No. 755,989. PATENTED MAR. 29, 1904.

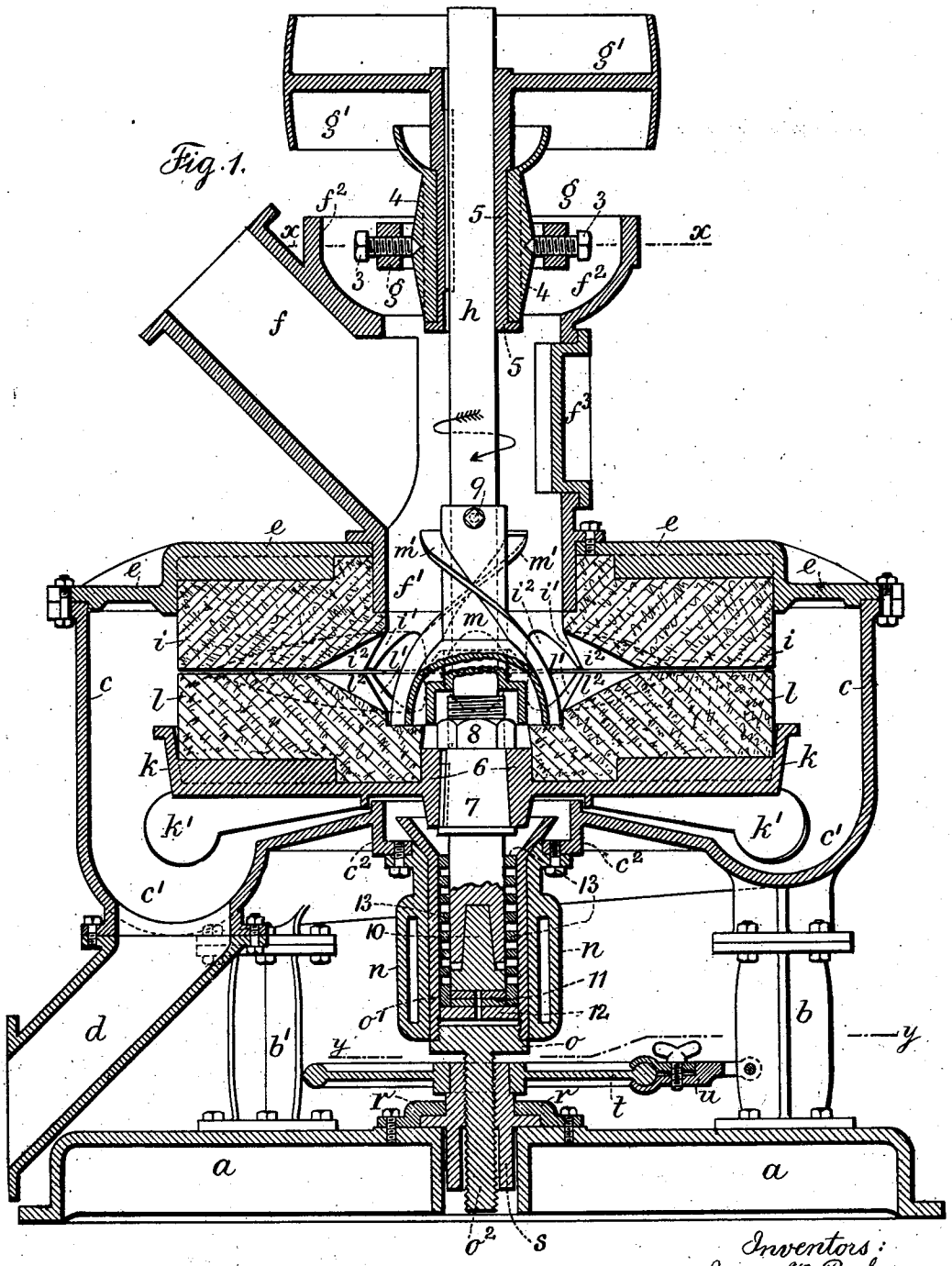
J. H. BAKER, G. F. SHEVLIN & F. H. BAKER.

WOOD PULP GRINDER.

APPLICATION FILED JULY 16, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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WOOD PULP GRINDER.

