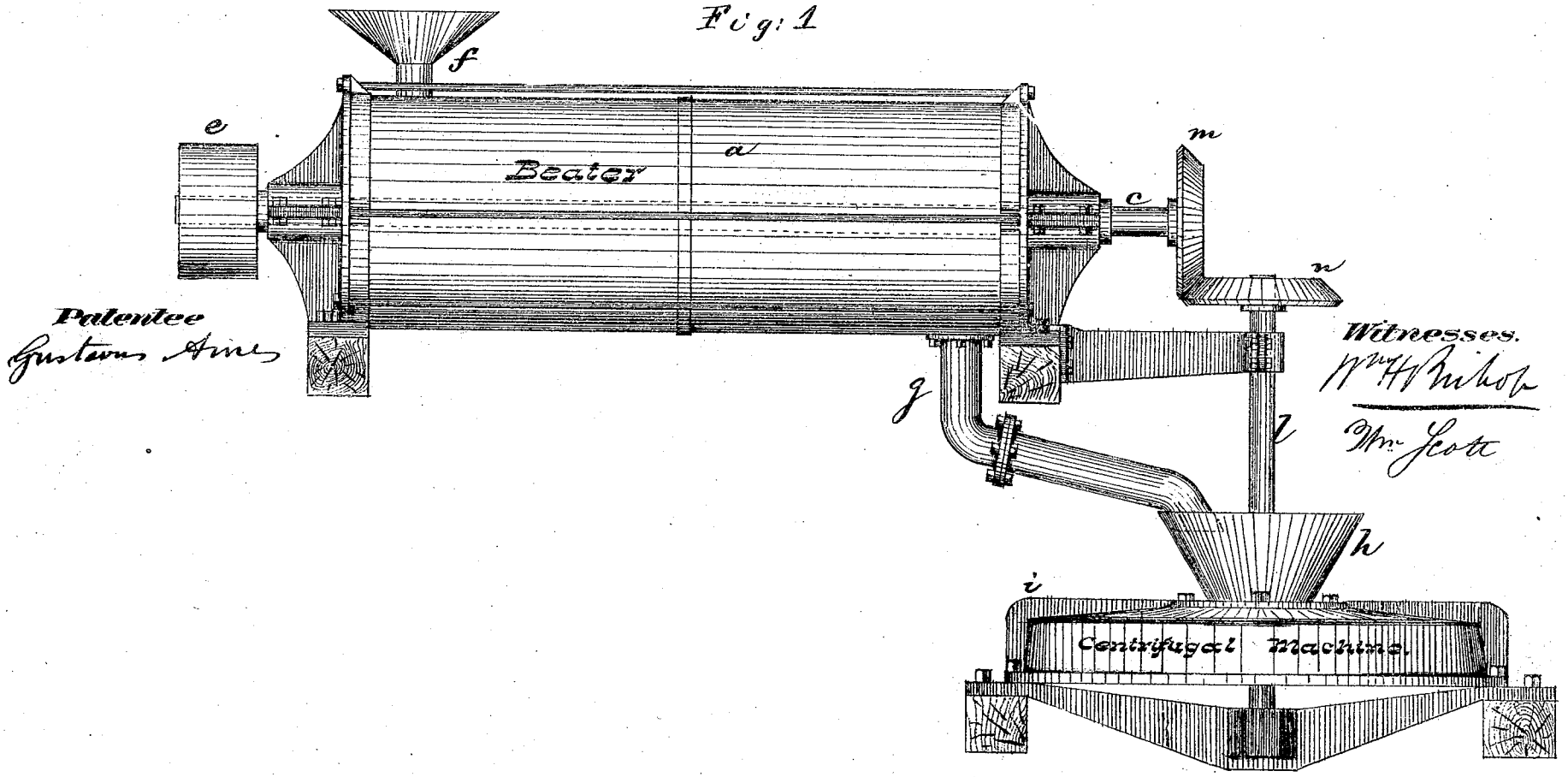
Sheet 1. 3 Sheets

# Gustavus Ames' Patent Pulp Refiner.

PATENTED AUG 15 1871

118092

Fig: 1




Patentee
Gustavus Ames

Witnesses.
Wm H Nichols
Wm Scott

