

H. A. FRAMBACH.
Machine for Making Paper-Pulp from Wood.
No. 220,970. Patented Oct. 28, 1879.

Fig. 1.

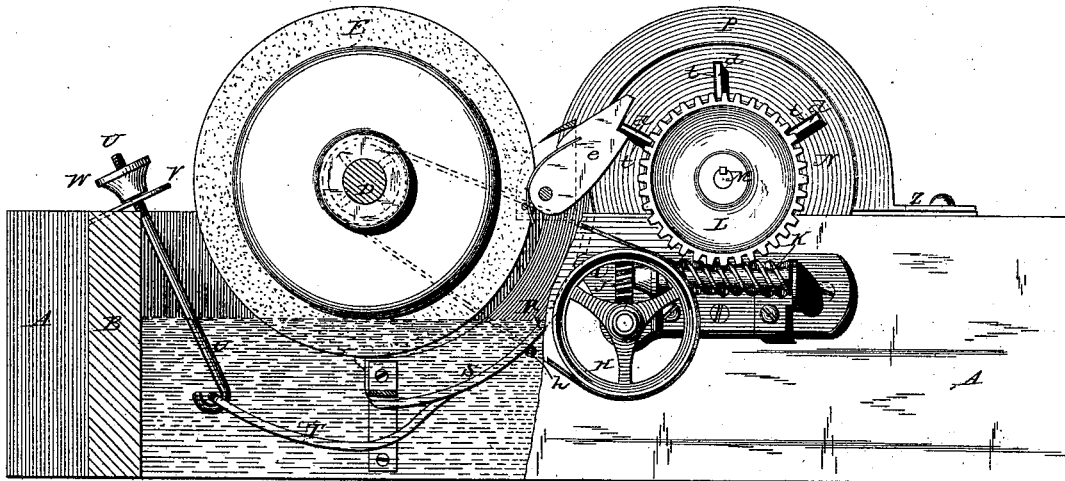
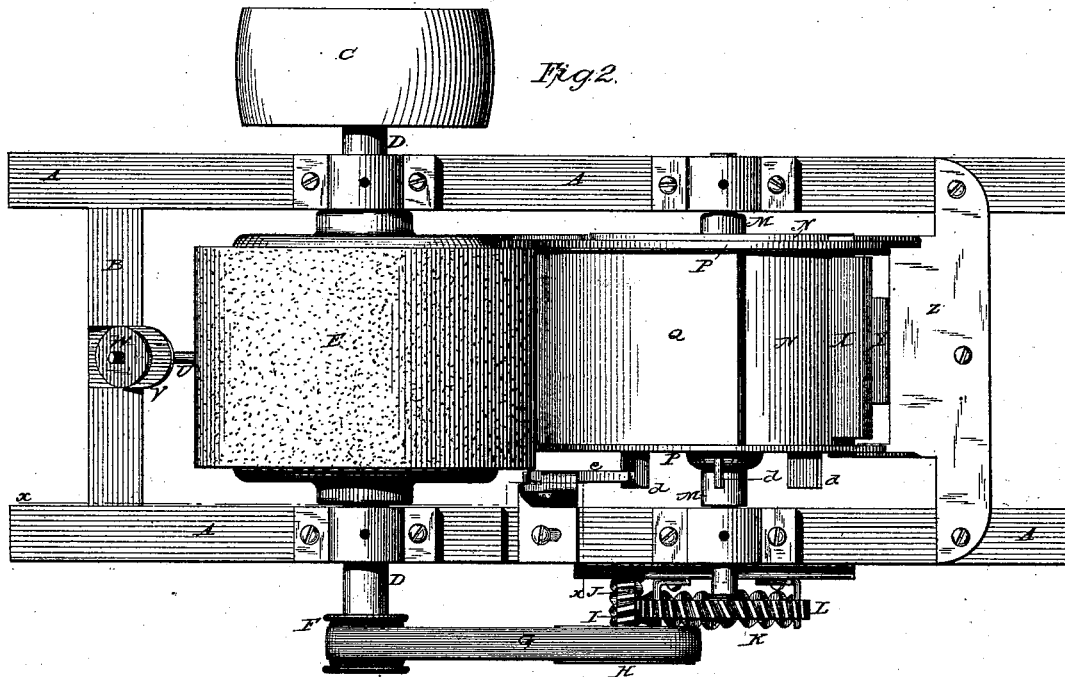


Fig. 2.

