No. 670,963. Patented Apr. 2, 1901.

A. G. & R. J. LOGEMANN.

LIQUID AND SOLID SEPARATING MACHINE.

(No Model.) (Application filed Sept. 27, 1900.)

FIG. 2

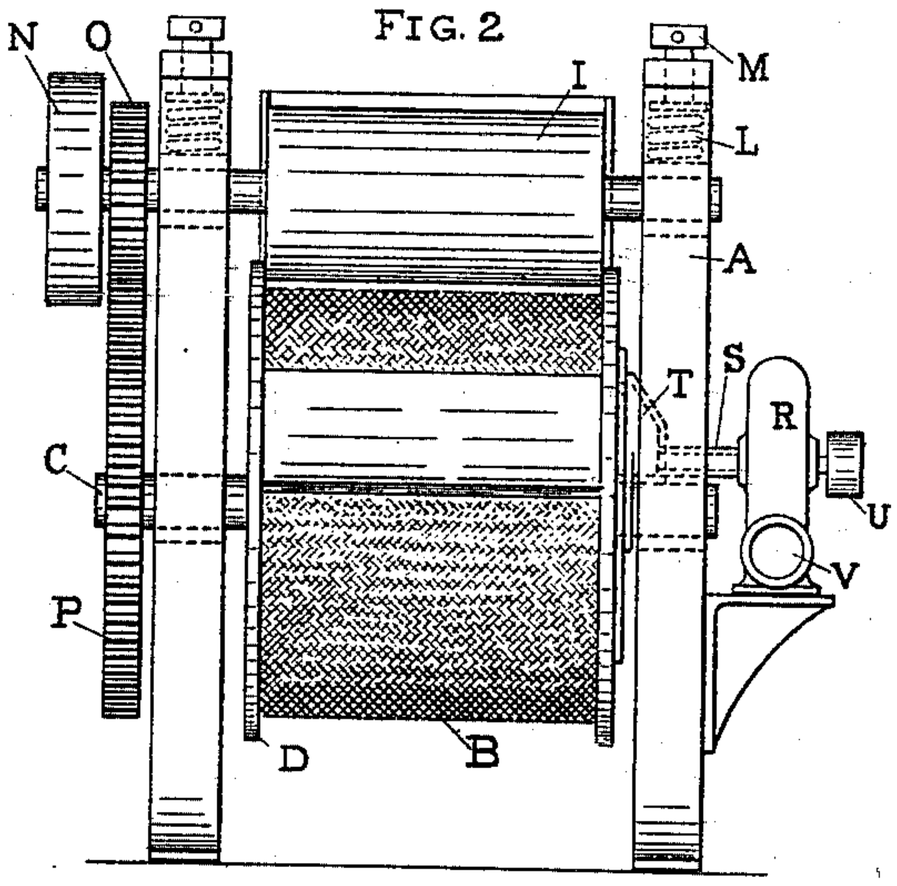


FIG. 3

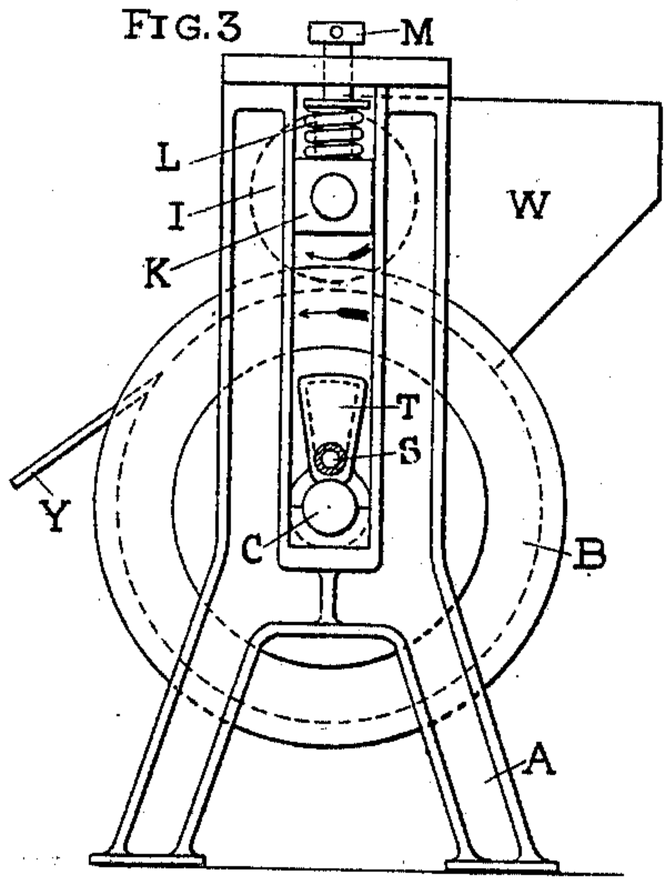


FIG. 1

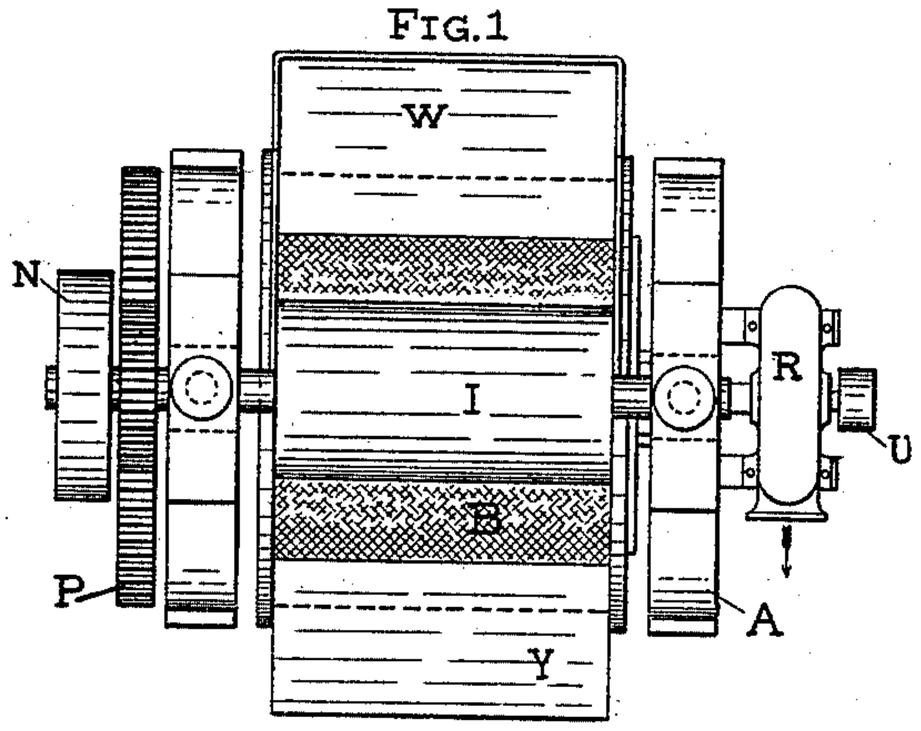


FIG. 6.

