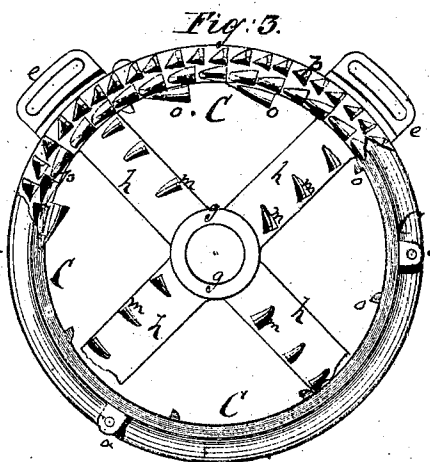
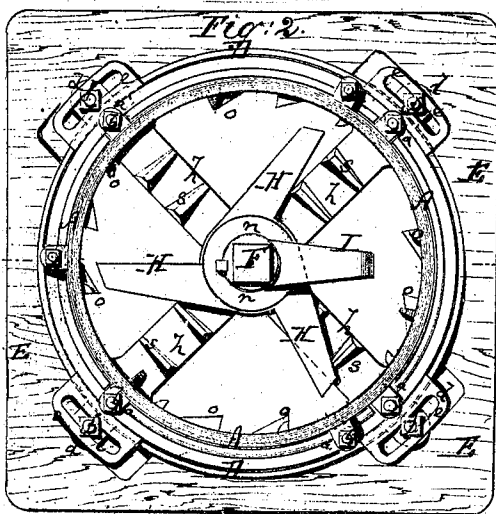
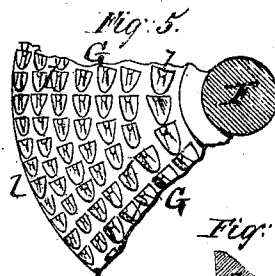
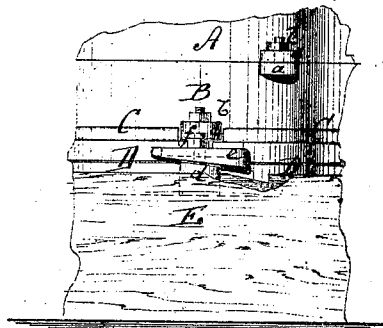
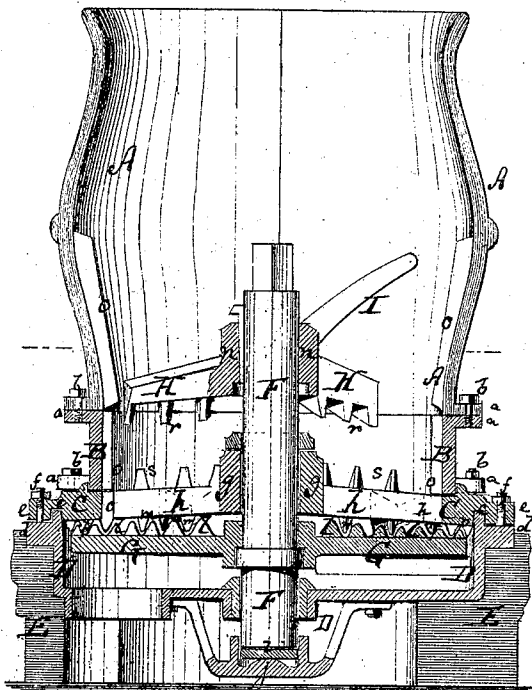


Palen & Avery,

Bark Mill.

No. 111,239.

Patented Jan. 24, 1871.



Witnesses:

E. Raetig
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United States Patent Office.

GILBERT E. PALEN AND FLORELLO P. AVERY, OF TUNKHANNOCK,
PENNSYLVANIA.

Letters Patent No. 111,239, dated January 24, 1871.

IMPROVEMENT IN BARK-MILLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, GILBERT E. PALEN and FLORELLO P. AVERY, of Tunkhannock, in the county of Wyoming and State of Pennsylvania, have invented a new and improved Bark-Mill; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a vertical central section of our improved bark-mill.

Figure 2 is a plan or top view partly in section of the same.

Figure 3 is an inverted plan view, partly in section, of the stationary grinder.

Figure 4 is a detail side view of the apparatus.

Figure 5 is a detail plan view of a portion of the rotary grinder.

Figure 6 is a vertical section through one of the teeth of the rotary grinder.

Similar letters of reference indicate corresponding parts.

The object of this invention is to improve the machines for grinding bark in such manner that they can be adjusted to any extent, readily repaired, and be perfect in their operation.

The invention consists in the introduction of various details of construction, as hereinafter more fully set forth.

A in the drawing represents the hopper of our improved bark-mill. This hopper is made wider in the middle than it is at the upper and lower ends. This is an advantage, as the contents cannot be worked outward by the rotary stirrers, and as they are properly fed toward the center of the grinder by the contracted lower part.

