

(No Model.)

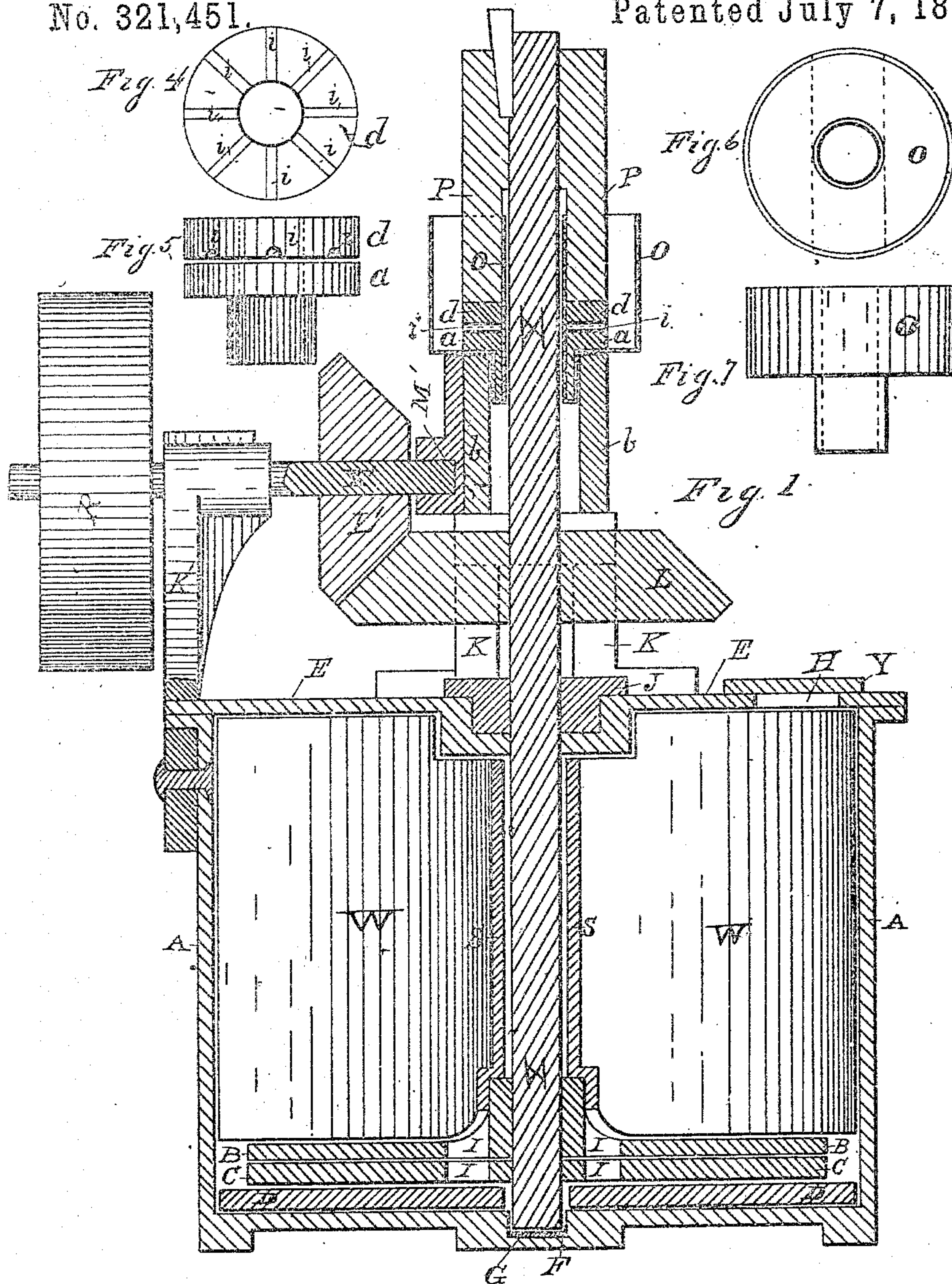
2 Sheets—Sheet 1.

G. H. POND

MACHINE FOR REDUCING WOOD AND OTHER FIBROUS MATERIALS
TO A PULP.

No. 321,451.

Patented July 7, 1885.



