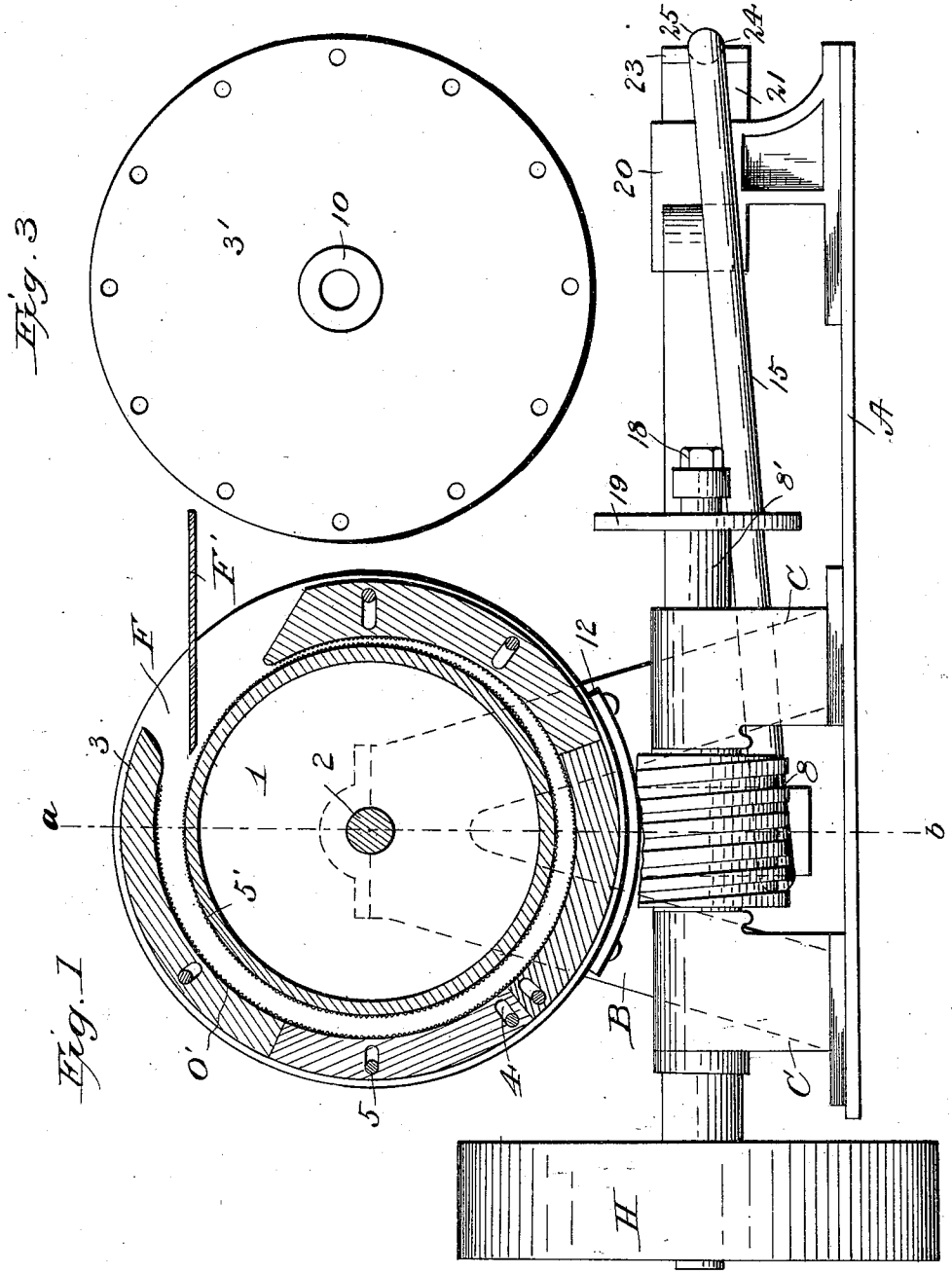
(No Model.) 3 Sheets—Sheet 1.

G. H. POND.

DISINTEGRATING MACHINE.

No. 591,494. Patented Oct. 12, 1897.



