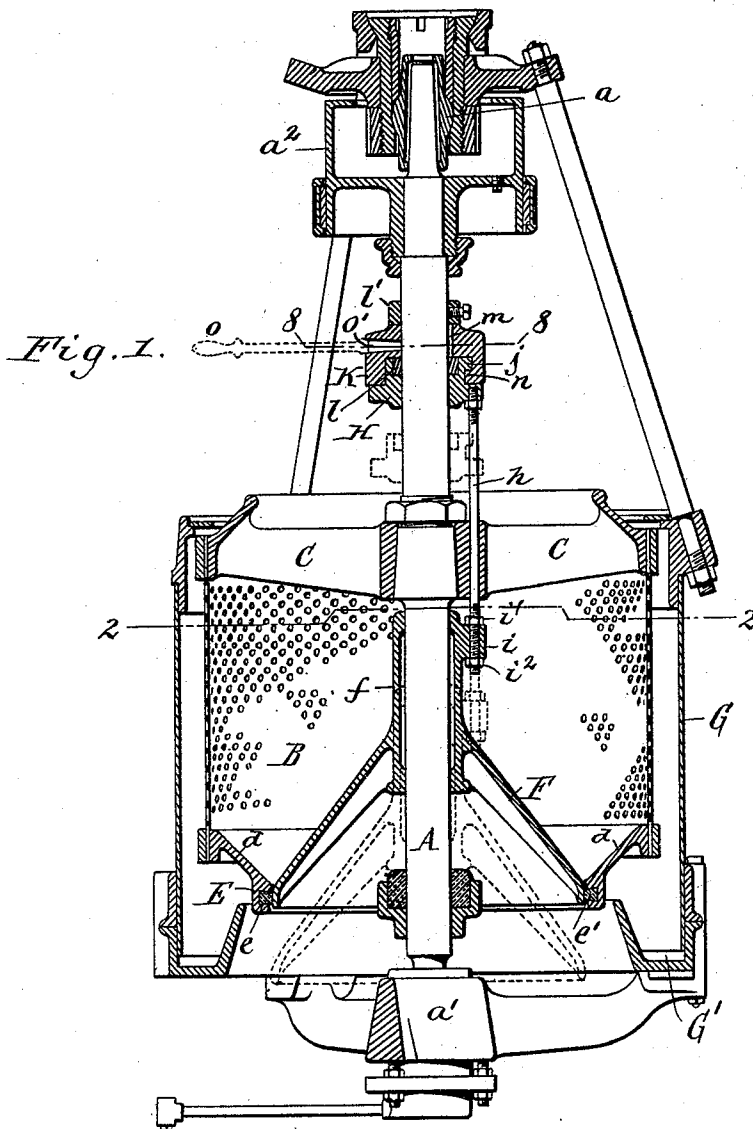


J. M. DUNCAN.
CENTRIFUGAL SALT DRIER.

No. 498,383.

Patented May 30, 1893.



Witnesses:

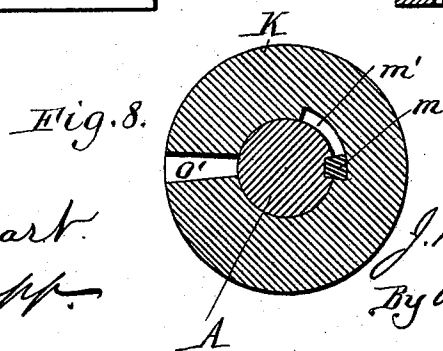
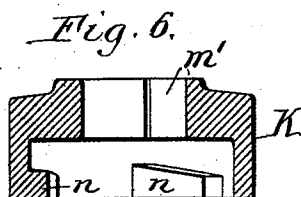
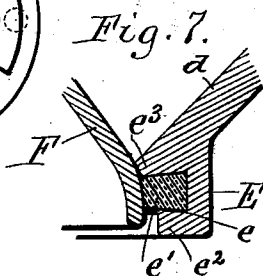
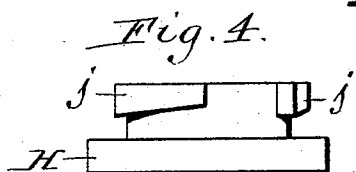
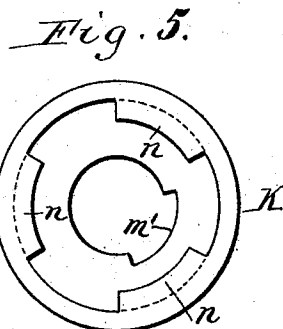
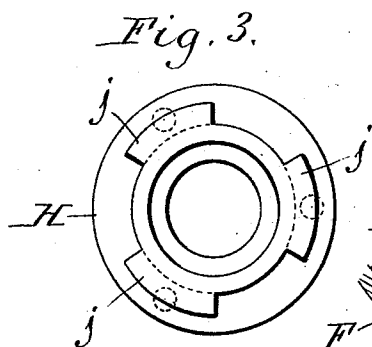
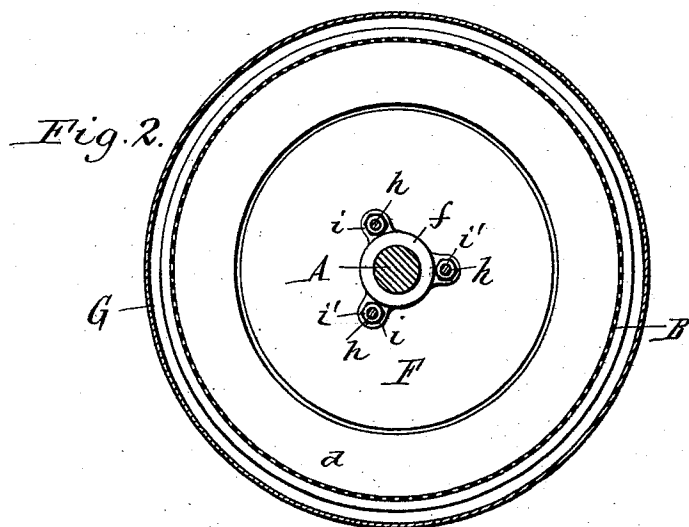
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UNITED STATES PATENT OFFICE.

