

S. M. ALLEN.
Grinding Cylinder for Reducing Wood to Pulp.

No. 223,304.

Patented Jan. 6, 1880.

Fig. 1.

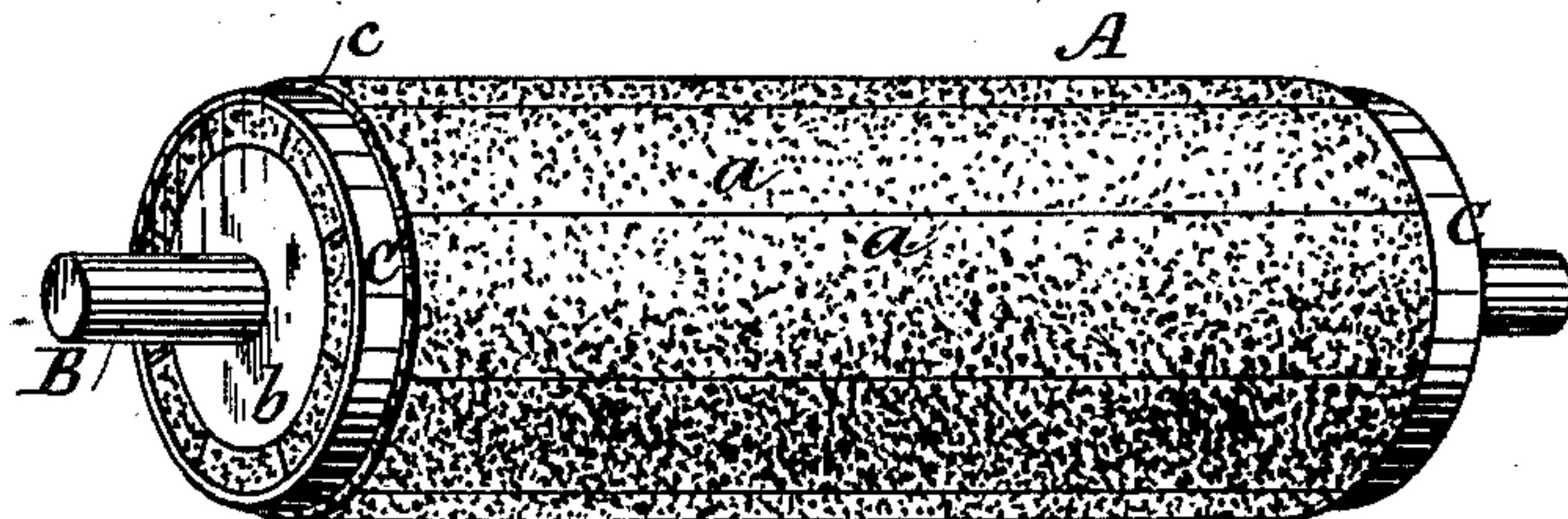


Fig. 2.