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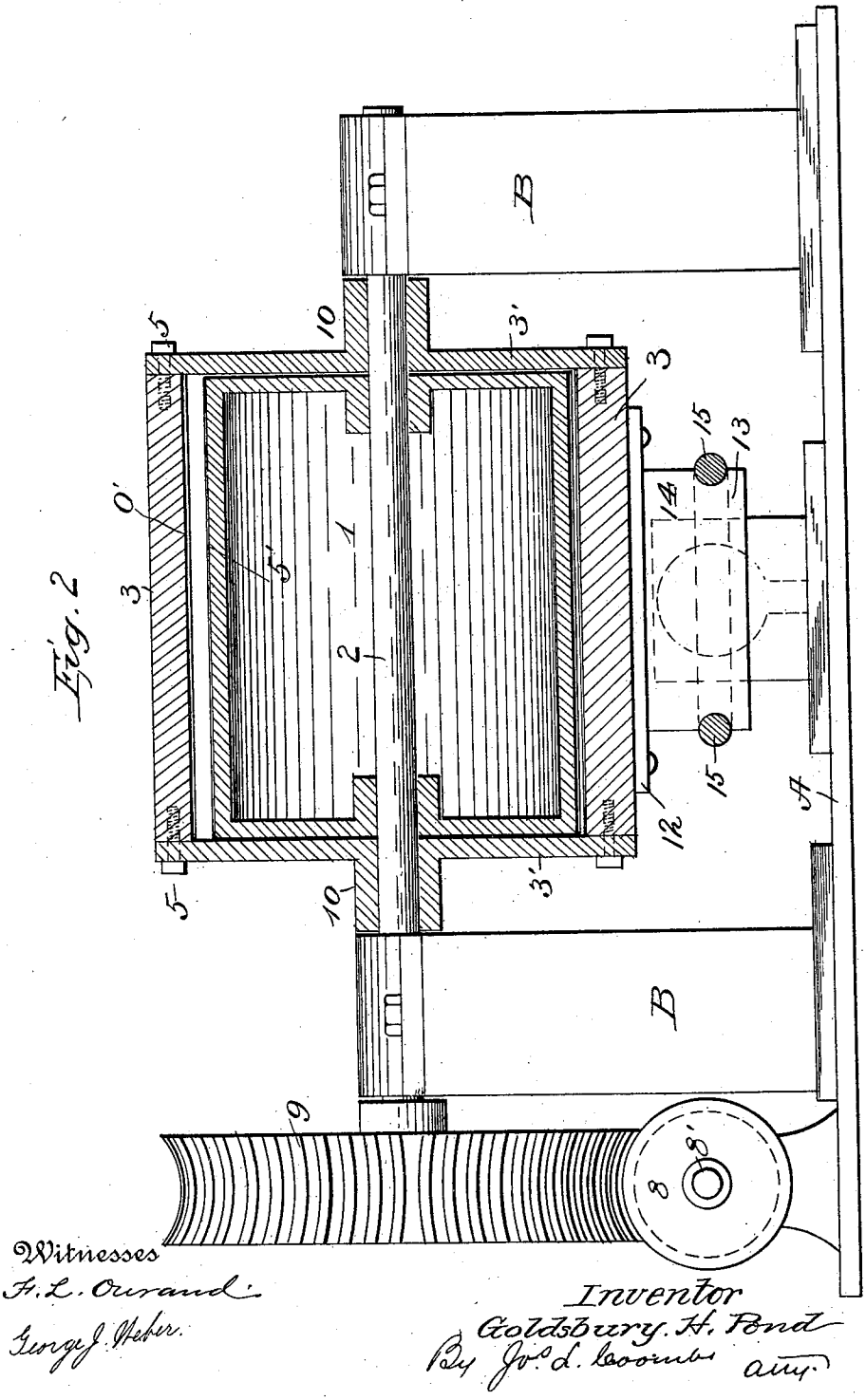


Fig. 2.

