(No Model.)

G. A. YOUNG.

GRINDING MILL.

No. 394,238. Patented Dec. 11, 1888.

Fig. 1.

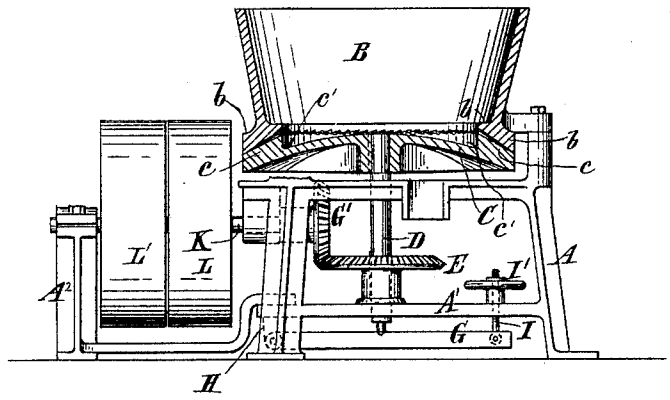


Fig. 2.

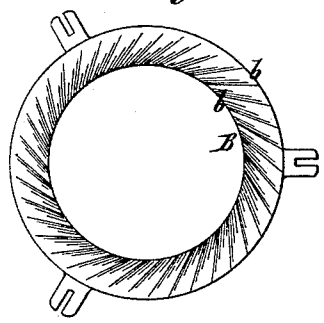
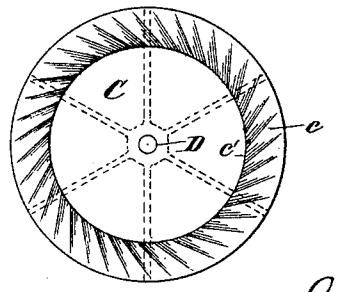


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE A. YOUNG, OF BROOKLYN, NEW YORK.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 394,238, dated December 11, 1888.

Application filed December 2, 1885. Serial No. 184,507. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. YOUNG, of Brooklyn, in Kings county and the State of New York, have invented a certain new and useful Improvement in Grinding-Mills, of which the following is a specification.

My improvement is particularly intended for embodiment in mills which are employed for grinding paint and analogous materials.

I will describe a grinding-mill embodying the improvement, and then point out the various features of the improvement in the claim.

In the accompanying drawings, Figure 1 is a side elevation of a grinding-mill embodying my improvement, the upper portion being shown in section. Fig. 2 is an inverted view of the hopper and stationary grinding-surface. Fig. 3 is a top view of the runner or rotary grinding-surface.

The same letters of reference designate the same or corresponding parts in all the figures.

A designates the main frame of the machine. It is preferably cast in one integral piece. As shown, it consists, essentially, of three legs supporting a plate provided with a spout or chute and a holder for the hopper B.

The hopper B may be made of cast metal. It is of circular form and tapers or decreases in size downwardly. At the lower edge it has an inwardly and outwardly extending flange, *b*, which rests upon and is supported by the frame A. The under surface of the flange *b* constitutes the stationary grinding-surface of the mill. It is inclined upwardly from the outer to the inner circumference, and has formed in it a series of grooves which are deeper at the inner circumference than at the outer circumference of the flange. These grooves are not radially arranged, but are arranged so as to be tangential to a circle of somewhat smaller diameter than the inner circumference of the flange.

C designates the runner or rotary grinding surface or part of the mill. Its under side may be flat or concave, or of any appropriate shape, and may be provided with a hub for fitting upon the shaft or spindle D, by which it is carried, and with a number of radial strengthening-ribs. Its upper surface is composed of an outer rim or flange-like portion, *c*, which is elevated above the central portion, *c'*, which it surrounds, and provided with a series of grooves that are approximately tangential to a circle smaller than the inner diameter of this portion and deeper at the inner than at the outer circumference. This outer rim or flange-like portion has its upper surface inclined upwardly from the outer to the inner circumference. Its incline should approximately correspond with the incline of the lower surface of the flange *b*, belonging to the hopper B.

The central portion, *c'*, of the runner C is convex, being much higher at the center than at its junction with the rim or flange-like portion *c*.

The spindle D, which carries the runner, passes through a bevel gear-wheel, E, that is supported upon an arm or bracket, A', arranged between the legs of the frame A. The spindle is connected to this bevel gear-wheel by means of a groove and spline, so that it will derive rotary motion from said gear-wheel and be capable of being elevated or lowered without affecting the position of the said gear-wheel. The spindle D at the lower end rests in a step-bearing provided in an adjustable arm, G. This arm G is hung at one end upon a bracket, H, relatively to which it may be swung as upon a fulcrum, and is fastened at the other end to a screw, I, that has applied to it above the bracket A' a nut and hand-wheel, I', which may be adjusted at pleasure. By adjusting this hand-wheel the spindle D, and consequently the runner C, carried by it, may be raised and lowered at will.

The bevel gear-wheel E engages with a pinion, G', which is affixed to a horizontal shaft, K, that is provided with fast and loose pulleys L L', and journaled at one end in a portion of the frame A and at the other end in an extension, A^2, of the frame A.

The extension A^2 may be made separately from the frame A and secured thereto by screw-bolts.

The construction of the runner C is of great importance. The difference in elevation between the outer rim or flange-like portion, *c*, and the central portion, *c'*, insures a grinding-surface for the runner of uniform width, even after wear and repeated dressings, for in dressing this grinding-surface the grooves will

not be elongated beyond their original dimensions, as is inevitably the case where the grinding-surface originally made and the central portion of the runner or flange are flush. This uniformity in the grinding-surface is of great importance, because the machine is more uniform in its action than it otherwise would be, and the labor of dressing and re-dressing the grinding-surface is materially reduced, because the grooves never become prolonged beyond their original dimensions by re-dressing them.

The protuberance or convexity of the central portion, *c'*, causes all hard substances to gravitate to the lowest portion, which is at the junction of such central portion, *c'*, with the rim or flange-like portion *c*.

Any pieces of metal or other extraneous or hard substances, which are always to be found in paint and like materials to be ground, will become separated from the paint and gravitate down to the junction of the central portion of the runner with the rim or flange-like portion, and will be retained there, so that they cannot pass between the grinding-surfaces with the paint or like material. The injury which the grinding-surfaces of mills commonly sustain by reason of the passage of such hard substances between them or through them is obviated. I also avoid by means of my improved construction of the runner the spreading of the grinding-surfaces of the mill by the passage of hard substances between them, and the consequent loss of the paint or other valuable material which is allowed to pass freely through the space between the grinding-surfaces at the time, and by its centrifugal force is thrown around the place where the mill is located.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a grinding-mill, the combination, with an upper grinding-surface inclining upwardly from its outer to its inner circumference, of a runner arranged below the same and having on its upper surface an elevated rim or flange-like portion provided with a grinding-surface inclining upwardly from its outer to its inner circumference, and a central portion which is convex and lowest at its junction with the rim or flange-like portion, substantially as specified.

GEORGE A. YOUNG.

Witnesses:
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