APPLICATION FILED JULY 16, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

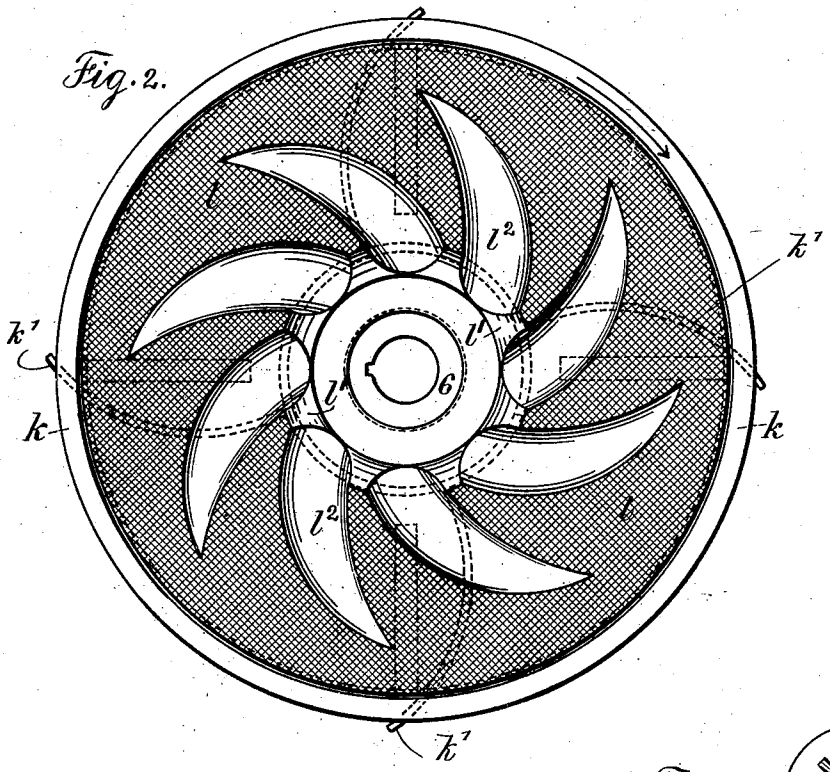


Fig. 3.

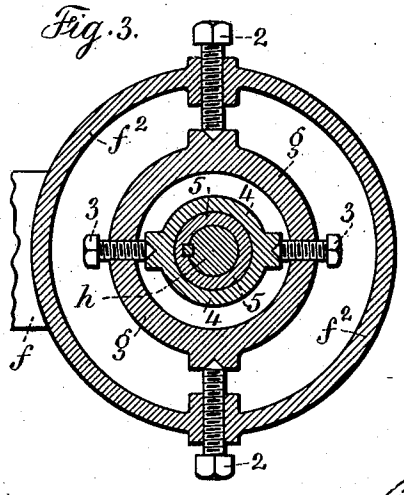


Fig. 4.

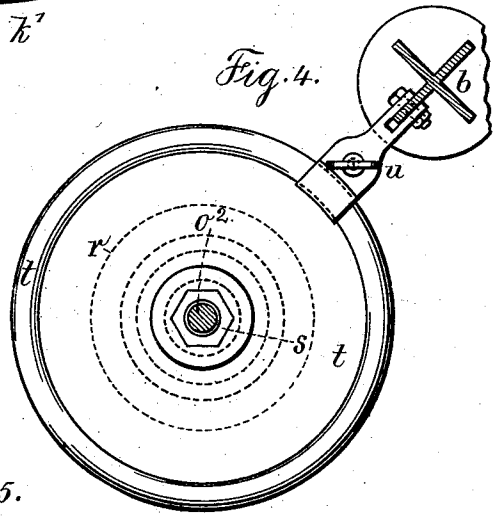
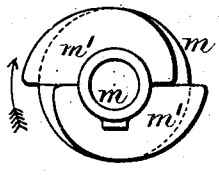


Fig. 5.



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No. 755,989. Patented March 29, 1904.

UNITED STATES PATENT OFFICE.

JAMES H. BAKER, GEORGE F. SHEVLIN, AND FREDERICK H. BAKER, OF SARATOGA SPRINGS, NEW YORK, ASSIGNORS TO BAKER AND SHEVLIN COMPANY, OF SARATOGA SPRINGS, NEW YORK, A CORPORATION OF NEW YORK.

WOOD-PULP GRINDER.

SPECIFICATION forming part of Letters Patent No. 755,989, dated March 29, 1904.