If the hopper is largest at the upper end, its contents will readily work out by the stirrers.

To the lower end of the hopper is secured an extension ring, B, which at its lower edge carries the stationary annular grinder C.

The grinder-ring C has outward-projecting flanges *a*, which are, by means of screws *b*, secured to similar flanges that project from the ring B. The latter is in a similar manner secured to the body of the hopper.

Heretofore the stationary grinder was generally formed and made in one piece with the body of the hopper.

If any portion of the lower part was broken, the entire hopper was useless, and had to be replaced. By our plan the most exposed part is made in form of the ring B, and if that should be broken by the excessive internal strain it can readily be replaced, while all the

other parts may be retained. If the stationary grinder should be worn, it can be replaced without requiring a new hopper.

The upper part of the mill, consisting of the parts A B C just named, is placed upon the cup D, which is to receive the ground bark.

The cup is firmly secured in or upon the supporting-frame E. It has a projecting ledge, *c*, which fits into a groove of the ring C, to form a close joint. On the outside the cup has projecting ears *d d*, with inclined upper surfaces, and the ring C has corresponding ears *e*, with inclined lower faces. The ears *e* rest upon *d*, and are secured thereto by screws *f*, as shown in fig. 4. By shifting the ring C on the cup, or rather the ears *e* on the ears *d*, the height of the hopper and appendages may be varied so as to vary the distance between the two grinding surfaces.

The grinding-shaft F rests in a socket which is provided in the center of the cup D, and is steadied by a ring, *g*, formed by the inner radial arms, *h*, of the ring C and the bushing in the cup D.

The lower end of the shaft is supported by a plate, *i*, which rests on a convex projection or bump, *j*, that projects from the bottom of the socket. The plate *i* can thus rock upon the bump *j*, and will therefore always be self-adjusting to end of the shaft. This stepping is only applicable to mills driven from above, those driven from below being provided with a square-ended shaft, as in ordinary mills.

The bushing in cup D is provided for the purpose of securing the cup from wear, and can be replaced when worn so far as to damage the mill. It is made sharp on its upper surface, so that the ground bark or dust will not lodge on it and work down around the shaft.

G is the rotary grinder, mounted on the shaft F, under arms *h* of the ring C. Upon its surface are formed, in concentric rings, projecting teeth or grinding blocks *l l*, which are larger toward the center and smaller at the rim, as is clearly shown in fig. 5.

The teeth are of nearly triangular shape, as seen from above, their front or grinding-faces being radial to the center of the grinder. From the upright grinding surface they gradually shut downward toward the back end. The bark to be ground is, by the centrifugal force, thrown outward from the center; that crushed by one tooth is thrown off into the space between that tooth and the next outer row, and as it is further thrown outward it is finally taken up by the tooth of the next row and crushed, and then thrown into the next row, &c.

Radially the teeth are not in line, so that whatever bark leaves one row will pass on to the next, and cannot be skipped by any one row.

In longitudinal section the teeth appear as in fig. 6, with their grinding-surfaces nearly upright.

The spaces between the several concentric rows of teeth *l* are cleaned by ears *m* projecting downward from the arms *h*. The under side of this grinder is provided with a scraper, to keep the ground bark from accumulating in the cup *D*, and upon the bushing.

Upon the upper part of the shaft *F* is mounted a ring, *n*, which carries a series of stirrers, *H H*, and projecting above them an oblique horn, *I*, whereby the large pieces of bark are broken. This horn and the stirrers act in conjunction with ribs *o o*, which are formed on the inner faces of the hopper and rings *B* and *C*. This horn prevents the unground bark from lodging on the stirrers and floating or riding around, and keeps the rotary grinder supplied with bark as long as the hopper contains any.

The lower face of the ring *C* is set with teeth *p p*, which are similar in shape to those on the rotary grinder, but less broad, as indicated in fig. 3. It has also stops or projections between the radial arms on the inner annular surface, to prevent the ground bark from passing from one arm to the other, thus hastening its passage outward through the finishing teeth.

The stirrers have downward-projecting teeth *r r* on their lower faces, which act in conjunction with upward-projecting teeth *s* on the arms *h*, to break the coarse bark. These teeth are conical in form, so as to make them open or close more evenly all around by moving the stirrer up or down on the shaft.

Having thus described our invention,

We claim as new and desire to secure by Letters Patent—

1. The hopper *A*, the flanged extension-ring *B b*, and flanged, grooved, stationary grinder *C a e*, combined as described, with a cup, *D d*, rotary grinder *G*, and shaft *F*, for the purpose specified.

2. The hopper *A*, diametrically larger in the middle than at each end, and having the ribs *o* thereon, combined as described with a bark-breaking, oblique, and rotating horn *I*, for the purpose specified.

G. E. PALLER.
F. P. AVERY.

Witnesses:

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