Sheet. R. 3 Sheets

# Gustavus Ames' Patent Pulp Refiner.

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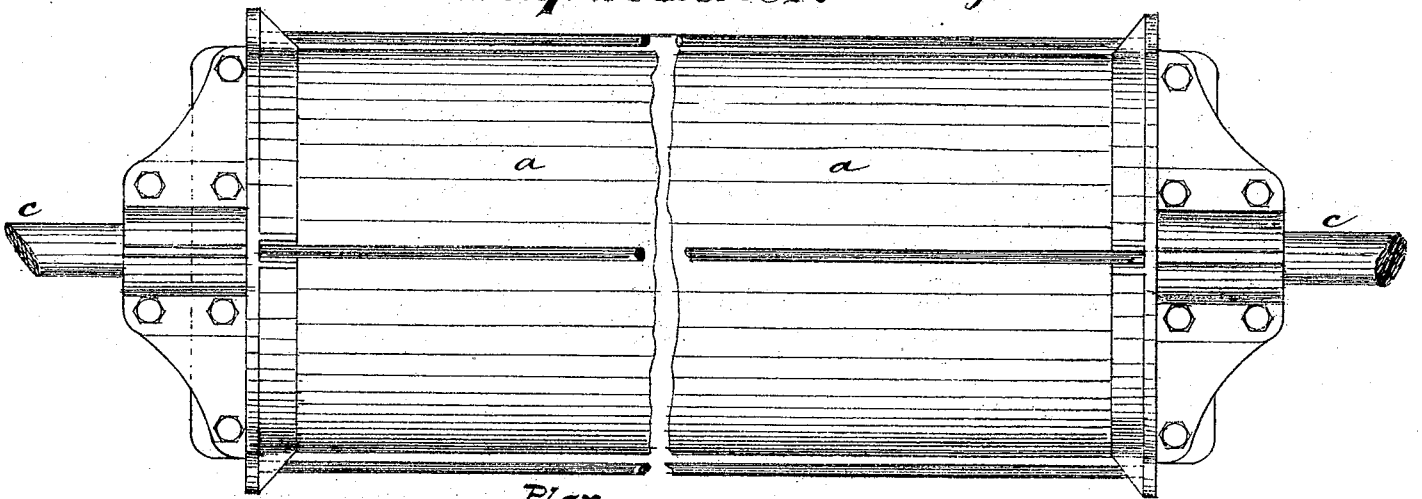
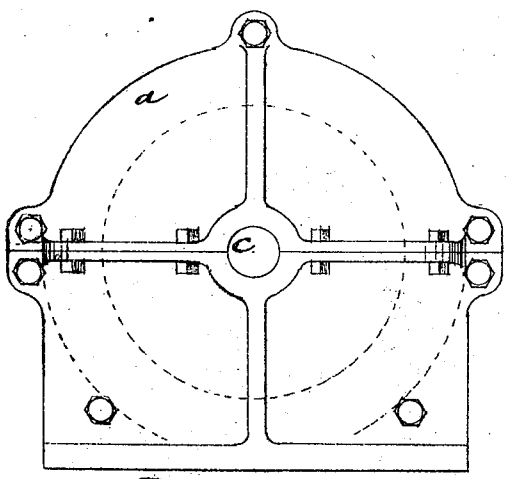
Fig: 2.



