B. F. BARKER.

Machine for Grinding Wood for Paper-Pulp.

No. 160,996. Patented March 23, 1875.

Fig: 1.

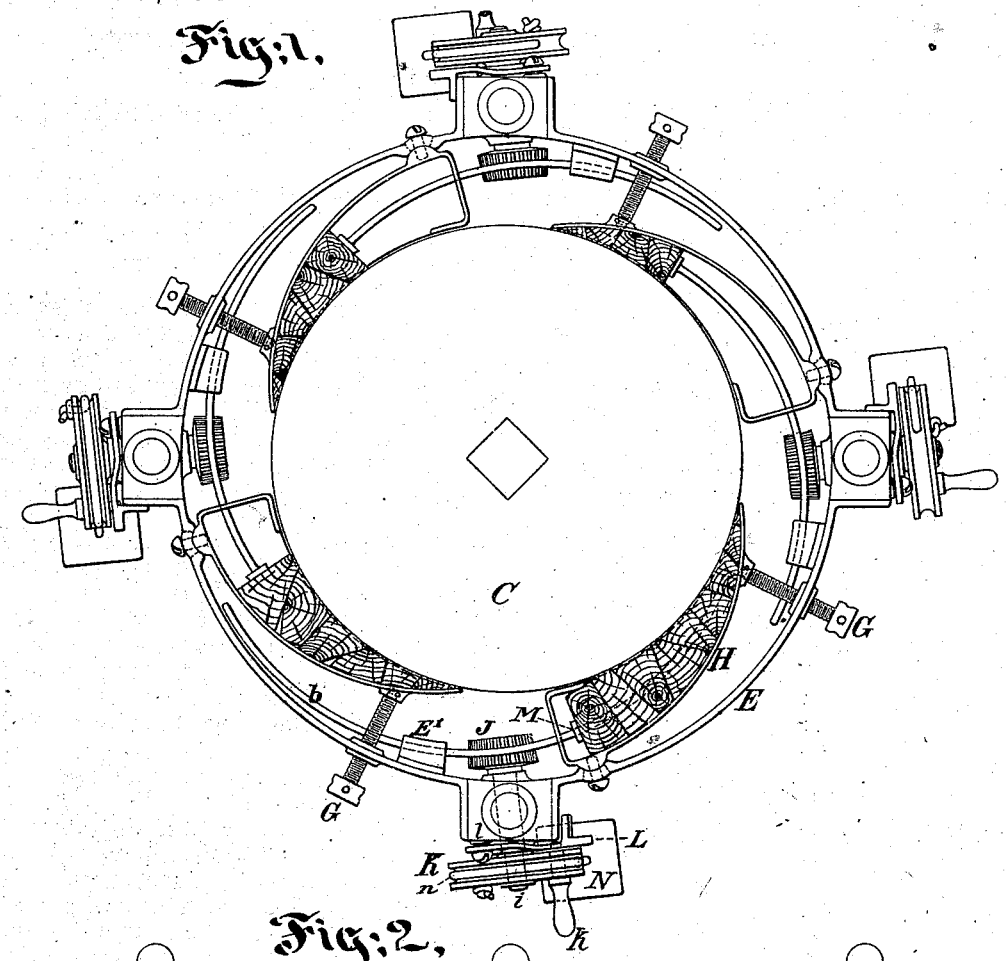
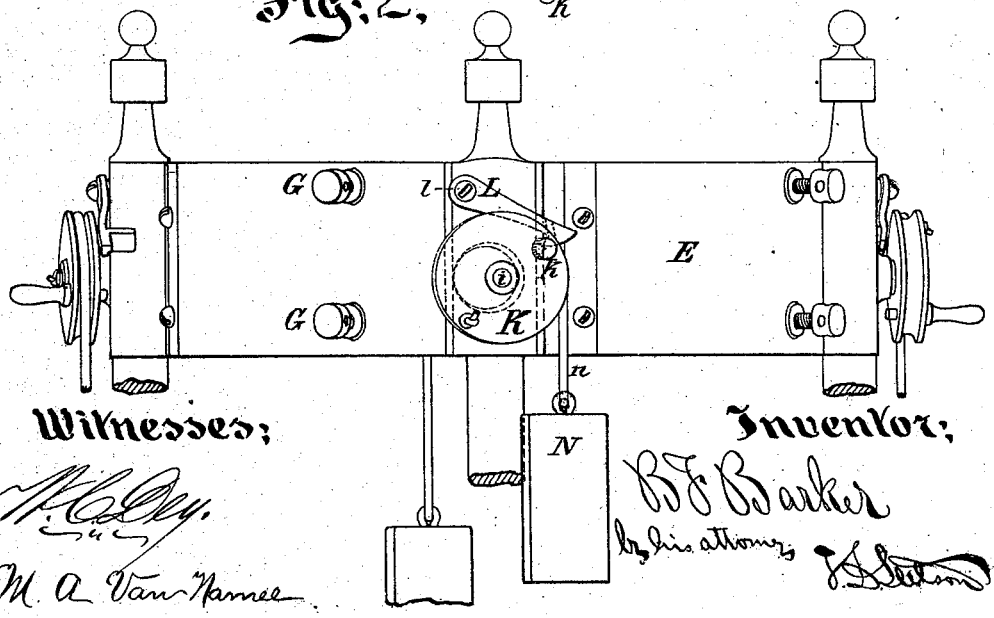


Fig: 2.



Witnesses;

M. A. Van Namee

Inventor;

B. F. Barker

by his attorneys

UNITED STATES PATENT OFFICE.