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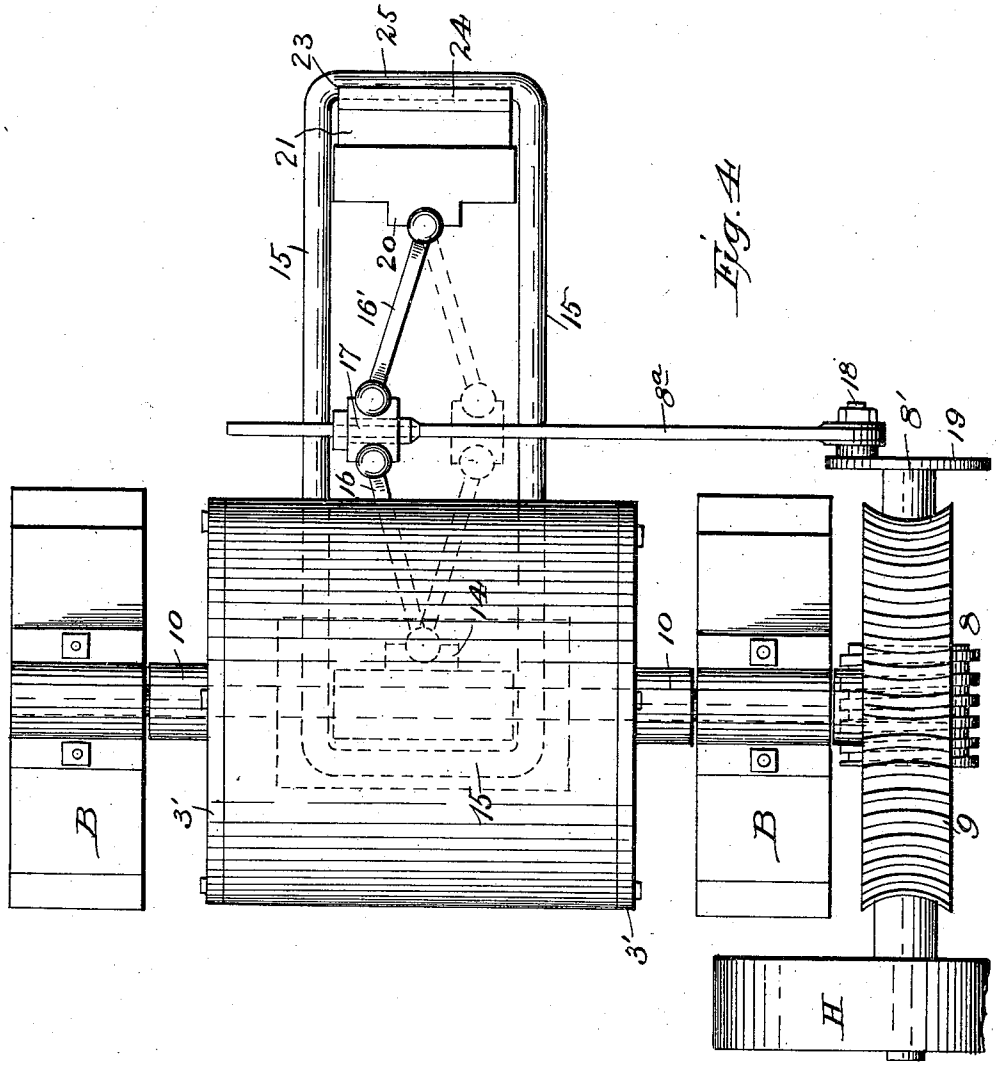


Fig. 4.

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UNITED STATES PATENT OFFICE.

GOLDSBURY HARDEN POND, OF ASHBURNHAM, MASSACHUSETTS.

DISINTEGRATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 591,494, dated October 12, 1897.

Application filed May 25, 1896. Serial No. 593,091. (No model.)

To all whom it may concern:

Be it known that I, GOLDSBURY HARDEN POND, a citizen of the United States, residing at Ashburnham, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Universal Disintegrating-Machines, of which the following is a specification.

My invention relates to improvements in machines for disintegrating straw and other fibrous materials for the manufacture of paper-pulp, although it may be employed for disintegrating or breaking up material for any purpose desired.

The object of the invention is to provide an improved machine for disintegrating fibrous material which shall disintegrate or tear apart the fibers in a rapid and efficient manner; and it consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is an end elevation, partly in section, of a disintegrating-machine constructed in accordance with my invention. Fig. 2 is a vertical sectional view on the line *a b*. Fig. 3 is an elevation of one of the heads or ends of the adjustable oscillating cylindrical casing. Fig. 4 is a plan view of the machine.

In the said drawings the reference-letter A designates the base of the machine, provided with two standards B or uprights provided with boxes at the upper ends, in which is journaled a horizontal rotatable shaft 2. Fixed upon said shaft so as to rotate therewith is a closed cylinder 1, having its outer surface roughened. At one end this shaft is provided with a cog-wheel 9, which meshes with a worm-pinion 8, fixed to a horizontal shaft 8′, journaled in pillow-blocks C, secured to the base A. At one end this shaft 8′ is provided with a pulley H, by which it is rotated.

