B. F. BARKER.

Wood-Grinders.

No. 150,932. Patented May 19, 1874.

Fig: 1.

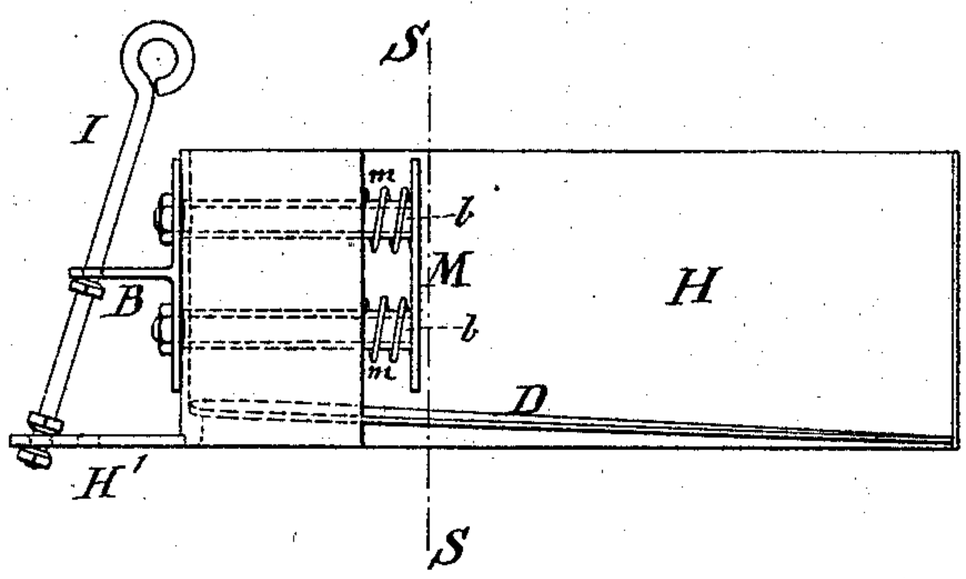


Fig: 2.

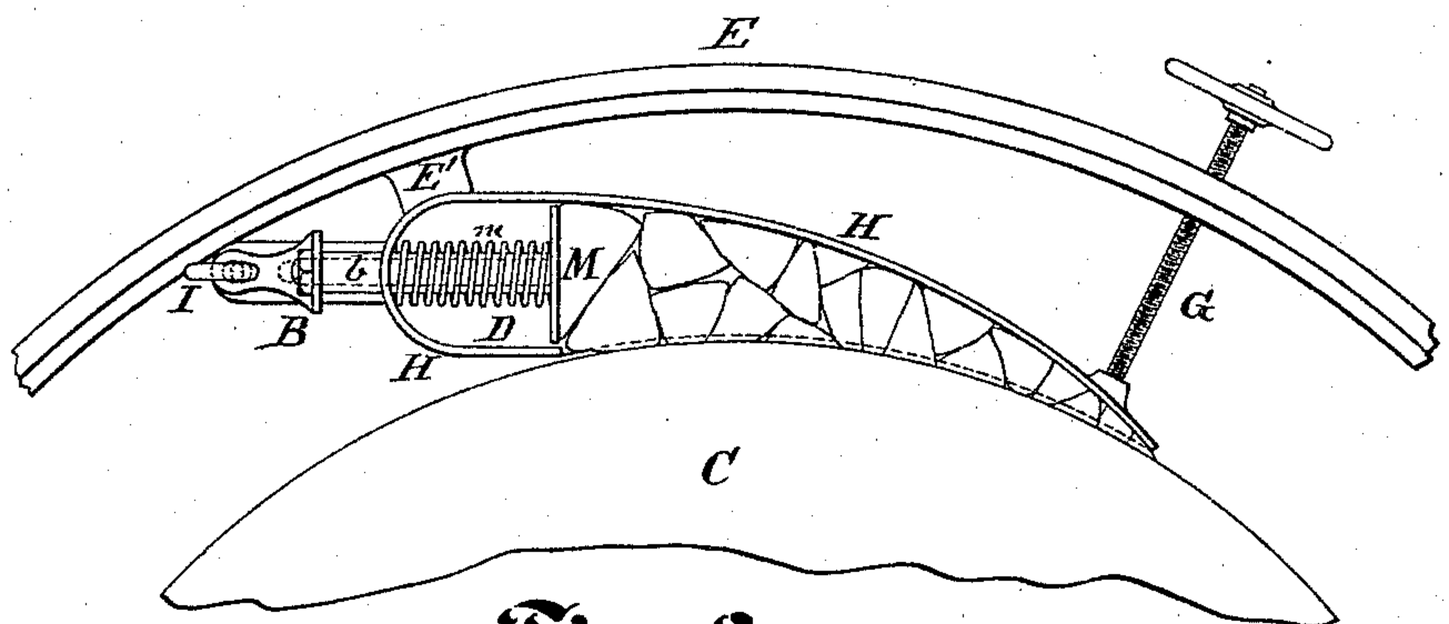
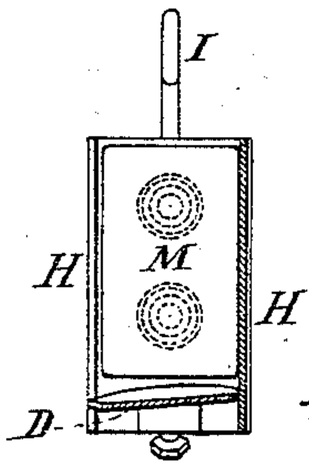


Fig: 3.

Witnesses:

Arnold Bonnarm.

Wm. C. Dey



Inventor:

B. F. Barker

by his attys P. D. Stetson

UNITED STATES PATENT OFFICE.