BENJAMIN F. BARKER, OF CURTISVILLE, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR GRINDING WOOD FOR PAPER-PULP.

Specification forming part of Letters Patent No. **160,996**, dated March 23, 1875; application filed August 6, 1874.

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 Pulp, of which the following is a specification:

The invention relates to the means of applying and feeding the wood to the grinding-stone.

The mill is of that class where a burr-stone or other suitable stone is revolved on a vertical axis, and acts on the wood at its periphery. The wood is applied in short lengths, held with the grain parallel to the axis of the stone. It is drawn by the motion of the stone into a gradually-contracting or wedge-like space. It is wedged forward into this space, and consequently into intimate contact with the stone, partly by the motion of the stone itself, and partly by a force applied through the medium of a pushing-piece thrust in from behind. When the wood is partially consumed the pusher is drawn back, and fresh pieces of wood are applied, which are then acted on by the pusher.

Corresponding pushing-pieces have been before used, acting by the force of springs. It is difficult in practice to make the action of springs uniformly reliable.

I form teeth on the under side of the pusher-bar, match therein the teeth of a small pinion, extend the shaft of the pinion outside of the mill-casing, and fix thereon a large grooved pulley and crank. The hand of an attendant applied to the crank draws back the pusher by a simple and easy movement. A weighted cord wound in the groove on the pulley gives a uniform force to the pusher in pressing forward the wood. I provide an automatic stop for the motion of the pusher by mounting a hinged piece or pawl close to one face of the pulley, and fixing a pin in the pulley-face, which stops against the hook of the pawl when the pusher has been driven to its extreme forward position.

In winding up the weight and running back the pusher, the pawl is automatically lifted to allow the passage of the pin, and then falling, engages the pin and holds the pusher in the extreme backward position, to allow fresh wood to be inserted at leisure. When the attendant has got the wood properly in place he lifts the pawl by a movement of his finger, and the pusher comes into action, exerting thenceforward a uniform force, until the pulley has made one complete revolution, bringing the pusher into its extreme forward position, in which position it comes to rest again against the stop. The stop may be formed by the extension of the crank-handle through the pulley.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention. They represent one of the feeding devices complete with the adjacent portion of the stone. I propose to use four of these feeders with a stone of the ordinary size.

Figure 1 is a plan view, and Fig. 2 a side elevation.

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

C is the stone; M, the pusher-plate; *b*, a curved pusher rod or rack of rectangular cross-section; E, the stationary casing around the stone, and G adjusting-screws tapped through the casing E, and acting against an adjustable curved piece, H, which is hinged to the casing E at the point *h*, and is adjustable at the other end by the screws G, so as to stand close to, but without touching, the periphery of the stone C. The bottom of the casing H is inclined relatively to the motion of the stone, so that the wood, in being fed forward therein, moves downward as well as forward, thus tending to avoid the formation of grooves on the stone or wood. J is a pinion fixed on the shaft *i*, and meshing into the teeth on the under side of the pusher-rod *b*. K is a grooved pulley fixed on the shaft *i* outside of the casing E, and *k* is the handle or crank-pin set in the pulley K, and extending sufficiently through the same to form a stop on the inner face, which is engaged by the pawl L turning on the pivot *l*. N is a weight attached to the cord *n*, which is wound in the groove in the periphery of the pulley K. The size of the pinion J should be such that one complete revolution thereof induces the full proper range or traverse of the pusher-rod *b*. The latter is guided in a slot where it enters the casing H, and also in an eye, E′, fixed on the inner face of the casing E. The acting end of the pawl L is beveled

so that it is lifted automatically when the cranked pulley K is turned around to draw back the pusher. It falls as soon as the pin *k* has passed it, and, when thus conditioned, it supports the weight N, holding the pusher back out of the way for an indefinite period.

The means heretofore proposed for feeding forward the wood have been objectionable in several important points, which this apparatus overcomes. Springs of any ordinary construction are unreliable, and exert a sensibly greater pressure when forced back to their fullest extent, growing less as the pusher moves forward. Serious labor was imposed upon the attendant in forcing back the spring, and he was obliged to hold it during the hasty and consequently imperfect adjustment of the wood.

With my improved feeder the wood can be selected and fitted with any desired degree of nicety. When all is ready, the touch of a finger to lift the pawl L allows the pushing-force to be instantly applied. It is thereafter uniformly maintained until the pusher is moved to its extreme forward position, when it is positively and firmly stopped.

A delicate female or other attendant with little strength can maintain the proper action in a considerable number of these feeders without severe labor.

I am aware that wood has been fed to a stone by a direct radial movement, actuated by a weight, and with means for pulling back and holding back the forcing-plate; but I know of no previous attempt to apply any corresponding device to the circular feeding, which is essential to the proper presentation of large quantities of wood with gentle feeding-force.

My oblique casings H allow a slight force to urge the wood very efficiently, being aided by the drawing action due to the motion of the stone.

I claim as my invention—

1. In combination with the stone C and oblique casing H, the feeder M, curved rack *b*, pinion J, pulley K, and weighted cord *n*, operating together as herein specified.

2. In combination with the stone C, casing H, feeder M, connected pulley K, and pin *k*, the stop-pawl L serving to arrest the feeder at both ends of its motion, as herein specified.

In testimony whereof I have hereunto set my hand this 23d day of July, 1874, in the presence of two subscribing witnesses.

BENJAMIN F. BARKER.

Witnesses:
H. M. BUNALL,
W. R. CLARKE.