WITNESSES:

H. M. Pond.
G. H. Graham

INVENTOR

G. H. Pond

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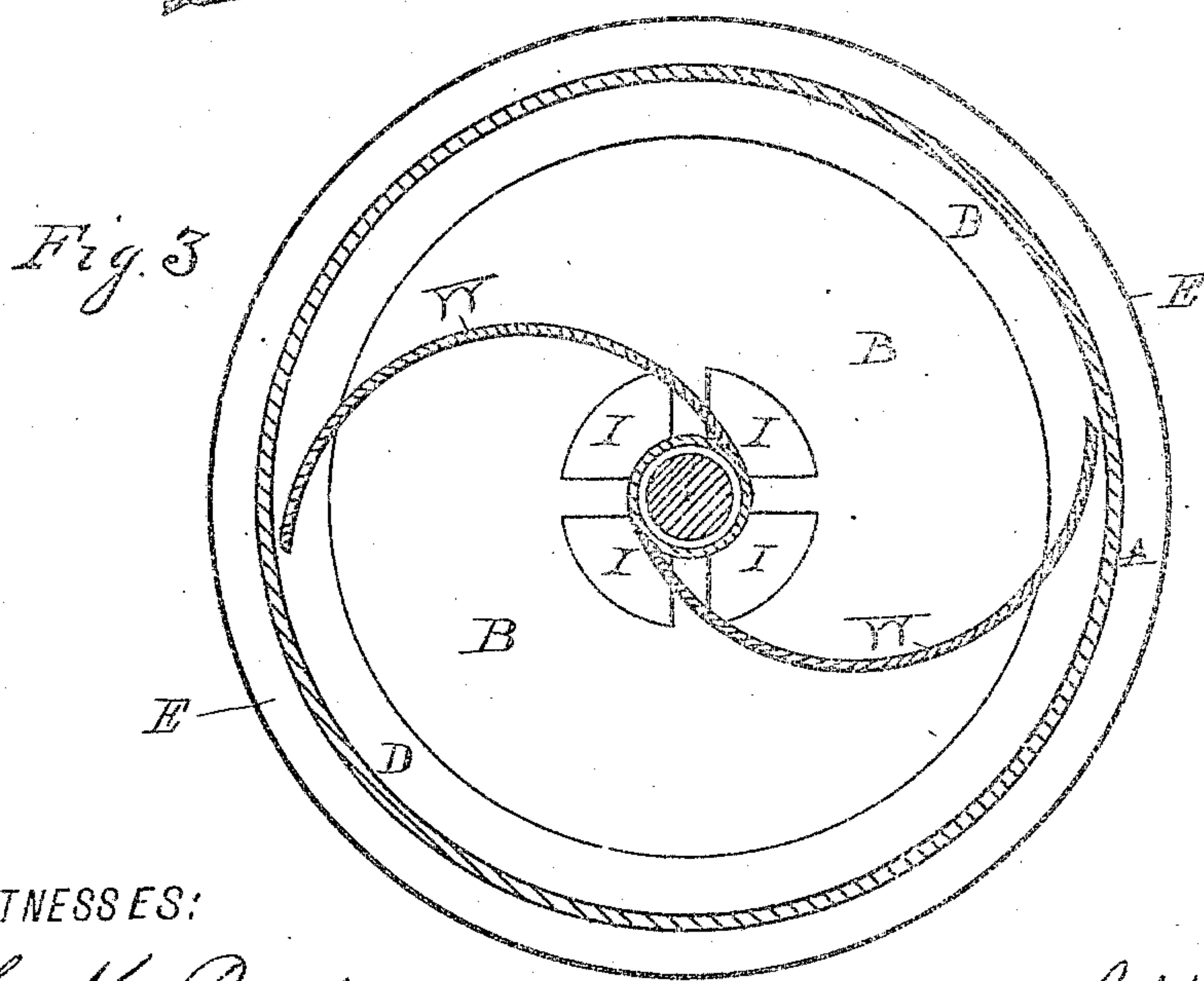
