(No Model.)

J. NORTON, Jr.

BEATING ENGINE.

No. 389,760. Patented Sept. 18, 1888.

Fig. 1.

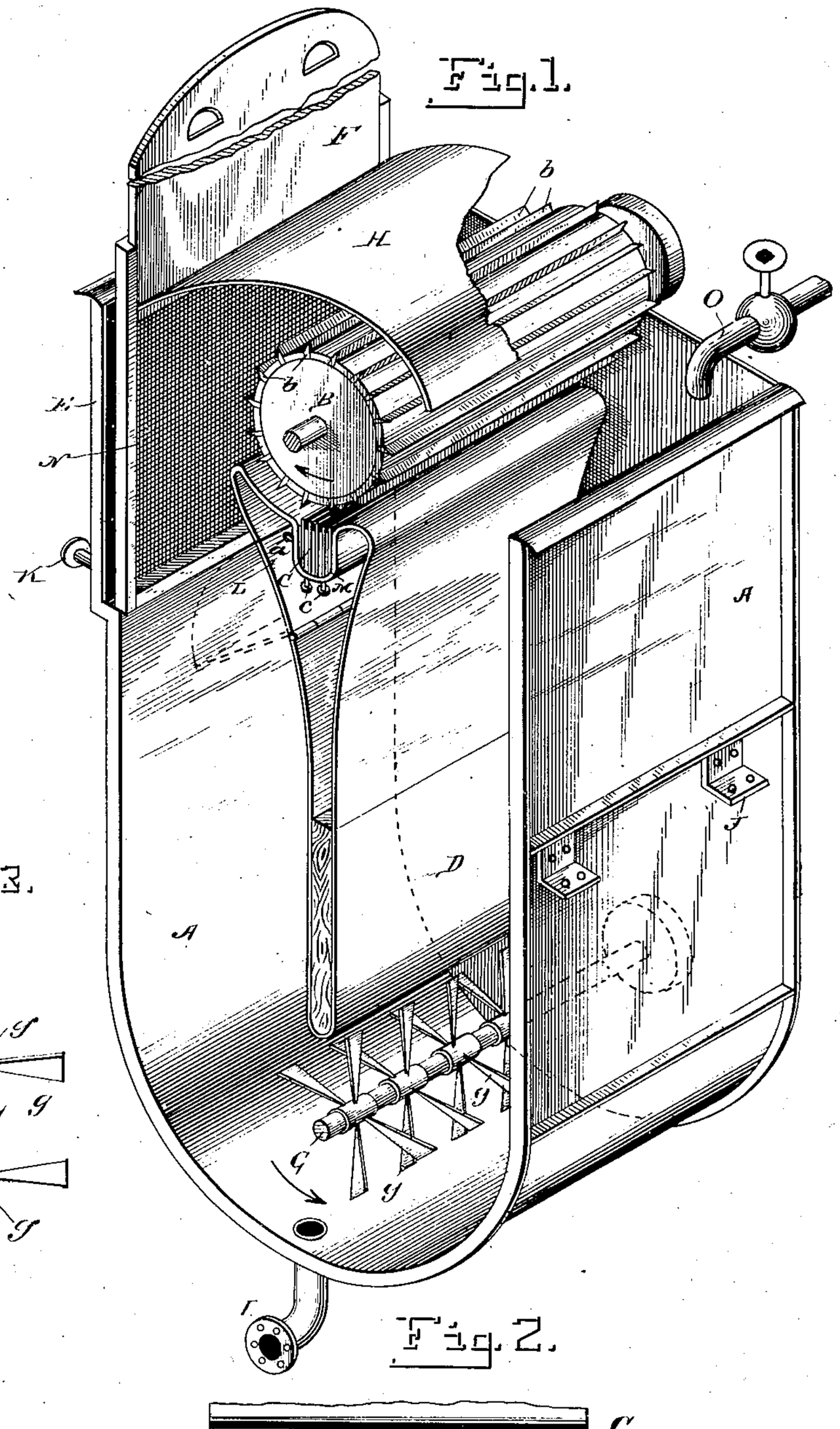

Fig. 2.

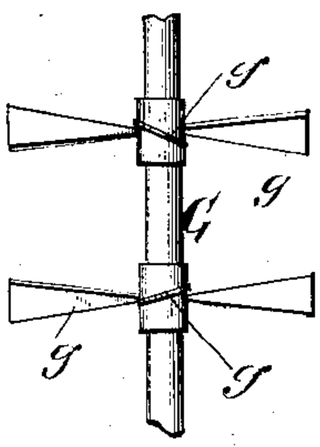

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

JOSHUA NORTON, JR., OF PORTNEUF, QUEBEC, CANADA.

BEATING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 389,760, dated September 18, 1888.

Application filed May 4, 1888. Serial No. 272,849. (No model.) Patented in Canada March 27, 1888, No. 28,773.