Surrounding said cylinder 1 and eccentric thereto is a casing consisting of a number of adjustable segments 3, roughened on their inner sides, formed with a number of radial slots 4, with which engage a number of screw-bolts 5, passing through apertures in the circular heads 3′. There is an opening F between two of said segments for the feed and discharge of the material. The said heads 3′ are provided with bosses 10, which are loosely journaled on the shaft 2, so as to vibrate or oscillate thereon.

Secured to the lower side of said casing is a curved plate 12, provided with a depending lug 14, formed with a groove 13. The numeral 15 designates a horizontal rectangular frame or yoke, the inner transverse end of which engages with said groove. The numerals 16 16′ designate two toggle-levers connected by ball-and-socket joints with a block 17, secured to a crank-shaft 8^2, connected with a wrist-pin 18 of a disk 19 on the end of shaft 8′ opposite the pulley H. The other end of lever 16 is connected with the lug 14 by a ball-and-socket joint, while the outer end of lever 16′ is connected by a similar joint with a block 20, resting on the base A. The numeral 21 designates a rubber or other elastic spring or buffer interposed between the outer side of the block 20 and the inner side of a plate 23, provided with a groove 24, (see dotted lines, Figs. 1 and 4,) with which the outer transverse end 25 of the frame 15 engages. The object of this spring is to compensate for any lost motion during the operation of the toggle-levers.

The operation is as follows: The segments of the cylindrical casing are adjusted with respect to the cylinder 1, so as to form a tapering or graded space around it. The machine is set in motion, and the fibrous material to be disintegrated is fed into the opening F from a platform F′, when it is engaged by the roughened moving surfaces of both the cylinder and the casing and formed into rolls. These rolls are carried along in the graded space between the cylinder and casing, and as the space grows smaller the rolls are made smaller by squeezing between the two surfaces and are further rolled, but soon are torn apart by the vibrating or oscillating motion of the casing, in conjunction with the direct motion of the cylinder, and made into smaller and smaller rolls and again torn apart, and so on continuously as long as the fibrous material is fed to the machine, the combined action of the rolling, squeezing, and tearing completely and perfectly disintegrating the material, discharging it in a very finely-divided state, the fibers thereof being in a condition for making into paper.

By adjusting the segments with respect to

the cylinder the disintegration of the material may be effected by breaking, grinding, rolling, tearing, squeezing, or rubbing, as the case may be.

By setting or adjusting the casing on a circle concentric with the cylinder the machine will simply rub the material. By setting it concentric part way and eccentric the rest, with a graded or tapering space between it and the cylinder, the machine will rub, break, and grind.

Having thus fully described my invention, what I claim is—

1. In a disintegrating-machine, the combination with the rotatable cylinder having a roughened surface, and the vibrating casing surrounding the same, having a roughened eccentric and adjustable surface, of means for vibrating and rotating said casing and cylinder, substantially as described.

2. In a disintegrating-machine, the combination with the rotatable cylinder and means for rotating the same and said cylinder formed with a roughened surface, of the vibrating casing surrounding said rotating cylinder consisting of the end heads, the adjustable and eccentric segments having roughened surfaces and formed with slots in the ends, the screws passing through said heads and ends for adjusting the segment to and from the rotating cylinder, and means for actuating the vibrating casing, substantially as described.

3. In a disintegrating-machine, the combination with the roughened cylinder, the rotatable shaft, the worm-wheel, the pinion meshing therewith and the shaft to which said pinion is secured, of the adjustable cylindrical casing having a roughened inner surface, the end heads secured thereto, journaled on said cylinder-shaft, the grooved depending lug, the rectangular frame engaging therewith, the block, the toggle-levers, the crank-shaft and block and the wrist-pin and disk, substantially as described.

4. In a disintegrating-machine, the combination with the roughened cylinder, the rotatable shaft, the worm-wheel, the pinion meshing therewith and the shaft to which said pinion is secured, of the cylindrical casing having a roughened inner surface, the end heads secured thereto journaled on the cylinder-shaft, the grooved depending lug, the rectangular frame engaging therewith, the block, the grooved plate, the spring-buffer, the toggle-levers connected with said lug and slide by ball-and-socket joints, the crank-lever, the block thereon with which said levers are also connected by ball-and-socket joints, the wrist-pin and the crank, substantially as described.

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