JOSEPH M. DUNCAN, OF SILVER SPRINGS, NEW YORK.

CENTRIFUGAL SALT-DRIER.

SPECIFICATION forming part of Letters Patent No. 498,383, dated May 30, 1893.

Application filed March 31, 1893. Serial No. 468,520. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. DUNCAN, a citizen of the United States, residing at Silver Springs, in the county of Wyoming and State of New York, have invented new and useful Improvements in Centrifugal Salt-Driers, of which the following is a specification.

This invention relates to that class of centrifugal drying machines which are provided with a movable valve in the bottom for discharging the salt, or other material, after it is dried.

The objects of my invention are to provide means whereby the valve is rendered watertight when closed, and to provide a simple and reliable coupling or holding device whereby the valve is held against its seat.

In the accompanying drawings consisting of two sheets: Figure 1 is a vertical section of a centrifugal salt drier, provided with my improvements. Fig. 2 is a horizontal section in line 2—2, Fig. 1. Fig. 3 is a top plan view, on an enlarged scale, of the lower coupling sleeve whereby the valve is held in its raised position. Fig. 4 is a side elevation thereof. Fig. 5 is a bottom plan view, on an enlarged scale, of the upper coupling sleeve whereby the valve is held in its raised position. Fig. 6 is a sectional elevation thereof. Fig. 7 is an enlarged sectional view of a portion of the valve and its seat. Fig. 8 is a horizontal section, on an enlarged scale, in line 8—8, Fig. 1.

Like letters of reference refer to like parts in the several figures.

A represents the vertical driving spindle which is journaled at its upper and lower ends in bearings *a* *a'* and which is provided near its upper end with a driving pulley *a*².

B represents the perforated basket which receives the wet salt to be dried. This basket is supported at its upper end by a spider C secured to the spindle, and is provided at its lower end with an inwardly tapering flange *d*. The inner edge of the flange *d* is provided with a depending collar E, having in its inner face an annular groove *e* which receives a packing ring or gasket *e'* of rubber or similar flexible material. The inner face of this packing ring projects inwardly beyond the lower portion *e*² of the collar, while the upper portion *e*³ of the collar projects in-

wardly beyond the packing ring, as represented in Fig. 7.

F represents the vertically movable conical valve, arranged in the opening of the bottom, and provided with a sleeve *f* which is mounted on the spindle below the spider, so as to slide vertically on the spindle in opening and closing the valve. When the valve is raised, its marginal portion bears against the rubber packing ring and forms a perfectly watertight joint with the bottom flange.

In centrifugal salt driers, as heretofore constructed, the marginal portion of the valve was seated against a plain metallic face formed on the inner edge of the collar E. With this construction it is difficult to maintain a tight joint between the valve and the seat, and the liquid often leaks through the joint. By providing the flange of the basket with a rubber packing ring against which the valve seats itself, the joint between the bottom of the basket and the valve is made absolutely tight, thereby keeping the space underneath the basket perfectly dry. The inwardly projecting portion of the collar above the packing ring forms a stop which positively limits the upward movement of the valve, and prevents the marginal portion of the latter from being wedged upwardly beyond the packing ring.

G represents the stationary curb or case which surrounds the basket, and is provided at its lower end with an annular trough *G'*.