BENJAMIN F. BARKER, OF CURTISVILLE, MASSACHUSETTS.

IMPROVEMENT IN WOOD-GRINDERS.

Specification forming part of Letters Patent No. **150,932**, dated May 19, 1874; application filed September 4, 1873.

To all whom it may concern:

Be it known that I, BENJAMIN F. BARKER, of Curtisville, Berkshire county, Massachusetts, have invented certain Improvements relating to Machines for Grinding Wood for Paper-Stock, of which the following is a specification:

I have, in a patent issued to me, dated September 19, 1871, No. 119,107, described a machine in which a stone revolving like the upper stone of a grist-mill acts, by its periphery, upon masses of wood contained in holders, which present a wedge-form space for the wood, and in which the wood is continually urged toward the narrow end of the wedge by the pull of the stone. My present invention relates to the same general construction; and consists in improvements in the holder, whereby the broad flange extending out from the lower edge of the stone, and turning with it in my former method, is dispensed with, and the action of the stone on the wood, as also the reverse action of the wood on the stone, is materially improved.

The accompanying drawings form a part of this specification, and represent my improved wood-holder and the adjacent parts.

Figure 1 is an elevation of the wood-holder detached from the machine, and viewed on the side which is presented to the stone when in use. Fig. 2 is a plan view of the same filled with wood. This view also exhibits a portion of the stone and of the fixed casing which surrounds the stone. It also shows a screw, by which the distance of that end of the holder from the stone is adjusted at will. Fig. 3 is a transverse section on the line S S in Fig. 1.

Similar letters of reference indicate like parts in all the figures where they occur.

C is the stone, rapidly and steadily revolved by some suitable power not represented; and E is a fixed casing, which surrounds it at a suitable distance, as represented. The body of the wood-holder is composed of a bottom, D, with sides H. It is made of cast-iron, or other suitable rigid material, and is pivoted, near one end, on an arm, E′, which extends inward from the casing E, while the other end is held close to the periphery of the stone C by means of the screw G, and is adjusted inward thereby to compensate for the gradual reduction of the diameter of the stone as the machine is used. The bottom D of the wood-holder is inclined in two directions. It inclines downward in the direction of the travel of the wood as it moves along in being consumed. This condition is plainly indicated in Fig. 1. It is also inclined in the direction of the radius of the stone, so that any given point in the surface of the wood which is presented to the stone moves downward a little on the stone as the wood moves forward in being consumed. I is a hand-lever, pivoted in an arm, H′, projecting backward from the bottom of the wood-holder, and operating a branch piece, B, carrying two horizontal rods, *b b*, attached to a plate, M. Surrounding each of the rods *b* is a coiled spring, *m*, the tension of which urges the plate M forward, pressing forward any wood which may be before it, so as to force it into the narrow part of the wedge-like interior of the wood-holder.

In operating the machine the periphery of the stone having been properly trued and pecked, and the holder filled with pieces of poplar or other suitable wood of a proper length, standing upright side by side, the tension of the springs *m* contributes its force, with the draft or pull of the stone, to urge the several pieces of wood constantly toward the narrow end of the wedge-space in which they are confined. As the stone removes the successive increments from their inner faces, and they become narrower, they thus move forward in obedience to this force, and the springs *m* extend, and maintain a nearly-uniform tension thereon. When this action has proceeded to a certain extent, the attendant introduces one or more fresh pieces of wood in a corresponding upright position behind the others, by taking them successively in one hand, and drawing back the plate M by acting on the hand-lever I with the other. On liberating the hand-lever I, the force of the springs *m* is again felt to drive forward the plate M, and thus to urge forward the wood until the whole is consumed.

In order to make the tension of the springs *m* as nearly uniform as possible, I employ stout wires of spring brass or steel, coiled, each, in a large helix, and nearly fill the interior of the helix by a loose sleeve that is free to roll.

Springs thus mounted maintain a proper ten-

sion, even when the plate M is in its extreme forward position, and, when drawn back by the hand-lever, remain in place without serious crooking or other derangement.

There may be four or other desired number of these wood-holders around each stone C. There may, also, be corresponding wood-holders on the upper surface of the stone. Such might also be worked with some success on the lower surface, proper provisions being made in each case for supplying clear water, and for conducting away the water with the wood-pulp which it contains.

The inclination of the motion of the wood, relatively to the stone, causes all ridges on the stone to be rapidly worn off. Suppose a series of ridges, parallel to each other, extending around the stone: They will tend to grind corresponding ridges in the wood; and then, as the fibers are ground off, they are necessarily short. But the base of each of my wood-holders is so inclined that, as the wood feeds slowly forward, it gradually sinks or rises, and thus brings the top of each ridge of the stone against new places on the wood. It follows that such ridges never form; or, if any are commenced, they are immediately worn off. The true surface of the stone works against a true surface on each piece of wood, and long fibers are ground off, which may, in theory, extend the whole height of the stone. In practice I get, by means of my improvement, much longer fibers than heretofore, and this still further improves the resulting pulp.

I claim as my invention—

1. In combination with a revolving stone, C, the wood-holder described, having its bottom D inclined relatively to the stone, so that the wood, in feeding forward, shall move obliquely across the line of motion of the grinding-surface, as specified.

2. The grinding-stone C, and the wood-holder H, in combination with the follower M, springs *m*, and lever I, and its connecting branch piece B, with its rods *b b*, for conveniently drawing back the follower for the introduction of new material, as herein specified.

In testimony whereof I have hereunto set my hand this 28th day of August, 1873, in the presence of two subscribing witnesses.

BENJA. F. BARKER.

Witnesses:

A. B. PITKIN,

K. E. GARDNER.