Application filed July 16, 1903. Serial No. 165,752. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. BAKER, GEORGE F. SHEVLIN, and FREDERICK H. BAKER, citizens of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented an Improvement in Wood-Pulp Grinders, of which the following is a specification.

Our present invention is designed as an improvement upon the device shown and described in our Letters Patent No. 614,316, granted November 15, 1898, and the same relates to a device for grinding and refining the residuum from ground-wood, sulfite, and soda pulp, with the object of utilizing what heretofore has usually been waste materials or screenings. In our present improvement we employ grinding-stones horizontally placed, the one fixed and stationary and the other adapted to revolve at a high speed. The inner adjacent corners of the stones are beveled or cut away, and the opposite faces are provided with tapering channels to receive the entering stock and convey the same between the roughened grinding-faces of the stones.

We provide entrance and exit means for the materials being treated, means in the center of the stones for pulling down the entering materials and forcing the same outward toward the stones and into their channels, and means for raising and lowering the lower and revoluble stone, so as to adjust the same with reference to the stationary stone, and other devices for holding the parts as adjusted, all of which are hereinafter more particularly described.

In the drawings, Figure 1 is a vertical section representing the machine embodying our improvements. Fig. 2 is a plan of the lower stone and the platform structure carrying the same. Fig. 3 is a sectional plan at $x\ x$ of Fig 1. Fig. 4 is a sectional plan at $y\ y$ of Fig. 1, and Fig. 5 is a plan of the worm or device in the center of the stones for pulling down the entering materials and forcing the same outward.

The cast base a is preferably provided with a securing flange, and leg-supports $b\ b'$ are secured thereto, and at their upper ends a hopper c of cast metal and of circular form is connected to these leg-supports. The base of the hopper is made as a curved annular trough c', inclined at both sides from a given point to an opposite discharge-aperture, and the same is formed with parts adapted to set upon and be connected to said leg-supports.

d is a discharge-throat extending downward from and connected to the discharge-aperture of the hopper. The hopper is provided with a top or cover e, preferably of cast metal, with an open center and with ribs upon the under side, and to the under side of the cover the upper or stationary stone i is connected and made fast in any desired or well-known manner. The cover and the stone are each made with an open center, which open centers are of substantially the same diameter.

The devices providing an entrance for the residuum from ground-wood, sulfite, or soda pulp comprise a casting in which there is an inclined throat f, a circular base f', fitting within the open centers of the cover and stationary stone, and a dishing or concave top, the said casting having an aperture providing a hand-hole approximately opposite to the inclined throat and closed with a removable cover f^3. There are adjusting-screws 2 passing through this top f^2 at opposite sides, and a ring or annulus g, concentric with the said top f^2 and which is supported and centered by the screws 2. Through the annulus or ring g there are other adjusting-screws, 3, at opposite points and intermediate of the screws 2, which pass through the ring or annulus g and take bearings in the sleeve 4 to support the same and to hold said sleeve in the axial center of the machine.

A pulley g' is provided with a pulley-sleeve 5, and this sleeve 5 is within the bearing-sleeve 4 and surrounds the shaft h, said pulley-sleeve being connected to said shaft h by a spline and groove, so that the two are caused to turn together, the power being communicated for the rotation of the shaft by said

pulley g' and sleeve 5. We provide a circular platform k, having a rising edge or peripheral flange and spaced-apart internal ribs, and a hub 6 is made integral with this circular platform and has a tapering aperture. This circular platform is provided with beater-wings k' on the under side, which are preferably formed integral therewith. These wings are curved in plan, Fig. 2, and are preferably tapering, with semicircular ends, as shown in Fig. 1, and the office of these beater-wings is to move the stock that is being treated after the same passes out of the stones into the annular trough c' and progressively move the same toward the discharge-throat. The revoluble stone l is received upon the platform k and is secured thereto in any desired or well-known manner.