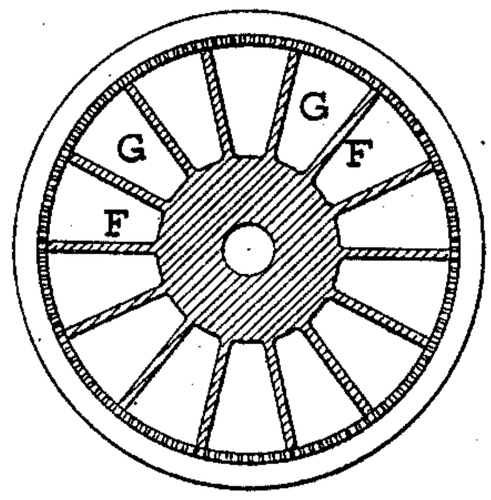


FIG. 5

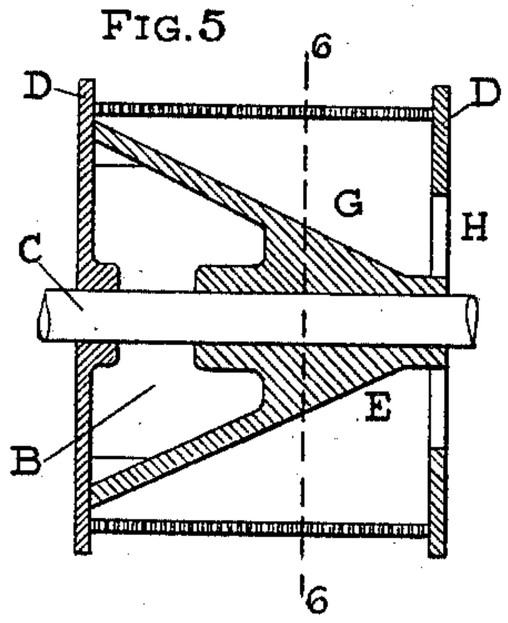
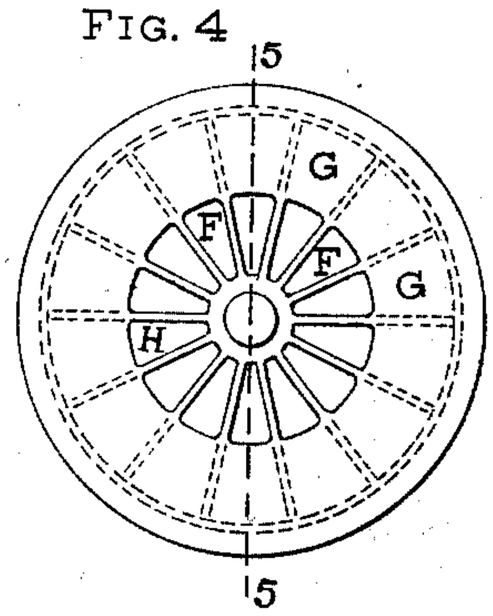


FIG. 4



WITNESSES

G. A. Gerdtzen
Robt. F. Dorr.

INVENTORS

Adolph G. Logemann
Rudolph J. Logemann
By Benedict & Morsell
ATTORNEYS

UNITED STATES PATENT OFFICE.

ADOLPH G. LOGEMANN AND RUDOLPH J. LOGEMANN, OF MILWAUKEE, WISCONSIN.

LIQUID AND SOLID SEPARATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,963, dated April 2, 1901.

Application filed September 27, 1900. Serial No. 31,228. (No model.)

To all whom it may concern:

Be it known that we, ADOLPH G. LOGEMANN and RUDOLPH J. LOGEMANN, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Liquid and Solid Separating-Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

Our invention relates to improvements in machines adapted to extract or separate liquid from solid matter, thereby to a certain extent desiccating the solid matter. The machines are adapted for use in many fields of enterprise. As an instance of the uses to which such machines may be put, it is often desirable to separate and withdraw the liquid or moisture in refuse malt and hops at breweries or elsewhere for saving the solid material of such refuse and converting it into dry valuable material.

The invention consists of the machine, its parts, and combinations of parts, as herein described and claimed, or the equivalents thereof.

In the drawings, Figure 1 is a top plan view of the improved machine. Fig. 2 is a side elevation of the machine. Fig. 3 is an end elevation with fan omitted. Fig. 4 is an end view of a drum forming a part of the machine. Fig. 5 is a longitudinal section of the drum on line 5 5 of Fig. 4. Fig. 6 is a transverse section of the drum on line 6 6 of Fig. 5.

In the drawings, A is a frame of suitable size and form to properly support the operative mechanism. A hollow cylindrical drum B, having a shaft or journal C, is mounted rotatably in the frame. The periphery of the drum is perforated or porous and the end walls of the drum project radially as annular flanges D. The drum is provided with a hub or core member E, the exterior surface of which is preferably in conical form, the longitudinal axis of the cone being coincident with the shaft or axis of the drum. Between this core member and the periphery of the drum and extending from end to end of the drum a number of partitions F F are provided, which partitions are advisably in radial planes and divide the space inside the drum exterior to the hub into a number of drum-chambers G G. Each of these drum-chambers is provided with a port H, advisably made through the end of the drum near the axis of the drum.

A compressing-roller I is provided with a shaft or journals by means of which it is mounted rotatively in boxes K K, slidable vertically in ways therefor in the frame. The roller I is disposed parallel with the drum and adjacent thereto, the roller being of such length as just to fit between the flanges D of the drum. The roller I is held yieldingly near to the drum by springs L L, interposed between the boxes K and tension-screws M M, turning by their threads through the frame against the springs. The shaft or journal of the roller I is provided with a pulley N for transmitting motion to the roller, and a pinion O on the journal of the roller meshes with a cog-wheel P on the journal of the drum.