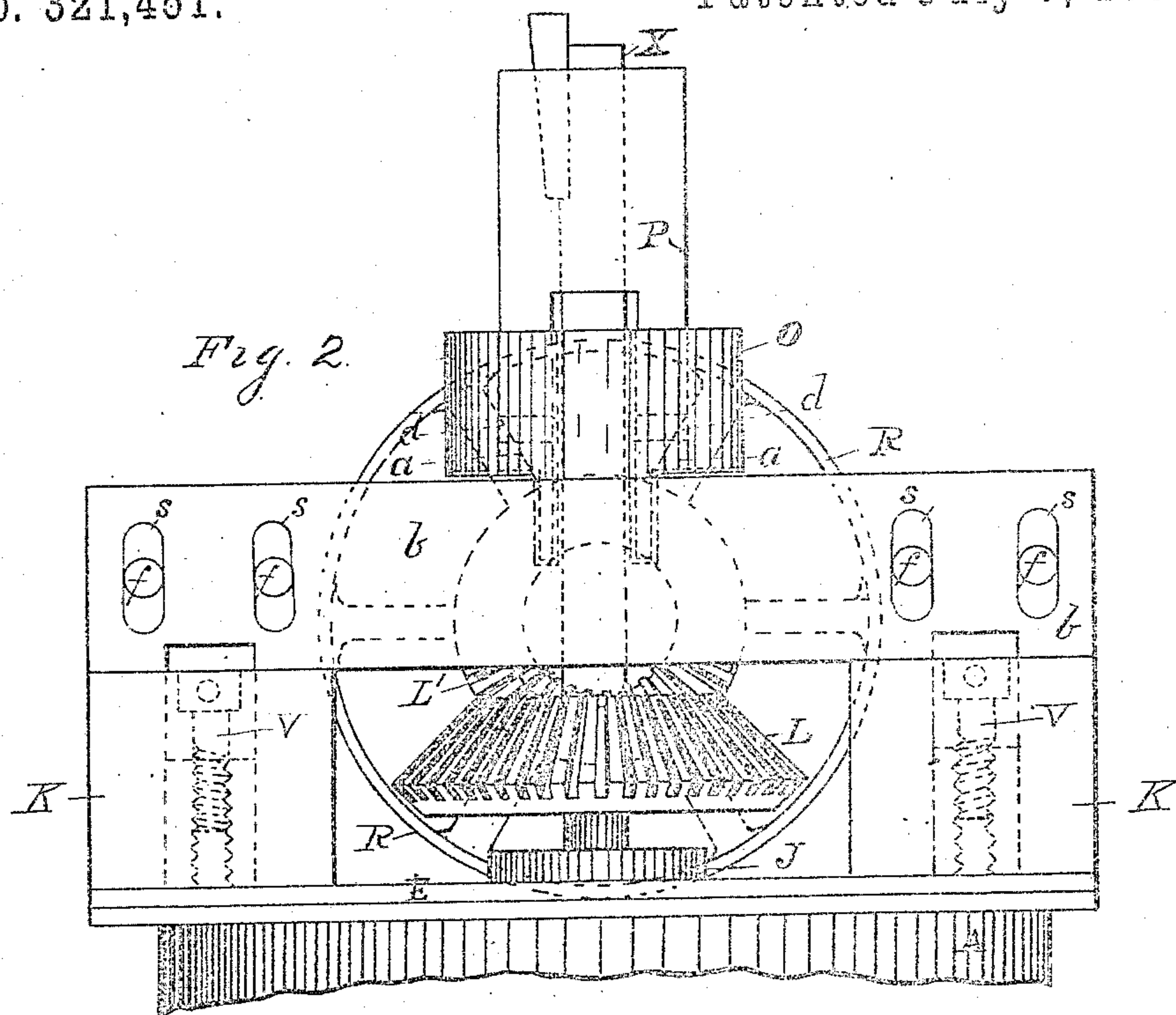
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UNITED STATES PATENT OFFICE.