The valve is held in its raised or closed position by a coupling or holding device which is constructed as follows:—H represents a lower coupling sleeve, which is capable of sliding vertically on the spindle, and which is connected with the valve by upright lifting rods *h*, arranged to slide in vertical openings formed in the hub of the spider C. The screw-threaded lower ends of the lifting rods pass through lugs *i*, arranged on the sleeve of the valve, and are adjustably secured thereto by screw nuts *i'* *i*², applied to the lifting rods on the upper and lower sides of the lugs *i*. The upper contracted portion of the lower coupling sleeve is provided with three outwardly projecting equidistant lugs *j*. K represents an upper coupling sleeve which couples with the lower coupling sleeve for

holding the valve in its closed position. The upper coupling sleeve is held against vertical movement on the spindle by collars *l* *l'* secured to the spindle above and below the upper coupling sleeve, but is permitted to turn on the spindle. This turning movement is limited by a key or stop *m*, secured to the spindle and engaging in a segmental notch *m'* formed in the bore of the upper coupling sleeve, as represented in Fig. 8. The upper coupling sleeve is provided in its under side with a cavity which receives the upper portion of the lower coupling sleeve, and the upper sleeve is provided with three inwardly projecting lugs *n* arranged equidistant and adapted to enter this cavity. Upon raising the valve, the lugs of the lower coupling sleeve pass upwardly between the lugs of the upper coupling sleeve and stand above the lugs of the latter when the valve rests against its seat. Upon turning the upper coupling sleeve, when the parts are in this position, the lugs of the upper sleeve are moved underneath the lugs of the lower coupling sleeve, whereby the lower sleeve is coupled to the upper sleeve and the valve is prevented from descending. The contiguous faces of the lugs are preferably inclined in opposite directions, so that, upon turning the upper coupling sleeve, the valve is drawn firmly against its seat, thereby taking up any wear on the valve or its seat. When the valve is to be opened, the upper coupling sleeve is turned until its lugs are moved from underneath the lugs of the lower coupling sleeve. The valve and lower sleeve now drop and the dried salt is discharged through the opening in the bottom of the basket. The upper coupling sleeve is preferably turned by means of a handle *o* which is inserted in a socket *o'* formed in the sleeve. The valve is usually raised by applying a forked lever against the under side of the lower coupling sleeve, but this may be accomplished in any other suitable manner.

I claim as my invention—

1. In a centrifugal salt drier the combination with the spindle, and the perforated basket provided at its lower end with an internal annular flange, said flange having in its inner face an annular groove and a flexible packing ring arranged in said groove, of a valve adapted to bear with its marginal portion against said packing ring and close the bottom of the basket, substantially as set forth.
2. In a centrifugal salt drier the combination with the spindle, and the perforated basket provided at its lower end with an internal annular flange, said flange having in its inner face an annular groove, a flexible packing ring arranged in said groove, and above the packing ring an annular stop projecting inwardly beyond said packing ring, of a ver-

tically movable valve, adapted to seat itself with its marginal portion against said packing ring and limited in its upward movement by said stop, substantially as set forth.

3. In a centrifugal salt drier the combination with the spindle, the basket mounted thereon, and the vertically movable valve adapted to close the bottom of the basket, of a lower coupling sleeve connected with the valve and arranged to slide vertically upon the spindle and an upper coupling sleeve held against vertical movement on the spindle but adapted to turn on the same and interlock with the lower coupling sleeve for holding the valve in its closed position, substantially as set forth.

4. In a centrifugal salt drier the combination with the spindle, the basket mounted thereon, and the vertically movable valve adapted to close the bottom of the basket, of a lower coupling sleeve connected with the valve and arranged to slide vertically on the spindle and provided on its upper side with lugs, and an upper coupling sleeve held against vertical movement on the spindle but arranged to turn on the spindle, and provided on its under side with lugs adapted to interlock with the lugs of the lower coupling sleeve, substantially as set forth.

5. In a centrifugal salt drier the combination with the spindle, the basket mounted thereon, and the vertically movable valve adapted to close the bottom of the basket, of a lower coupling sleeve connected with the valve, capable of vertical movement on the spindle and provided with lugs, an upper coupling sleeve arranged to turn on the spindle and provided with lugs adapted to interlock with the lugs of the lower coupling sleeve, and collars secured to the spindle above and below the upper coupling sleeve, substantially as set forth.

6. In a centrifugal salt drier the combination with the spindle, the basket mounted thereon, and the vertically movable valve adapted to close the bottom of the basket, of a lower coupling sleeve connected with the valve, capable of vertical movement on the spindle and provided with lugs, an upper coupling sleeve held against vertical movement on the spindle and provided with a segmental notch in its bore and with lugs adapted to engage with the lugs of the lower coupling sleeve, and a stop arranged on the spindle and engaging in said segmental notch, substantially as set forth.

Witness my hand this 23d day of March, 1893.

JOSEPH M. DUNCAN.

Witnesses:

M. E. CARMAN,
M. L. LAMBERSON.