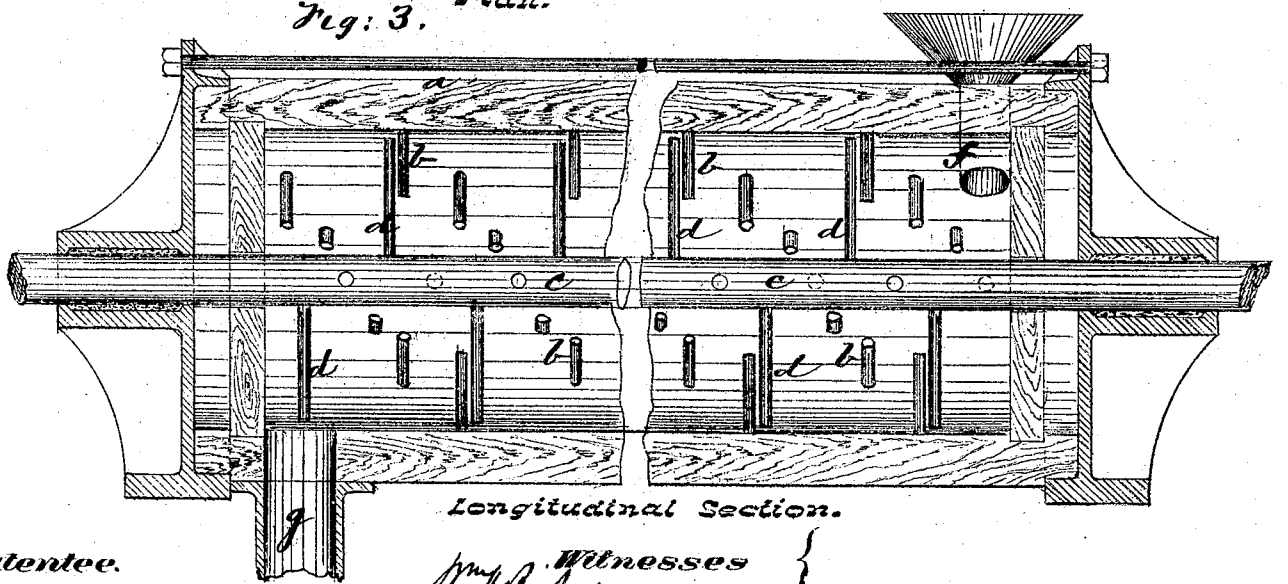

Plan.

Fig: 4.




End View.

Fig: 3.




Longitudinal Section.

Gustavus Ames } Patentee.

Witnesses {

Sheet. 3. 3 Sheets

# Gustavus Ames' Patent Pulp Refiner.

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Fig: 6.

