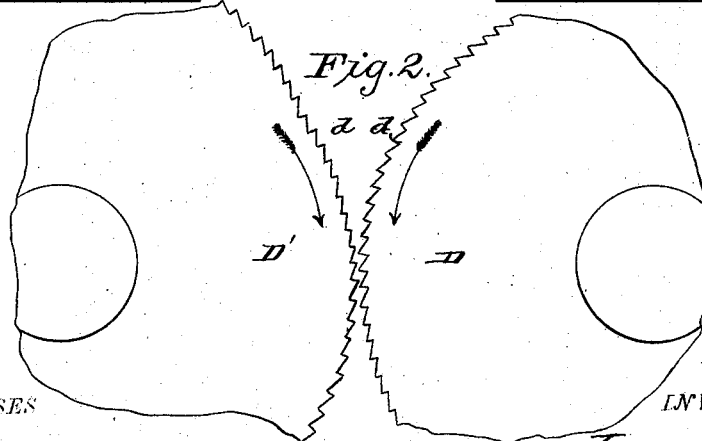
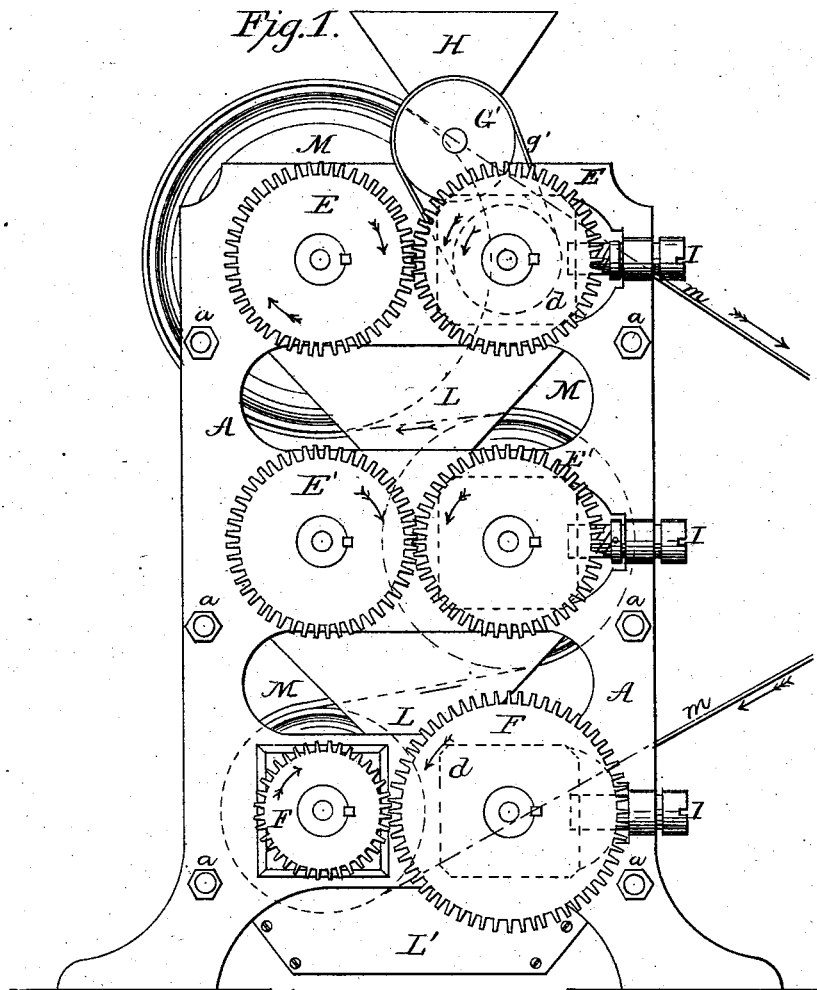


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ROLLER GRINDING MILL.

No. 260,669.

Patented July 4, 1882.



WITNESSES

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By Attorney

INVENTOR

James Dawson
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Fig. 3.

