

(No Model.)

S. M. ALLEN.

Wood Grinder for Making Paper Pulp

No. 232,431.

Patented Sept. 21, 1880.

Fig. 1

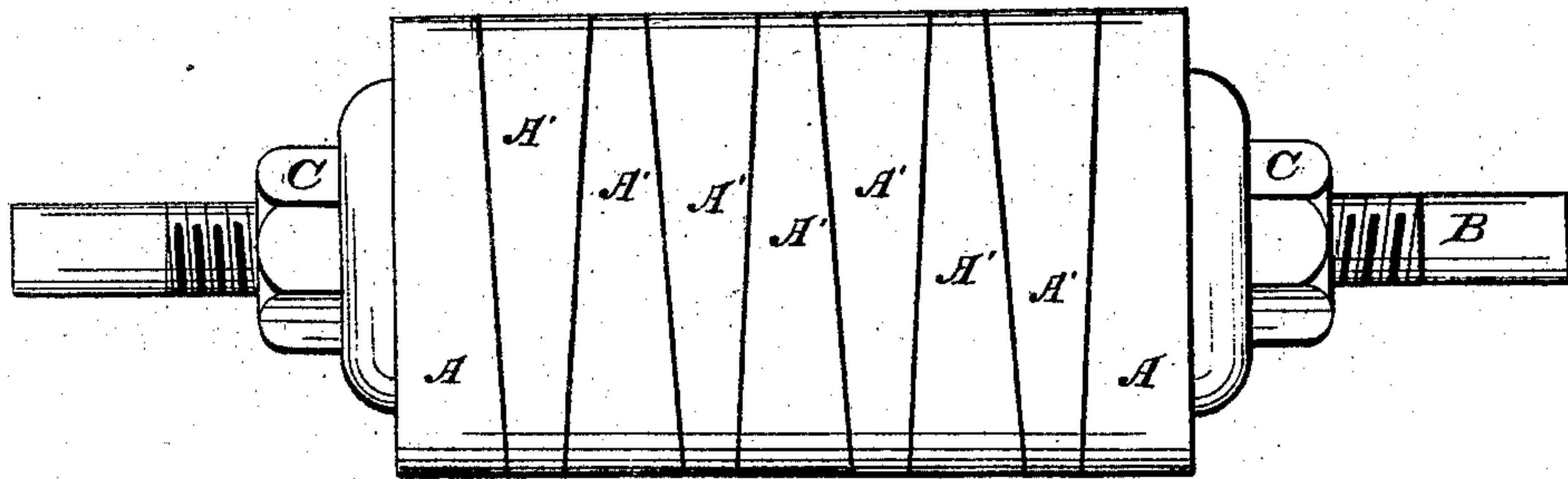


Fig. 2

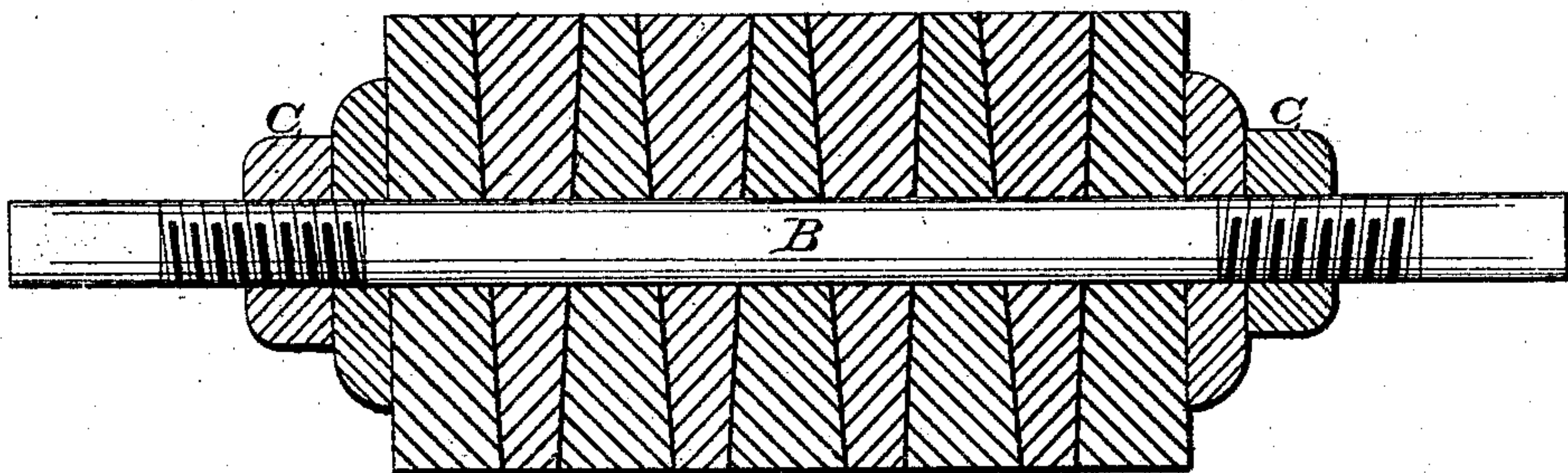
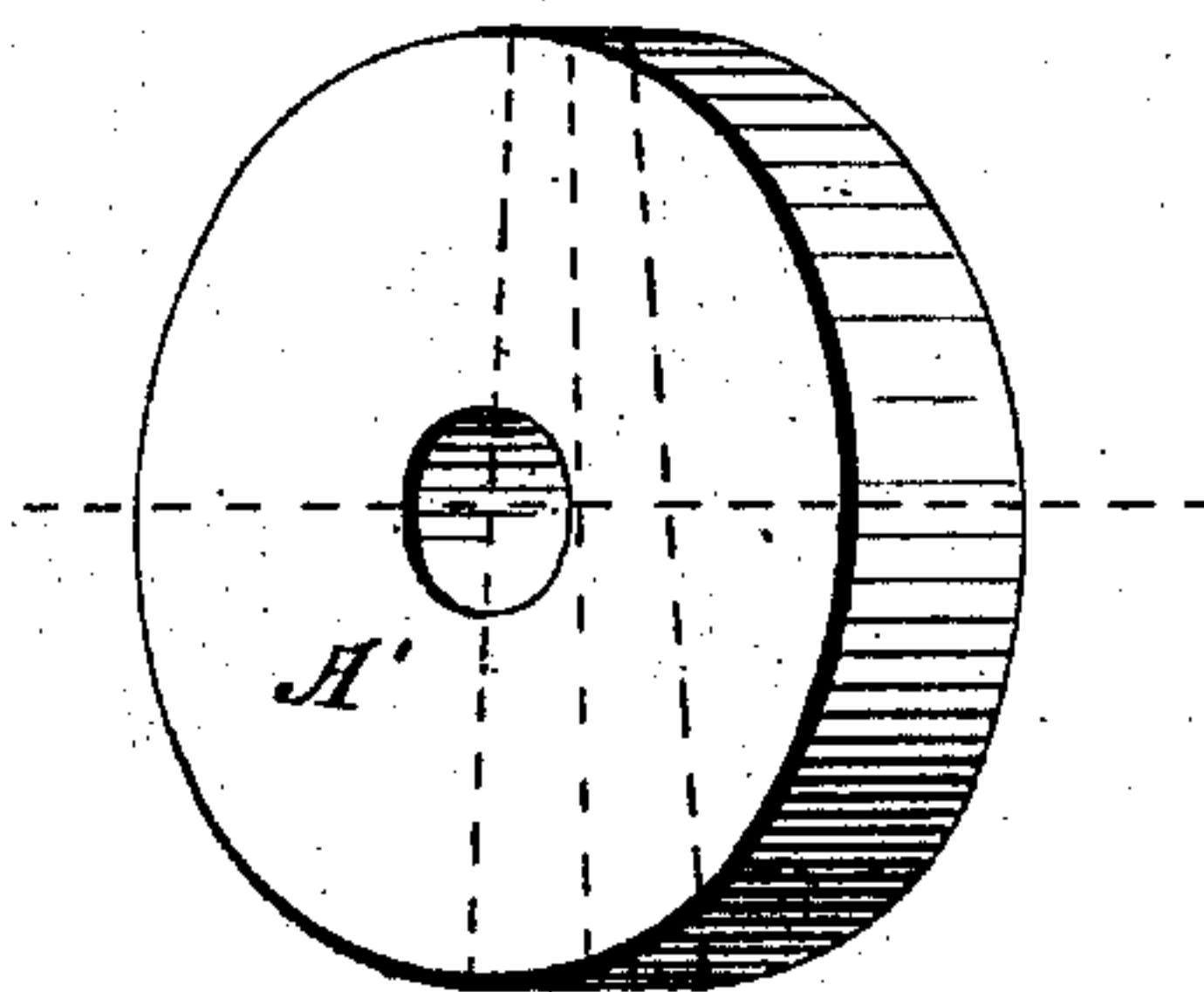


Fig. 3



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STEPHEN M. ALLEN, OF DUXBURY, MASSACHUSETTS.

WOOD-GRINDER FOR MAKING PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 232,431, dated September 21, 1880.

Application filed March 18, 1880. (No model.)