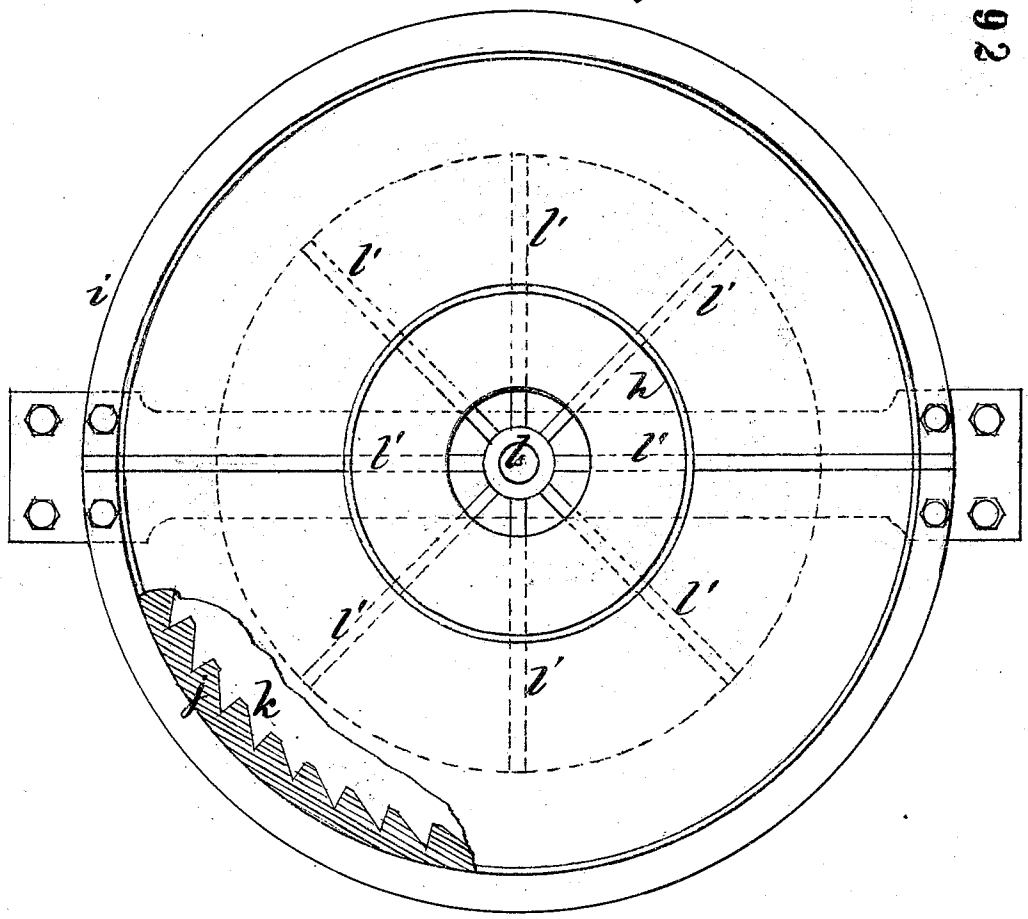
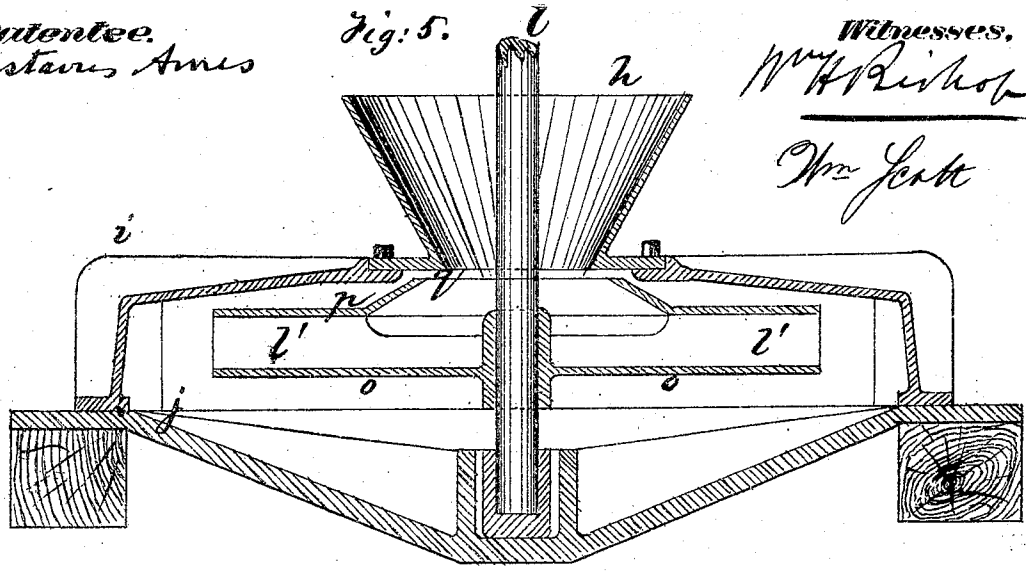



Fig: 5.




Patentee.
Gustavus Ames

Witnesses.
Wm H Richol
Wm Jerk

# UNITED STATES PATENT OFFICE.

GUSTAVUS AMES, OF NEW YORK, N. Y.