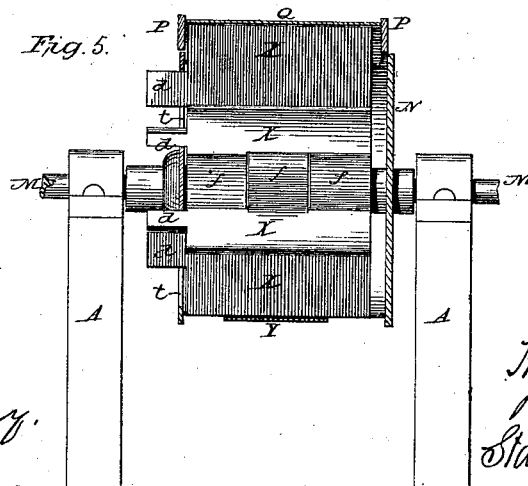
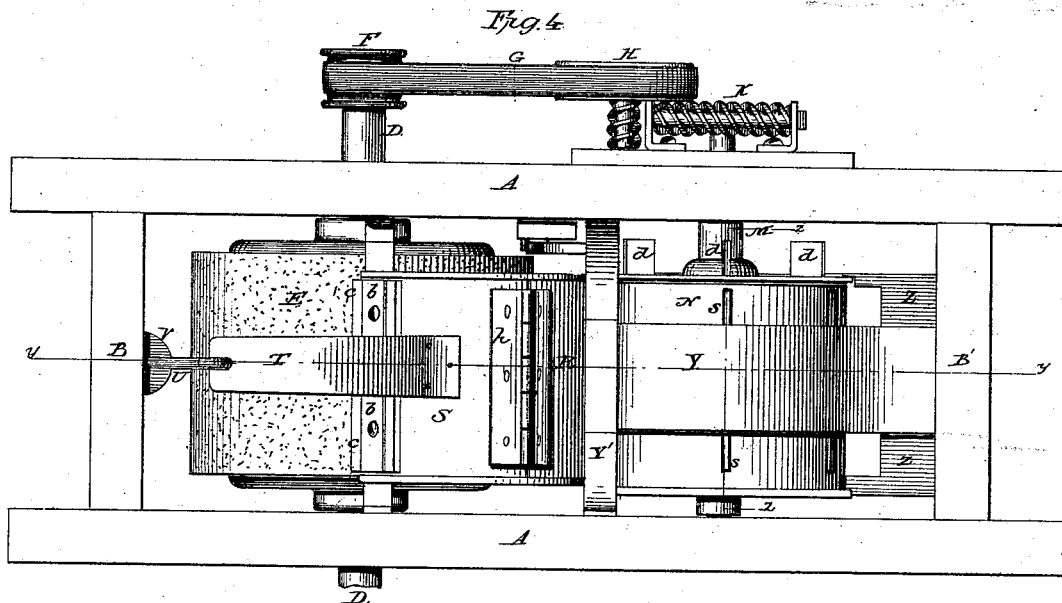
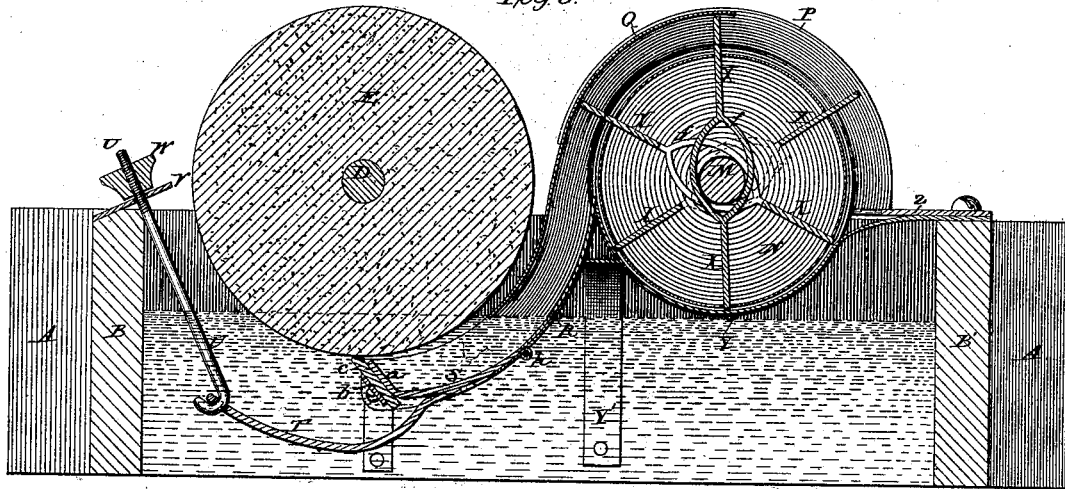