GOLDSBURY HARDEN POND, OF GLEN'S FALLS, NEW YORK.

MACHINE FOR REDUCING WOOD AND OTHER FIBROUS MATERIAL TO A PULP.

SPECIFICATION forming part of Letters Patent No. 321,451, dated July 7, 1885.

Application filed August 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, GOLDSBURY HARDEN POND, a citizen of the United States, residing at Glen's Falls, New York, have invented certain new and useful Improvements in Making Pulp from Wood or other Fibrous Material, decreasing the expense of manufacture and the amount of power expended, and increasing its strength and fiber, thereby increasing its value; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Heretofore wood pulp has been made principally by grinding—a slow and expensive process—and also by the chemical process, which is still more expensive.

The object of my invention is to make a better fiber than has ever been made by grinding, and decrease the expense of the same, by gently rubbing and grinding it in an inclosed vessel, and a machine whose parts are easily adjusted, with its bearings outside the inclosed part of the cylinder within control of the operator.

In the accompanying drawings, Figure 1 represents a central vertical section of the machine. Fig. 2 is a plan view. Fig. 3 is a plan view of the interior of the cylinder. Figs. 4, 5, 6, and 7 are detail views of the upper bearing of the main shaft.

To carry my invention into effect I construct a cylinder, A, with cover E, all fitted steam-tight. Into this cylinder is placed a central shaft, X, on which is fastened the rubbing or grinding runner B B with shoes C. The bottom of the cylinder is fitted with dies D to receive the wear of the shoes, and on these faces the material is either rubbed or ground to any required fineness. The shaft is moved by pulley R and bevel gears L L. The shaft, with all the weight of the runners and other parts fastened thereto, rests and turns upon an overhanging bearing consisting of the runner P, fastened firmly to the shaft and turning with it, the whole resting and turning upon the bronze disk *d* and the bed-block *a*, these again resting upon the solid bridge formed by the wrought-iron bars *b b*. The bars are bolted through slotted holes *s s* to the stands K K. Under the bed-block, and inclosing the whole

step, is a copper pan, O, which holds the lubricant and is filled several inches above the wearing part of the step. The holes *i i* under the disk *d* allow the oil to flow in as fast as it is thrown out by the wearing-surfaces. The shaft and runner are raised or lowered by the screws V V, both ends at the same instant, thereby keeping the step level and in perfect line with the body of the machine. The recess F in the bottom is used for a guide to steady and keep in position the shaft and its hangings. The amount of grinding is regulated by the screws V V, which raise or lower the shaft and separate the grinding-surfaces, as required.

In using the machine I first fill the cylinder nearly full of water and fine pieces of wood or other fibrous material, (in fine pieces,) and then fasten down steam-tight the man-hole cover Y, and have the revolutions of the shaft and runner sufficient to work the mass in an hour. While it is being worked I let in the steam through a pipe in the bottom. The higher the pressure the better will be the results, giving a length of fiber according to the pressure of steam used. At eighty pounds it produces fair results; at a hundred and fifty it is much better, and at two hundred pounds pressure the pulp is very fine, giving a long soft fiber with but very little grinding. When the machine is set in motion, the mass of fine pieces of wood, with water, circulates rapidly by passing through the openings I I of the runner B B, then being forced outward and upward and around the inner side of the cylinder, when it comes in contact with the stationary wings W W, extending from the cylinder to the shaft, and is conducted to the central openings, I I, in the runner, whence it started, and is again lightly rubbed and thrown out, and so on, until the whole mass becomes a perfect pulp, all ready for the paper-makers. The amount of grinding is according to the pressure of steam used. At a low pressure considerable grinding is required to reduce the mass to a pulp; but with a high pressure but little grinding is required, as the pieces of wood are quickly softened by a high pressure of steam and the fibers separate from each other with but little rubbing, consequently not breaking the fibers as much as heavy grinding.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for reducing wood to a pulp, an air-tight vessel having arranged therein the adjustable rubbers whose shaft is mounted and suspended from a bearing arranged at its upper end.

2. In an apparatus for reducing wood to a pulp, an air-tight vessel having arranged therein the adjustable rubbers whose shaft is mounted and suspended from a bearing arranged near its upper end, the said bearing being carried upon the adjustable cross-bar *b*, substantially as described.

3. In an apparatus for reducing wood to a pulp, the air-tight vessel having the shaft carrying the grinders, in combination with the bearing by which the said shaft is supported, the same consisting of the runner *P*, keyed to the

shaft, and the adjustable bed-block *a*, substantially as described.

4. In an apparatus for reducing wood to a pulp, the air-tight vessel having the shaft carrying the grinders, in combination with the runner *P*, the circulating-wings, the disk *d*, having the grooves *i*, the bed-block *a*, and the inclosing oil-pan *O*, all substantially as described.

5. In an apparatus for reducing wood to a pulp, the air-tight vessel *A*, in combination with the shaft carrying the grinders, the circulating-wings of the stands *K K*, the bridge-bars *b b*, the screws *V V*, the bed-block *a*, and the head metal disk *d* with the runner *P*, and the oil-pan *O*, substantially as described.

GOLDSBURY HARDEN POND.

Witnesses:

H. M. POND,

G. H. GRAHAM.