To all whom it may concern:

Be it known that I, JOSHUA NORTON, Jr., a resident of Portneuf, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Beating-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, it having been patented in Canada March 27, 1888, No. 28,773.

My invention relates to beating-engines for reducing paper-stock to pulp, and its object is to economize floor-space, increase productive capacity, and to secure more even reduction of fiber.

The invention is shown in the accompanying drawings, wherein—

Figure 1 is a perspective view of the engine, one end of the tub being removed without section. Fig. 2 is a detail plan of certain knives employed. Fig. 3 is a plan view of a portion of the shaft provided with oblique stirring-blades.

In the drawings, A is a vertical tub provided with ears J, by which it may be secured to any suitable support. Within the vertical tub is a central vertical partition, D, (called a "mid-feather,") fixed in the walls of the tub and extending from a point near the top into the lower half of the tub. The lower part of this partition or mid-feather, as shown, is solid, while the upper part is hollow, its walls being upwardly divergent and depressed at the top to form a partial cylindrical trough having a longitudinal recess, M, to receive a series of adjustable stationary knives, C, held in position by set-screws *a*, and raised or lowered by set-screws *c*. In this trough revolves a vertically-adjustable cylinder, B, mounted in bearings upon the walls of the tub and provided with fly-bars *b*, parallel to its axis, passing in any desired degree of proximity to the knives C. A portion, L, of the wall of the mid-feather is hinged to permit access to the set-screws *a c*. The upper surface of the cylinder B is covered by a curb, H, secured to the walls of the tub.

Below the lower edge of the mid-feather D, and parallel thereto, is a shaft, G, revolubly mounted in the walls of the tub and provided with a series of oblique blades, *g*, revolving in different planes with the shaft to which they are fixed. This shaft is rotated by belt or gear connection with the roller-shaft above, or by independent means.

By a slight offset in one of the walls of the tub the portion E is thrown outside of the plane of the body of that wall, and in this plane is inserted a wire screen, N, and by means of a vertically-adjustable board, F, the exposed part of the inner face of the screen may be varied in area as desired. Discharge-tubes I K connect, respectively, with the lower portion of the tub and of the space between the screen N and wall E, and through these liquids may be drawn off continuously or at intervals.

In operation the tub is filled with water and the cylinder B and shaft G are set in motion in the direction indicated by the arrows of the drawings. This motion induces a constant current of water around the mid-feather, and if paper-stock be introduced it is carried between the cylinder fly-bars and knives C and more or less disintegrated. The current throws it against the screen N, through which the dirty water is forced as the material is carried in its downward course, and is discharged through the tube K. From this point the fiber is carried down toward the blades *g*, which, being set obliquely and moving faster than the current, move the fibers both longitudinally and laterally, and prevent too great uniformity in their position with reference to each other. The current again carries the material to the cylinder B, and the operation is repeated as long as desired. If too much water is passing through the screen N, or if the material is sufficiently cleansed, the board F may be lowered so as to reduce the exposed area of the screen, and thereby save it from wear.

Water is introduced into the tub by a pipe, O, or in any other convenient manner.

I have herein shown and described the tub as vertical as contradistinguished from the tub ordinarily used, which is termed "horizontal." It is found from practical experience that there are very great advantages in so constructing the tub, the one now in use by me being nearly four times as deep as it is wide, and for that reason I designate it a "vertical tub."

What I claim is—

1. In a beating-engine, the combination of a tub, a vertical partition extending from a

point somewhat below the top of the tub to a point a little above the bottom of the tub, a series of knives held in the top of said partition, and a beating-roller revolubly mounted above the upper edge of said partition and adapted to beat the material and induce circulation of the liquid around said partition, substantially as set forth.

2. The combination of the vertical partition D, fixed in the tub A, above the bottom thereof, the cylinder B, revolubly mounted immediately over said partition, and provided with fly-bars *b*, the knives C, fixed in the upper edge of said partition, and means for adjusting the distance between the upper edges of the knives C and said fly-bars, substantially as set forth.

3. In a beating-engine, a tub provided with a partial vertical partition whose upper edge is expanded to form a trough, a cluster of knives adjustably fixed on the bottom of said trough, a ribbed cylinder revolubly mounted upon the tub and lying in said trough, and a revolving shaft mounted in the sides of the tub beneath the lower edge of said partition, and provided with a series of oblique stirring and current-producing blades, all combined and co-operating substantially as set forth.

4. The combination, with the tub A, having an offset on one of its sides, of the screen N, separating the space in said offset from the body of the tub, the slide F for varying the size of the exposed portion of said screen, the discharge-pipe K, the partition D, bearing the knives C, and the revoluble beating-cylinder B, substantially as set forth.

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

JOSHUA NORTON, JR.

Witnesses:

FLAVIEN MONDER,

WILLIAM MASON.