Witnesses.

Samy O. Hellingworth
J. H. Stansbury.

Inventor.
Henry A. Frambach,
By his Attorneys,
Stansbury & Munn

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Henry P. Hollingsworth.
J. M. Stanbury.

Inventor.
Henry A. Frambach
By his Attorneys,
Stanbury & Humm.

UNITED STATES PATENT OFFICE.

HENRY A. FRAMBACH, OF MENASHA, WISCONSIN.

IMPROVEMENT IN MACHINES FOR MAKING PAPER-PULP FROM WOOD.

Specification forming part of Letters Patent No. **220,970**, dated October 28, 1879; application filed October 2, 1879.

To all whom it may concern:

Be it known that I, HENRY A. FRAMBACH, of Menasha, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Machines for Making Paper-Pulp from Wood; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of the machine, part of the side frame having been cut away to show the parts within. Fig. 2 is a top view or plan. Fig. 3 is a longitudinal vertical central section. Fig. 4 is a bottom view. Fig. 5 is an end view, partly in section, showing the interior of the feeding-drum and the manner in which the cell-plates are placed upon the drum-shaft.

The same letter indicates the same part wherever it occurs in the drawings.

The nature of my invention consists in providing a machine for reducing wood to pulp with an automatic continuous feed, and delivering the wood to be pulped to the grinding or disintegrating wheel or abrading device beneath the surface of water, and in the special mechanisms adapted to these purposes.

The machine in which my invention is embodied is one in which the disintegration of the wood is effected by a grindstone, to which the wood to be operated upon is presented with the line of its fibers parallel to the shaft of the stone. The wood is divided into pieces about a foot long and two inches in diameter, and is fed into cells upon the periphery of a revolving feeding-drum, which carries it around and presents it to the action of the grindstone on its lower side and beneath the surface of the water in the tank in which the stone revolves.

The feeding mechanism is driven by a band-connection with the shaft of the reducing-stone, and the application of the wood to the stone, so as to control the degree and character of the abrading action, is subject to an adjusting mechanism, which bears the wood against the stone with the required amount of

force, however much or little wood may be contained in the cell or compartment which holds the material while the disintegration is going on. The cells which carry the wood around on the periphery of the feeding-drum are separated from each other by movable partitions, which are successively and automatically withdrawn below the surface of the drum as the cells, in succession, arrive at that point in their revolution where they are to deliver their charge into a chute, which carries it to the last cell, where it is to receive the reducing action of the stone, and pass into the tank in a state of minute division suitable for conversion into pulp.

To enable others to make and use my improved machine, I will proceed to describe more in detail its construction and operation, referring to the accompanying drawings, in which—

A marks the side framing of the machine, which, with the end framing, B B', and a suitable bottom, form the tank in which the stone revolves and afford support to the operative parts. C is a large pulley on the end of the main shaft D, to which the driving power is applied. This shaft, supported and turning in suitable boxes on the side frame, carries the large abrading-stone E, the lower segment of which is immersed in the water contained in the tank. On the opposite end of shaft D to that to which pulley C is affixed is a smaller pulley, F, which, by means of band G, gives motion to pulley H, on whose shaft is worm I, meshing into pinion J, whose shaft carries worm K, which drives gear L on the end of the shaft M of the feed-drum N, which thus receives a very slow motion from its connection with the rapidly-revolving shaft D of stone E, and one proportioned to the rate of revolution of that shaft.

