J. S. WARREN.

PAPER PULP ENGINE.

No. 183,349. Patented Oct. 17, 1876.

Fig. 1.

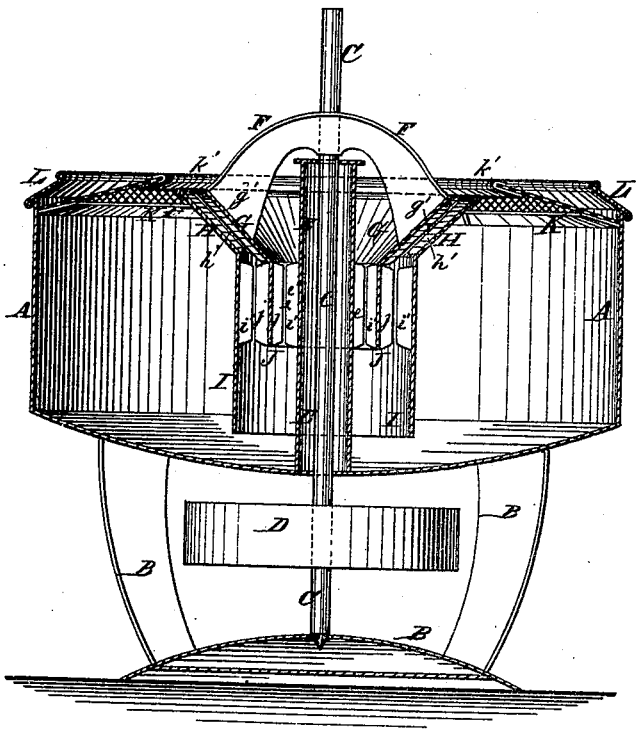
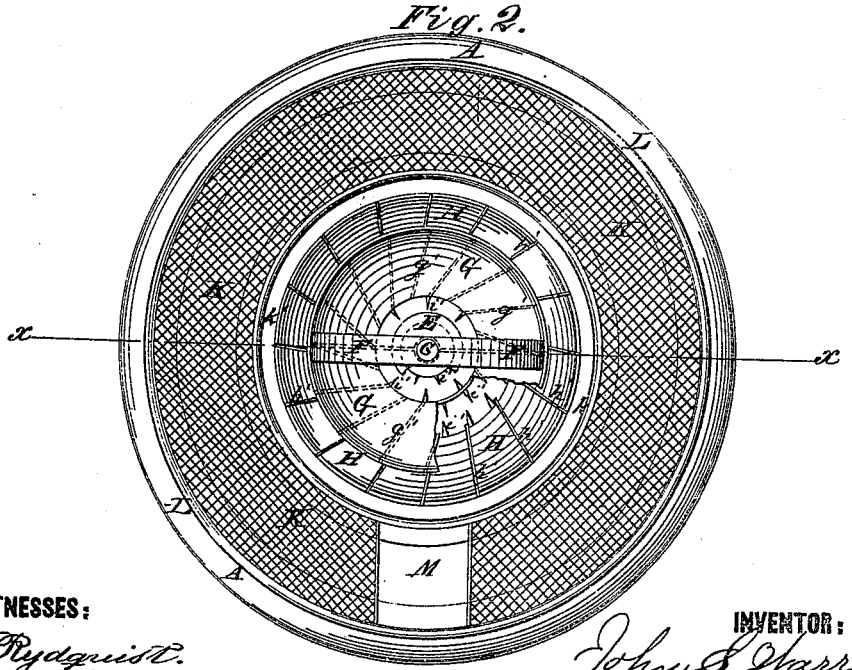


Fig. 2.



WITNESSES:

H. Rydquist.

John Goethals

INVENTOR:

John S. Warren

BY

Munn & Co

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE

JOHN S. WARREN, OF CUMBERLAND MILLS, MAINE.

IMPROVEMENT IN PAPER-PULP ENGINES.

Specification forming part of Letters Patent No. **183,349**, dated October 17, 1876; application filed August 7, 1876.

To all whom it may concern:

Be it known that I, JOHN S. WARREN, of Cumberland Mills, in the county of Cumberland and State of Maine, have invented a new and useful Improvement in Paper-Pulp Engines, of which the following is a specification:

Figure 1 is a vertical section of my improved engine, taken through the line *x x*, Fig. 2. Fig. 2 is a top view of the same.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved engine for beating, grinding, and washing paper-pulp, which shall be simple in construction, effective in operation, and durable, being less subject to wear and less liable to get out of order than engines constructed in the usual way.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

A is a cylindrical curb or case, made with a concaved bottom, and of any suitable size. The case A is supported upon a frame-work, B, in the base of which is formed a step for the lower end of the shaft C. The shaft C is driven by a band passing around a pulley, D, attached to the lower end of said shaft. The shaft C passes up through a hollow column, E, the lower end of which is attached to the bottom of the case A, and in its upper end is formed the upper bearing for the shaft C. The hollow column E rises a little above the top of the case A, and prevents the pulp from ever coming in contact with the shaft C, getting into its bearings, and wearing it. To the shaft C, above the end of the hollow column E, is attached a curved or arched bar or spider, F, to the ends of which is attached an inverted frustum of a hollow cone, G. The cone G is surrounded by a similar frustum of a cone, H, the upper edge of which is connected with and supported from the top of the case A by arms or other suitable means. From the lower edge of the cone H a tube, I, extends nearly to the bottom of the case A, and from the lower edge of the cone G a tube, J, extends downward about half as far as the tube I, and is placed about midway between the tube I and the hollow column E. To the adjacent faces of the cones G H are attached knives g' h'. To the adjacent faces of the tubes I J are attached knives i' j^1, and to the adjacent faces of the tube J and hollow column E are attached knives j^2 e', as shown in Fig. 1. K is a ring or segmental screen, the outer edge of which is attached to the upper edge of the case A. The screen K is made slightly conical, and its inner edge is strengthened by a binding or ring, k'.

In using the machine for beating and grinding, the case A is filled or charged through an opening, M, in the screen K, and power is applied to the shaft C, giving a rotary motion to the cone G, tube J, and their attached knives g' j^1 j^2. This revolution of said parts engenders a centrifugal force, which causes the pulp to flow up through the space between the tubes I J and cones H G, and through the space between the tube and cone J G and the hollow column E, the knives i' j^1 j^2 e' operating upon it during its passage. The pulp, as it is thrown out, passes down the sides of the case A, and in beneath the lower edge of the tube I, thus establishing a circuit and insuring a thorough intermixture of the pulp, the pulp to be operated upon being always taken from the bottom of the case A.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with case A, having opening M in its screen K, of the rotary cone G and tube J, the stationary cone H and tube I, and the series of knives, arranged substantially as shown and described.

JOHN S. WARREN.

Witnesses:

WM. L. LONGLEY,

EDWIN W. AYER.