## IMPROVEMENT IN BEATING-ENGINES FOR PREPARATION OF PAPER-PULP.

Specification forming part of Letters Patent No. 118,092, dated August 15, 1871.

*To all whom it may concern:*

Be it known that I, GUSTAVUS AMES, of the city, county, and State of New York, have invented new and useful Improvements in Beating-Engines for the Preparation of Pulp to be used in the Manufacture of Paper; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is an elevation of my improved machine; Fig. 2 a plan, Fig. 3 a longitudinal section, and Fig. 4 an end view of the beating-cylinder; Fig. 5, a vertical section of the centrifugal or final beater; and Fig. 6, a plan thereof, with a part in section.

The same letters indicate like parts in all the figures.

My said invention is designed specially for the preparing of pulp made from the raspings of wood, although applicable to other substances. It is well-known that fibers obtained from the raspings of wood and other preparations of wood are short, and that when worked in the beating-engines usually employed for preparing pulp obtained from rags, the fibers are cut or otherwise too much reduced in length. The object of my said invention is to separate the fibers from each other and from particles of other matter found in wood, and thereby obtain the fine fibers without reducing their length.

In the accompanying drawing, *a* represents a horizontal hollow cylinder, armed on the inside with a series of pins, *b*, by preference round, arranged helically from the receiving to the discharging end. These pins converge toward the center of the cylinder, and in length I prefer to make them about one-quarter of the diameter of the inside of the cylinder. Within the cylindrical case there is a central shaft, *c*, the journals of which run in suitable boxes in the heads of the case, and provided with stuffing-box or other suitable means for preventing the free escape of water. This shaft is armed with radial pins *d*, like the pins *b* before described, except that I prefer to make them longer, and they are so placed as not to touch the pins *b* in their revolutions. The shaft *c* at one end has a pulley, *e*, to receive a belt from some suitable motor to drive the shaft at the rate of about two thousand revolutions per minute. At the receiving end the case is provided with a feeding-tube, *f*, through which the fiber and water are supplied, and at the opposite or delivery end it is provided with a pipe, *g*, which discharges the pulp into a hopper, *h*, of what I denominate the centrifugal finisher. The case *i* of the finisher is flat, and the ring *j* thereof circular, and its inner periphery serrated, as represented at *k*. In the center of this case there is a vertical shaft, *l*, driven by the shaft *c*, by means of beveled cogged wheels *m n*. Within the case the shaft *l* has eight radial wings, *l'*, more or less, which extend to within a short distance of the serrated periphery of the rim of the case. The wings are inclosed at the bottom by a disk, *o*, secured to the shaft, and at the top they are partially inclosed by a disk, *p*, which has a central eye, *q*, immediately under the hopper.

The machine being set in operation, the rasped wood or other fibrous matter to be pulped and water are fed into the hollow cylindrical case *a*, and as the shaft *b* is rotated at a high velocity, say two thousand revolutions per minute, the fibrous material and water are beaten by the round pins, which simply separate the fibers from each other and from other substances, but without cutting the fibers; and from the cylindrical case *a* the material passes through the discharge-pipe *g* into the hopper *h*, and thence through the eye *q* into the spaces between the wings *l'* and the two disks *o* and *p*, and by centrifugal action the fibers are thrown against the serrated periphery of the case, and thus finished to pulp suitable for use.

The pulp can be used as it comes from the case *a* without being subjected to the action of the centrifugal finisher; but I prefer to subject it to the combined action of the two.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the horizontal shaft armed with round pins, in combination with the surrounding case armed with round pins, and provided with a feeding-tube and a discharge-tube, so that the case can be kept full of water and fibers, substantially as and for the purpose specified.

2. In combination with the subject-matter of the first claim, the centrifugal finisher, substantially as and for the purpose set forth.

GUSTAVUS AMES.

Witnesses:
WM. H. BISHOP,
A. J. DE LACY.