The drum N is attached to its shaft by circular heads, and its surface is provided with slots s, through which the cell-plates X are projected and withdrawn. Each pair of these plates is formed of one piece of metal extending across the diameter of the drum, and provided with an oval loop, f, which embraces the shaft M in the manner shown in Figs. 3 and 5, so as to be capable of longitudinal movement in the line of the diameter of the

drum. The whole length of the plate is equal to the diameter of the drum plus the depth of the cell, so that when the plate on the feed side is forming the wall of a cell the companion plate is withdrawn to a level with the circumference of the drum on the opposite side.

The drum turns in a casing formed of the arches P P, the curved plate Q, and the lower concave plate, Y, the outer end of which, curved as shown in Figs. 3 and 4, passes up under the feed-plate Z, and is there attached to the frame. Its inner end is supported by the brace Y'.

The arched plates P P form the sides of the cells while they are carrying a charge of wood to the stone. The surface of the drum forms the bottom of the cells during part of their course, and the plate Q forms their top, and being extended downward, as shown in Fig. 3, forms also the top of the passage or chute down which the wood descends on its way to the last cell beneath the water in the tank and below the grindstone, where it is ground and reduced. The sides of this chute are formed by curved prolongations of the arched plates P P, and its bottom is formed by a concave formed of a fixed portion, R, and a hinged portion, S, hinged to R at *h*, (see Figs. 1, 3, and 4,) the latter of which is adjusted by arm T and screw-rod U, passing through plate V, and provided with the adjusting set-screw W. The hinged concave S forms the final receptacle, in which the wood is held while in the act of grinding. It is provided with a wooden lip, *c*, adjustably held between plates *a* and *b*, as shown in Fig. 3, which allows the concave to be drawn into close contact with the stone without injury to the latter.

The lip can be readily replaced when worn away by the abrasion of the stone.

The office of the concave Y is to support the lower ends of the cell-plates X and keep them projected through the upper slots of the drum N while confining the wood to the periphery of the drum, and allow them to be successively withdrawn as they reach the mouth of the chute where the wood is to pass from the drum to be conducted to the concave S.

The retraction of the plates at the proper moment to deliver the wood to the chute is effected by a spring-pawl, *e*, operating in conjunction with lugs *d* projecting laterally from the plates X through slots *s* in the feed-drum. As the drum revolves each of these lugs in

succession engages the pawl *e*, presses it down, and is by it gradually forced into the drum, its opposite end slowly riding upon the curved end of concave Y, and coming into position to form the lower wall of the first cell into which the wood is fed. The pawl *e* then springs back to its initial position, ready to engage with the succeeding lug.

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

1. In combination with a machine for reducing wood to pulp, an automatic continuous feed, whereby the wood prepared for reduction is carried upon a drum in cells or compartments, and delivered to the abrading or disintegrating mechanism below the surface of water, all substantially in the manner described.

2. The feeding-drum N, provided with slots *s s* and *t t* and sliding cell-plates X, having lugs *d*, in combination with spring-pawl *e* and concave Y, and mechanism for operating the drum, all as and for the purpose described.

3. In combination with the feeding-drum N, the casing P Q, and concaves R and S, forming the passage-way and chute along which the wood is carried to the reducing-wheel, all substantially as described.

4. In combination with the shaft D of the grinding-wheel, the pulley F, band G, pulley H, worm I, pinion J, worm K, gear L, shaft M, and drum N, all arranged and operating as and for the purpose set forth.

5. In combination with the hinged concave S, the removable wooden lip *c*, adjustably held between the plates *a b*, as and for the purpose specified.

6. In combination with the fixed concave R, the hinged and movable concave S, its arm T, adjusting-rod U, and set-screw W, all arranged and operating as and for the purpose stated.

7. In a wood-pulping machine, a feed-drum provided with sliding cell-plates, projected from and withdrawn into the drum at proper intervals to confine and release the wood on its way to the reducing mechanism by the described devices and in the manner specified.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

H. A. FRAMBACH.

Witnesses:

GEO. F. GRAHAM,
CHAS. F. STANSBURY.