The shaft h is provided with a tapering enlargement 7 and a shoulder, and the hub 6 of said platform fits upon the taper enlargement, rests upon the shoulder, and is preferably connected to the taper enlargement by a spline and slot. The shaft h above the taper enlargement 7 is threaded, the threads terminating at the taper enlargement, and upon this threaded portion is a nut 8, the office of which is to force the hub 6 of the platform down upon the taper enlargement to the shoulder and connect the said parts securely. The stationary stone i and the revoluble stone l have their inner adjacent corners i' and l' cut away, and the juxtaposed faces of said stones are provided with curved tapering channels i^2 l^2, and the flat juxtaposed surfaces are suitably roughened. Within and between the stones there is thus created quite an area or receptacle for the entering stock or residuum from the ground-wood, sulfite, or soda pulp, and we employ a concave worm m, surrounding the shaft h and connected to the shaft by a bolt 9, which prevents displacement. The base of this conical worm is hollow and fits over the nut 8 and the adjacent threaded portion of the shaft and rests upon the surface of the stone in the central recess, and the surface of said worm m is provided with blades m', that are spirally arranged upon the conical surface of the worm, the function of said blades being to both draw down the residue stock into the machine and to force the same outward into the cut-away portions and channels of the stones.

The annular trough of the hopper is provided with a ring-center c^2, and a hollow sleeve n is securely connected thereto. The lower end of the shaft h carries a steel step 10, and this in turn rests upon the pair of steel disks 11, which are perforated, and the steel disks in turn rest upon a steel plate 12, that is preferably both grooved and perforated. Around the lower end of the shaft and the steel step, as well as the said disks, there is a bronze bushing 13, perforated, and we provide a bottom step-block o and a step-sleeve o', connected to the periphery of said step-block, the step-block being made with a screw-stem o^2, which extends downward into a central aperture in the base a.

We provide a circular apertured plate r, secured to the center of the cast base a, and a sleeve s, flanged and interiorly threaded, occupies a position in the recessed center of the base, and the flange thereof comes between the plate r and the surface of said base, the said sleeve being free to rotate, but being fixed with regard to an upward, downward, or lateral movement. A hand-wheel t is fast upon the periphery of the sleeve s at its upper end, and we provide a clamp u, adapted at one end to be connected to the hand-wheel t and its other end to the leg-support b. The hollow sleeve structure n, the steel step and disks, the steel plate, and the bronze bushing, while convenient in this structure, form no necessary part of our present invention, as the same have been heretofore described and claimed in other and prior applications and patents by us, the same forming devices for oiling and cooling the bearing at the lower end of the high-speed shaft h.

In the operation of the structure the step-sleeve o' and the hollow sleeve n bear a fixed relation to one another—that is to say, we prefer to provide a slot and spline connecting the two, so as to prevent the rotation of one with reference to the other, but yet to make a vertical movement of the one with reference to the other possible, in view of which the step-block o and the screw-stem o^2 are adapted to rise and fall, but not to turn. The turning movement is produced by the hand-wheel t and the sleeve s, which are connected rotatably together, said sleeve being interiorly threaded to match the exterior thread of the screw-stem o^2, so that when the hand-wheel t is rotated and the sleeve s with it a rising or falling movement is imparted to the said screw-stem, step-block, the step-sleeve and step, the shaft h, the platform k, and the revoluble stone l, so as to bring the juxtaposed surfaces of the respective stones nearer together or farther apart.

The clamping device u is preferably pivotally connected to the leg-support b and grasps the peripheral rim of the hand-wheel t, and thus holds the wheel in position, and thereby retains the vertically-adjustable parts in position as determined and set.

We claim as our invention—

1. The combination with a circular hopper, a cover therefor and stationary stone carried thereby, of a circular platform, a revoluble stone carried thereby, a shaft to which the platform is secured, a step at the lower end of the shaft, devices upon which the said step rests, a step-block having an integral screw-stem, a step-sleeve connected to the step-block and surrounding the shaft and step, an interiorly-threaded flanged sleeve secured to

said step, a hand-wheel connected to said sleeve, and a plate connected to the bed of the machine and receiving said flanged sleeve, and a clamp for connecting the hand-wheel to a fixed point.

2. The combination in a wood-pulp grinder with a base and leg-supports, of a circular horizontally-placed hopper having a curved annular trough inclined in opposite directions toward a discharge-throat, a circular, horizontally-placed cover or top having an open center, a fixed or stationary stone connected to the under side of said cover and also having an open center, a circular horizontally-placed platform, a vertical shaft, a horizontally-placed revoluble stone connected to said platform, devices for feeding the stock or residuum to the center of the stones for their operation, and devices for supporting the revoluble stone and adjusting the surfaces of the stones with reference to one another.