To all whom it may concern:

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

This invention relates to artificial-stone or emery grinders for reducing wood or other fiber to pulp for paper-making or other purpose, in which the abrading or grinding surface of the whole body of the grinder is formed in sections, which are separately molded and compressed and then united; and the present invention has reference more particularly to the grinders formed of a series of comparatively thin disks confined upon a suitable shaft, as shown in my Patent No. 221,993, dated November 25, 1879.

The invention consists in the construction of the disks constituting the sections of a cylindrical or conical grinder, so that their lines of junction do not extend directly around the grinder in a plane perpendicular to the axis of the grinder, but are broken by the overlapping of adjacent disks. This is best effected by making the lines run obliquely or diagonally with reference to such plane.

In using a cylinder or grinder in which the junctions between the sections extend directly around the same, wood becomes creased or furrowed, so as to leave projections corresponding to the joints between the disks, which projections are broken off unground, and, going with the pulp as little lumps, interfere with the subsequent operations. This objection is completely overcome by my present invention. The disks are so formed that when secured together they break joints, and the seams are spiral. The wood is in this way ground off evenly, and there are no projecting ridges. From the shape of the disks, also, they are pressed more firmly together and bind each other, so that they cannot turn one against the other.

The following description will enable those skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 is a side elevation of a grinder con-

structed in accordance with said invention; Fig. 2, a longitudinal section, and Fig. 3 a perspective view, of one of the disks detached.

The grinder, as shown, is composed of end sections or disks, A, and intermediate sections or disks, A', supported upon a shaft, D, and clamped together by nuts C. The shape which is or may be adopted is clearly shown in the drawings. Each disk, instead of being of equal thickness throughout, has its flat sides inclined toward each other, so that the face gradually diminishes from its widest portion in either direction to the opposite point, where it is narrowest. The inclination of the flat sides in the intermediate sections toward the central plane is preferably the same for both. The end pieces, A, have only one of their flat sides inclined, the other being perpendicular to the axis. The disks may be of different sizes, but are usually from four to six inches in thickness. The thickness should not be greater than can be thoroughly compacted.

The material is prepared by mixing crushed and granulated emery, corundum, quartz, flint, or other hard stone with a suitable cementing liquid or paste to the consistency required for molding, and is then cast and compressed in molds of suitable size and shape. The rollers or disks are partially dried and usually water-proofed, and then dried and turned off. The disks or sections are then placed in position on a shaft or mandrel, B, on which they are secured and clamped by the nuts C or by other suitable means.

The operation of a grinding-wheel, such as shown, will be readily understood. The wood is presented sidewise, endwise, or in any other position, and the fibers are ground off by the abrading surface. Since the line of junction of the disks extends diagonally in short spirals around the cylinder there is no possibility of grinding grooves in the wood; but if the fiber is not removed at a point opposite any of the dividing-lines between the sections it is immediately removed by contact with the succeeding abrading surface projecting beyond said point on the one side or the other.

Different forms may be given to the section-disks—such, for example, as obtained by passing a number of planes through a cylinder in directions oblique to the axis. It is not nec-

essary, however, that the disks should be of such forms, since their sides need not be flat, the essential features being, first, that the portions of adjacent disks overlap, so as to break joints, and, secondly, as the best form of said arrangement, that the edges are oblique, whether in the same direction or in different directions—for example, zigzag—to the plane perpendicular to the axis of the cylinder or grinder. It is not necessary that the disks be of unequal thickness. Their opposite sides may be parallel. It is preferred, however, that the sections or disks should be as nearly as possible uniform, and that they should be, as it were, wedge-shaped, with flat sides, substantially as shown. The number of disks may be even or odd, and is regulated by the length of the cylinder required.

Having now described my said invention and the manner in which the same is or may be carried into effect, I desire it to be clearly understood that I do not limit the invention to the particular construction of the disks indicated in order to effect the desired oblique direction of lines of junction, and also that I do not claim herein the construction of a grinder comprising disk-sections, with their edges bounded by lines oblique to the axis of

the cylinder, so that the oblique junction-lines are not parallel, but extend toward opposite ends of the cylinder, although such a construction is shown in the drawings, nor the use of interlocking projections on the contiguous ends of the disk-sections, although this is suggested by the statement that the junctions between the sections may be zigzag, since these special constructions are made subject-matter of a separate application for Letters Patent; but

What I do claim, and desire to secure, is—

1. A grinder composed of disk-sections overlapping at the edges, so as to break joints, substantially as described.

2. A grinder of artificial stone, emery, or corundum, composed of sections or disks, as described, secured upon a shaft, so that the lines of junction between said sections or disks around said grinder are oblique to planes perpendicular to the axis, substantially as set forth.

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

Witnesses: STEPHEN M. ALLEN.

WALTER JONES,

GEO. A. SAVAGE.