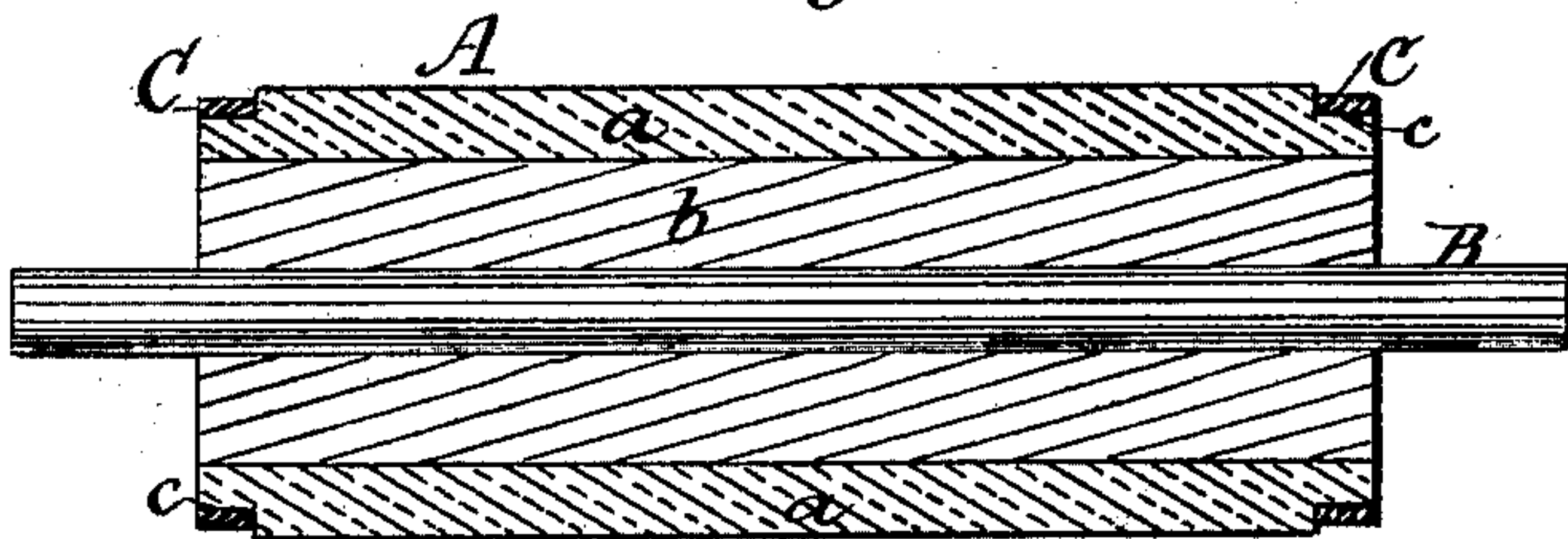
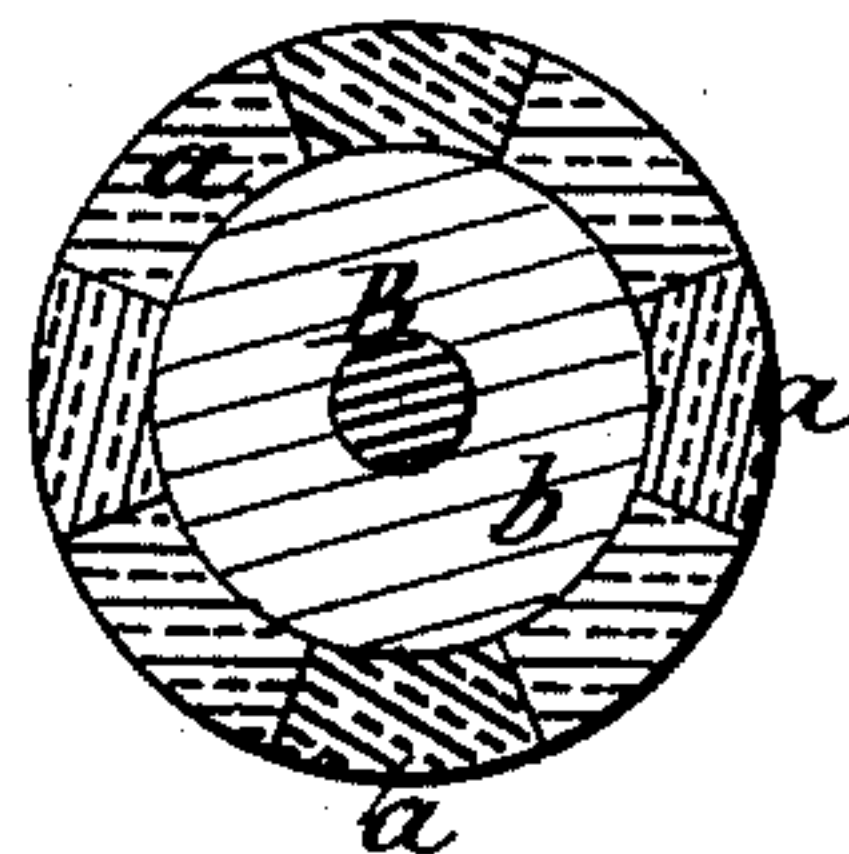


Fig. 3.



Witnesses:
E. E. Masson
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by A. Pollok
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UNITED STATES PATENT OFFICE.

STEPHEN M. ALLEN, OF DUXBURY, MASSACHUSETTS.

GRINDING-CYLINDER FOR REDUCING WOOD TO PULP.

SPECIFICATION forming part of Letters Patent No. 223,304, dated January 6, 1880.

Application filed December 11, 1879.

To all whom it may concern :

Be it known that I, STEPHEN M. ALLEN, of Duxbury, Massachusetts, have invented a new and useful Improvement in Grinding-Cylinders for Reducing Wood to Pulp, which invention is fully set forth in the following specification.