3. The combination in a wood-pulp grinder, of a circular horizontally-placed hopper having a curved annular trough inclined in opposite directions toward a discharge-throat, a circular horizontally-placed cover or top having an open center, a fixed or stationary stone connected to the under side of said cover and also having an open center, a circular horizontally-placed platform, a vertical shaft, a horizontally-placed revoluble stone connected to said platform, said circular platform having a flanged periphery and beater-wings on the under side of the platform curved in plan and tapering in elevation and moving through the curved annular trough of the hopper for bringing the material contained therein to the discharge-aperture, devices for feeding the stock or residuum to the center of the stones for their operation, and devices for supporting the revoluble stone and adjusting the surfaces of the stones with reference to one another.

4. The combination in a wood-pulp grinder with a base and leg-supports, of a circular horizontally-placed hopper having a curved annular trough inclined in opposite directions toward a discharge-throat, a circular horizontally-placed cover or top having an open center, a fixed or stationary stone connected to the under side of said cover and also having an open center, a circular horizontally-placed platform, a vertical shaft, a horizontally-placed revoluble stone connected to said platform, said fixed and stationary stones having their inner adjacent corners beveled or cut away and the opposite juxtaposed faces of said stones provided with taper channels and their flat juxtaposed surfaces roughened.

5. The combination in a wood-pulp grinder, with a base and leg-supports, of a circular horizontally-placed hopper having a curved annular trough inclined in opposite directions toward a discharge-throat, a circular horizontally-placed cover or top having an open center, a fixed or stationary stone connected to the under side of said cover and also having an open center, a circular horizontally-placed platform, a vertical shaft, a horizontally-placed revoluble stone connected to said platform, a conical worm structure surrounding the driving-shaft within the hollow centers of the respective stones and acting to pull down the stock and to force the same out laterally.

6. The combination in a wood-pulp grinder with a base and leg-supports, of a circular horizontally-placed hopper having a curved annular trough inclined in opposite directions toward a discharge-throat, a circular horizontally-placed cover or top having an open center, a fixed or stationary stone connected to the under side of said cover and also having an open center, a circular horizontally-placed platform, a vertical shaft, a horizontally-placed revoluble stone connected to said platform, the said fixed and stationary stones having their inner adjacent corners beveled or cut away and the opposite juxtaposed faces of said stones provided with taper channels and their flat juxtaposed surfaces roughened, and a conical worm device comprising a sleeve, a hollow curved base and spiral surface blades surrounding the driving-shaft and located in the hollow centers of the stones and acting to pull down the material being treated and force the same out laterally into the channels and between the surfaces of the stones.

7. In a wood-pulp grinder, the combination with a circular hopper horizontally placed, of a circular cover also horizontally placed, a stationary stone connected to the under surface of said cover, said cover and stone each having an open center, a structure forming an inlet for the material to be treated and comprising an inclined throat, a circular base fitting the open centers of the cover and stone, a dishing top and a removable hand-hole cover, a vertically-placed central power-shaft, a bearing therefor in the said dishing top, a circular revoluble platform connected to said shaft, a revoluble stone horizontally placed carried by said platform, and a suitable bearing for the lower end of said shaft.

8. In a wood-pulp grinder, the combination with a circular hopper horizontally placed, of a circular cover also horizontally placed, a stationary stone connected to the under surface of said cover, said cover and stone each having an open center, a structure forming an inlet for the material to be treated and comprising an inclined throat, a circular base fitting the open centers of the cover and stone, a dishing top and a removable hand-hole cover, a vertically-placed central power-shaft, a bearing therefor in the said dishing top, a circular revoluble platform connected to said shaft, a revoluble stone horizontally placed carried by said platform, a suitable step-bearing for the lower end of said shaft, adjustable revoluble devices for raising and lowering the shaft,

the circular platform and the revoluble stone to adjust the juxtaposed surfaces of the two stones, and means for clamping the parts as desired.

9. In a wood-pulp grinder, the combination with a horizontally-placed stationary stone having an open center, a circular revoluble platform and horizontally-placed revoluble stone carried thereby having a partial open center, a taper enlargement upon said shaft, a taper hub to said platform fitting said taper enlargement, a screw-threaded part to the shaft adjacent to the taper enlargement, and a nut upon the shaft for holding the hub of the platform securely in position, and a conical worm structure with spirally-arranged surface blades upon said shaft and having a hollow base fitting over the said screw-threaded portion and nut and resting upon the revoluble stone.

Signed by us this 30th day of March, 1903.

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