A suction device for producing a suction or partial vacuum consists of a centrifugal wheel or fan in a case R and a suction-pipe S, provided with an enlarged and hood-like mouth T, the open end of which pipe or mouth is of such form as to fit against that end of the drum in which are the ports of the drum-chambers. The shaft of the suction-fan is provided with a band-pulley U, and the fan-case is provided with a discharging-aperture V. The form of the suction-fan is not material, as any fan or pump adapted for this purpose could be employed instead of one of the form indicated in the drawings. These parts are so placed in relation to each other that as the drum rotates and the port of each chamber comes opposite the mouth of the suction-pipe of the fan the chamber and the suction-pipe form for the time being a continuous passage-way between that portion of the perforated periphery of the drum which forms a side of that chamber and the fan. The mouth of the suction-pipe is so placed that during the time the mouth is opposite the port of a chamber that part of the perforated periphery forming a side of that chamber is at or near the line or area of pressure between the roller and the drum.

A hopper W is adapted to receive the material and feed it into the space between the

drum and the roller. An apron or tail-chute Y is adapted for carrying the solid material away from the drum after it has passed between the drum and the roller and the liquid has been withdrawn therefrom.

In use the material to be operated upon is placed in quantity in the hopper W, and as the roller and the drum rotate is passed between them and is pressed. As each drum-chamber during the time it passes the line or area of pressure between the roller and the drum is in communication with the suction-fan, a suction or partial vacuum is applied to the material through the perforated or porous periphery of the cylinder during the time it is under pressure. Under the simultaneous action of the pressure and the suction upon the material the liquid separates from the solid matter and passes into a chamber of the drum, whence it is discharged either by passing through the fan or by gravity when each chamber reaches its lowest position. The solid portion of the material is carried along by the surface of the drum and is removed therefrom and discharged by the tail-chute Y.

What we claim as our invention is—

1. In combination a perforated pressure-resisting surface, a means adjacent to the perforated surface adapted to press material between it and said perforated surface, and a suction device applied exclusively to the perforated surface opposite the pressing means adapted to draw through the perforated surface on the material in the area under pressure only.

2. In combination, a roller, an adjacent hollow cylinder provided with a perforated or porous periphery, means for rotating the roller and cylinder, and a suction device, all so placed in relation to each other as to simultaneously apply pressure and a suction to the material, the suction being applied to that portion of the material only that is under pressure or closely adjacent thereto.

3. In combination, a pressure-roller, a complementary pressure-roller comprising a hollow cylinder having a perforated or porous periphery and interior longitudinal walls in radial planes dividing the interior of the roller into longitudinal segmental chambers each having a discharge-port, and means adapted to apply suction at the discharge-port and acting through the periphery of the chamber on the material in the area under pressure between the two rollers.

4. In combination, a roller, an adjacent hollow drum provided with a perforated or porous periphery and with longitudinal chambers each having a port through the end of the drum, means for rotating the roller and the drum, and a suction device the mouth of which is successively in communication with the ports of the chambers, all so placed in relation to each other as to press the material to be treated as it passes between the roller and the drum and simultaneously to apply a suction through the chambers and the perforated periphery to the material to be treated.

5. In combination, a driven roller, an adjacent parallel hollow drum having a perforated periphery and a cone-shaped core member, longitudinal partitions in the drum dividing it into chambers each of which is provided with a port, and a suction device adapted to withdraw liquid from the material being pressed.

6. In combination, a hollow rotating drum having a perforated periphery and longitudinal chambers provided with ports, a suction device applied to said ports, a rotating roller mounted in yielding boxes and disposed parallel with and adjacent to said drum, and a suction device applied to the ports of the drum.

7. In combination, a hollow rotating drum having a perforated periphery, annular radially-projecting flanges at its ends and longitudinal chambers provided with ports, a suction device applied to said ports, a rotating roller mounted in yielding boxes, and disposed parallel with and adjacent to said drum between said flanges thereon, and a suction device applied to the ports of the drum.

In testimony whereof we affix our signatures in presence of two witnesses.

ADOLPH G. LOGEMANN.
RUDOLPH J. LOGEMANN.

Witnesses:
C. T. BENEDICT,
G. A. GERDTZEN.