

(No Model.)

F. A. CUSHMAN.

WOOD PULP GRINDER.

No. 304,182.

Patented Aug. 26, 1884.

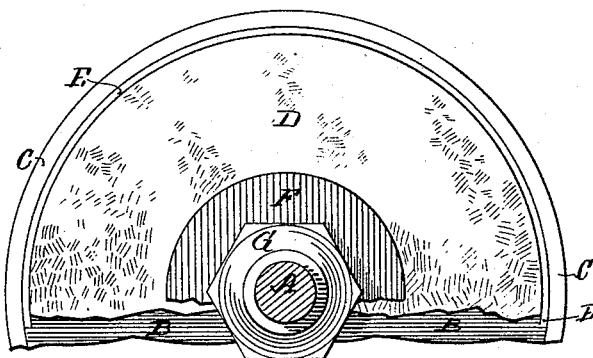


Fig. 1.

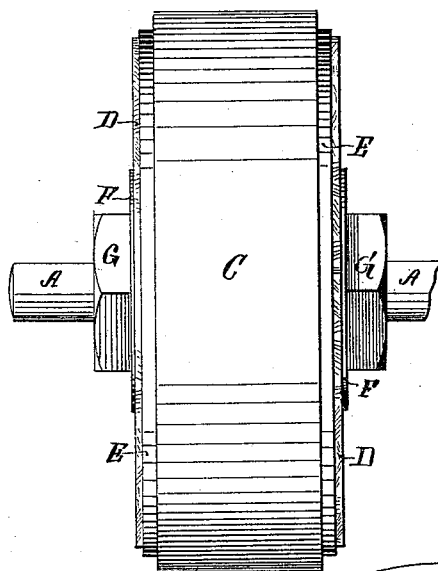


Fig. 2.

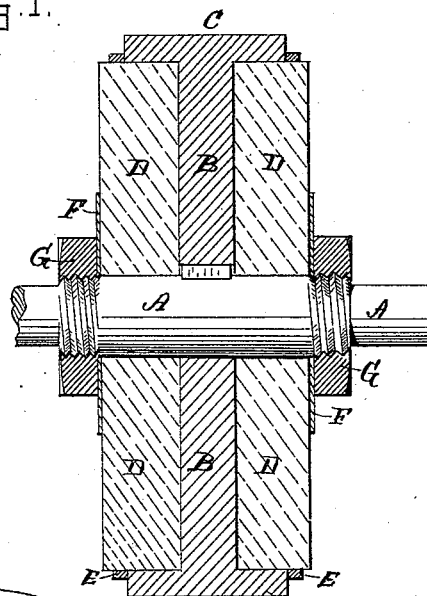


Fig. 3.

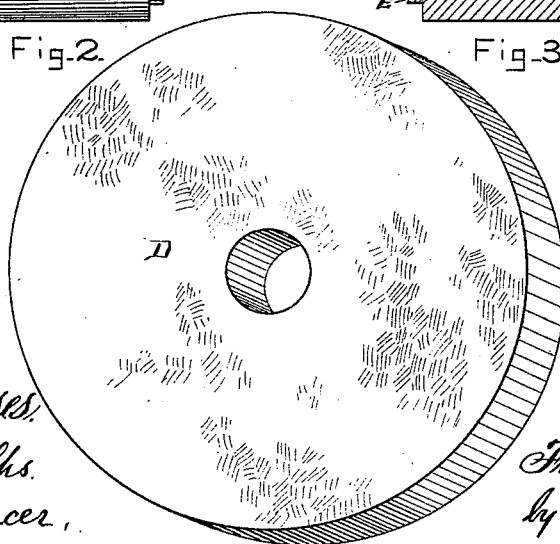


Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

FRANCIS A. CUSHMAN, OF LEBANON, NEW HAMPSHIRE.

WOOD-PULP GRINDER.

SPECIFICATION forming part of Letters Patent No. 304,182, dated August 26, 1884.

Application filed May 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. CUSHMAN, a citizen of the United States, residing at Lebanon, in the county of Grafton and State of New Hampshire, have invented certain new and useful Improvements in Wood-Pulp Grinders; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to that class of pulp-grinders in which the wood to be converted into pulp is held in pockets and pressed against the sides of the grinder in a direction parallel to its axis.

My invention is embodied in a rotary grinder consisting of a metallic shell fitted on the driving-shaft and provided with a broad peripheral flange or circular band formed in one with a disk or web radiating from a central hub, in combination with removable stones of annular form fitted into the recesses of such shell, so as to be supported against the strains of use by the radial disk, and against centrifugal force by the peripheral band.

My invention also includes the herein-described process of forming my improved wheel.

In the drawings, Figure 1 is a side view of part of a grinding-roller constructed according to my invention. Fig. 2 is an edge view, and Fig. 3 a central section, of the same. Fig. 4 shows one of the stones detached.

A is the shaft, mounted in suitable bearings and furnished with the usual driving-pulleys.

B is the web or radial disk secured upon the shaft, and C the peripheral flange, formed integral with or secured firmly to the web B, leaving a cylindrical recess each side of the disk B, between the shaft and the flange C.

DD are annular stones cut transversely from a sandstone cylinder, or turned from the natural rough stone, in the manner usually adopted in forming grindstones. Each stone, having an eye at its center to fit the shaft, is made of such diameter as to just fit within the flange C, so as to have efficient support therefrom against the bursting strains of centrifugal force. The stones D may vary somewhat in thickness, and therefore project more or less beyond the edge of the flange C. When such projection is considerable, I shrink upon the exposed part of the periphery of the stone

an iron or other tenacious metallic hoop, E, in order to effectually resist the bursting of the stone when run at a high speed. The hoop E may, for special precaution, be secured laterally to the flange C, if required.

F F are collars on the shaft A, extending in front of the central part of the stones D D.

G G are nuts screwed upon the shaft to tighten the collars against the faces of the stones. By these various means the stones are most securely held on opposite sides and peripherally, and all the strains of use are guarded against.

With this construction a clear annular space on the outer face of each stone is provided as a grinding-surface. The wood to be reduced to pulp is placed in pockets formed in a casing inclosing the grinder, and is pressed by suitable means against this annular surface as the grinder revolves. This pressure, being exerted simultaneously on opposite sides of the grinder, pressing each stone against the web B, does not injuriously affect the bearings, since the lateral strains neutralize each other.

It is generally admitted that a sand or natural stone grinder produces better pulp and more of it in a given time than does a filled emery-wheel, and hence is greatly to be preferred.

By my improvement the annular stones D may be removed from the shells B C whenever they become injured or worn, and other like stones may be readily slipped therein without interrupting the use of the grinder more than a few minutes, or requiring any duplication of shells or freight-charges on sending them away to be filled with plastic material, involving long delay to harden. My present construction is therefore a great improvement over the former styles of grinders, or over the method of forming grinders heretofore practiced.

I claim as my invention—

1. The shaft A, radial web B, and peripheral flange C, in combination with the annular stones D D, formed distinct from the metallic shell, and provided with the collars F and pressure-nuts G, substantially as set forth.

2. The metallic shell having web B and flange C, in combination with the stone disks D D, insertible in and removable from said shell, and with the peripheral hoop E, substantially as set forth.

3. The process herein described of forming

rotary grinders, which consists in casting a
metallic shell with an annular recess each side
of its central web, turning two disks of stone
to fit said recesses and inserting them therein,
5 applying to the outer faces of said disks flat
collars and tightening them thereon by nuts,
for the purpose set forth.

In testimony whereof I hereto affix my sig-
nature in presence of two witnesses.

FRANCIS A. CUSHMAN.

Witnesses:

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