In the manufacture of paper-pulp I have found that for the purpose of crushing, disintegrating, and grinding wood and other fibers rollers or grinders of emery or other artificial stone are better adapted than those made of ordinary stone or metal. In making such rollers or grinders of emery or artificial stone great difficulty has been encountered in consolidating so large a body of granulated stone, flint, or emery when mixed with proper cement, and when made they are apt to be unequally united, so as to wear unequally and to burst or break away in use. In order to overcome these difficulties and to construct a wood-grinder which should be homogeneous, yet of sufficient size, and which should be efficient and safe in operation, I devised the grinder for which Letters Patent No. 221,993, dated November 25, 1879, were granted to me, in which the grinding-cylinder was formed of a number of sections, which were tamped and finished separately, and then confined upon an axle. These sections were in the form of thin disks, which were perforated, and a sufficient number of them were secured together to form a cylinder of the desired length.

In the present invention the grinding-cylinder, or the grinding-face of the cylinder, is formed in sections which extend longitudinally of the cylinder, being in the form of logs or staves, instead of disks. These logs or staves are of artificial stone, and are confined in a proper manner by hoops, bolts, set-screws, clamps, dovetail grooves, or any ordinary or suitable means, upon the surface of a solid or open cylinder, so as to form a proper grinding-surface. The logs or staves may form a single layer around the cylinder, or they may be in several layers. Their shape may be varied more or less; but they should be thin enough in one direction to be thoroughly tamped and consolidated, and of sufficient depth, when secured in position on the cylinder, to withstand centrifugal action and the pressure of the wood

against their surface. They may be simply placed side by side around the cylinder, or connected with each other by tongue-and-joint or other connection. It is not essential that a cylinder be placed within the sections. They may be secured around the axle, or the interior mounting may be prismatic.

The following description will enable those skilled in the art to which is appertains to make and use my invention.

Crushed or granulated emery, corundum, quartz, flint, or any hard stone is formed into a paste or mortar by the use of the proper cementing liquid or paste, which, being well known, need not be described, and the mass is brought to the proper consistency for molding, tamping, or compressing. The paste or mortar is then cast or compressed in a proper mold for the purpose, of different sizes and thickness, as the case may require, into staves or logs, after which it is consolidated under great pressure. When formed, the logs or staves are dried, and usually soaked in some water-proof liquid. The same are then fully dried and seasoned for use. These logs or staves are confined on the surface of a roll or open-pulley cylinder, forming, when thus placed in position, a perfect cylinder of the proper size, usually from twelve to thirty-six inches in length; but it may be of such length or size as may be required.

In the accompanying drawings, which form a part of this specification, is shown a grinder constructed in accordance with this invention, Figure 1 being a perspective view, Fig. 2 a longitudinal section, and Fig. 3 a cross-section.

A is the cylinder, composed of the logs or staves *a* and core *b*, through the center of which the shaft B passes.

A hoop, C, ordinarily of iron, fits over the ends of the logs or staves and secures them in position. In order that the hoop may not project beyond the surface of the grinder, the ends of the staves or logs are recessed or shouldered, as shown at *c*.

The surface of the cylinder A may be plane, corrugated, or of any desired or suitable form.

In using the grinder it may be employed in any ordinary or suitable way. For example, two cylinders, with their surfaces of the proper configuration, constructed in the manner al-

ready described, may be revolved and the wood presented thereto, as described in Letters Patent heretofore granted to me and dated March 12, 1878.

5 The new grinder may be employed in other machines and processes, and when two are employed they may be revolved in the same or in opposite directions, and the wood be presented thereto endwise, diagonally, or side-
10 wise, or as preferred. The grinder, instead of being a true cylinder, may be a cone or other solid of revolution, the proper form depending on the use to which it is to be put.

The logs or staves need not be all of the
15 same size, but some may be larger than others.

I do not, therefore, confine myself to the means described for securing the logs or staves in position, nor to the particular form and dimensions of the same or of the grinder, nor
20 to any method of grinding wood or other fiber by means of said grinder.

Having thus fully described my said invention and the manner in which the same is or may be carried into effect, what I claim, and
25 desire to secure by Letters Patent, is—

1. A cylinder or grinder of artificial stone, emery, or corundum, for grinding and disintegrating wood and other fiber, having the grinding-surface composed of distinct longitudinal sections, logs, or staves, arranged and
30 held together substantially as described.

2. The combination, with a number of logs or staves of artificial stone, emery, or corundum, of a shaft or arbor and means for confining the said logs or staves thereon, sub-
35 stantially as described.

3. The combination, with a solid or open cylinder, of a number of logs or staves of artificial grinding material arranged longitudi-
40 nally on the said cylinder, and hoops or equivalent means for confining said logs or staves, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

STEPHEN M. ALLEN.

Witnesses:

THOMAS M. GRIDLEY,
GEO. A. SAVAGE.