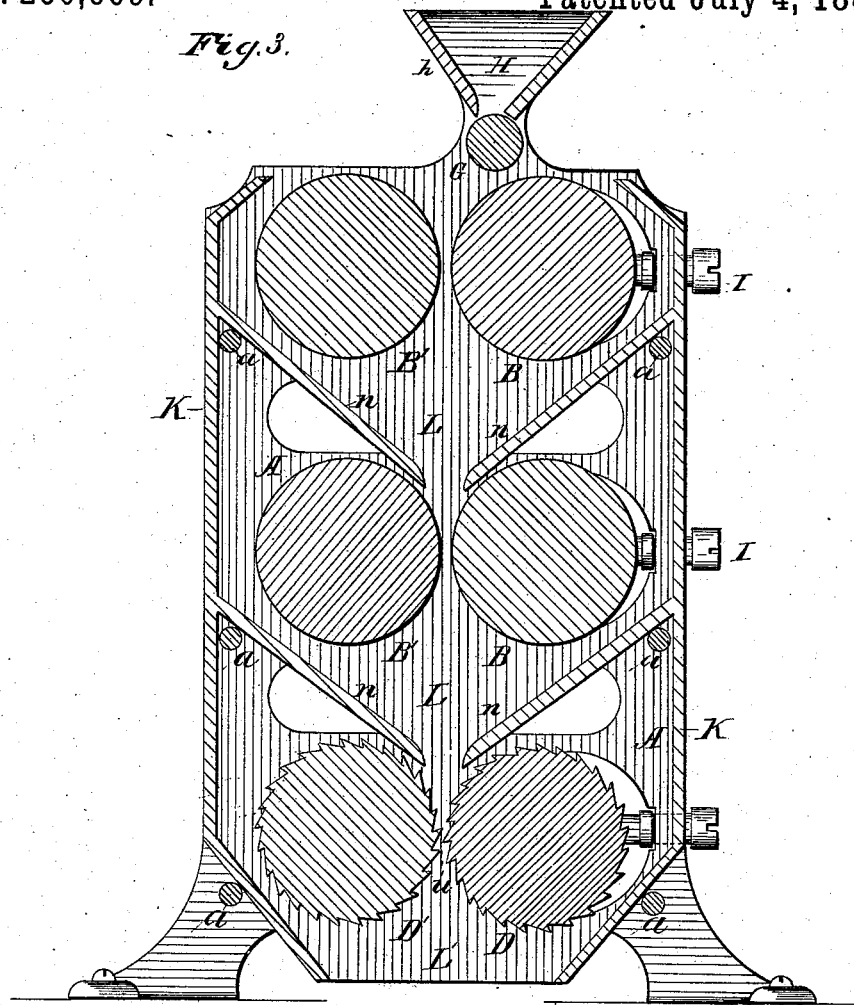
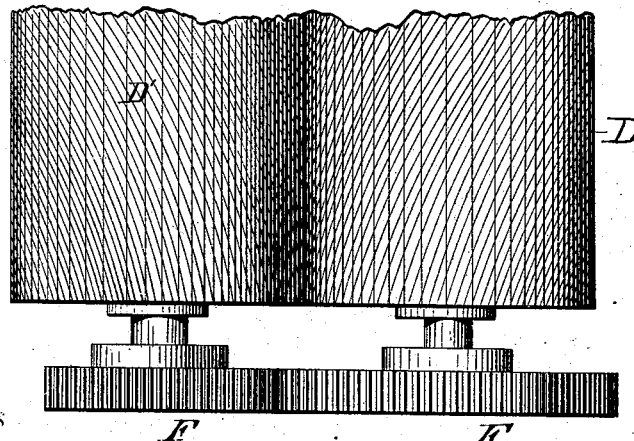


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES DAWSON, OF CLEAR GRIT, MINNESOTA, ASSIGNOR OF ONE-HALF TO
ROBERT L. DOWNTON, OF ST. LOUIS, MISSOURI.

ROLLER GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 260,669, dated July 4, 1882.

Application filed June 30, 1879.

To all whom it may concern:

Be it known that I, JAMES DAWSON, of Clear Grit, in the county of Fillmore and State of Minnesota, have invented certain new and useful Improvements in Roller Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being made to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents an elevation of the gearing side of the machine embodying my invention, showing in plain and dotted lines the mechanism by which the several pairs of rolls are operated. Fig. 2 represents a partial end elevation of the grooved rolls. Fig. 3 represents a vertical central longitudinal section of the machine; Fig. 4, a partial plan view of the grooved rolls and the operating mechanism.

My invention relates to certain new and useful improvements in the class of grinding-mills known as "roller-mills;" and it consists essentially in a novel dress applied to the rolls; and, further, in novel combination and arrangement of parts, all as will be hereinafter fully described, and specifically pointed out in the claims.

Similar letters of reference where they occur indicate like parts.

A A represent the standards, secured together by the cross-ties *a*, that constitute the frame which supports the adjustable and fixed bearing-boxes for the journals of the pairs of smooth and grooved faced rolls B B' and D D'. The pairs of smooth-faced rolls B B' are operated through the medium of gear-wheels E E' of like diameter, for producing a uniform rate of speed, while the grooved rolls D D' are operated by gear-wheels F F' of different diameter, to revolve at different peripheral speeds. These several pairs of rolls are driven by means of pulleys M, keyed to the axles of one roll of each pair, and which are of graduated size, the upper one being the largest, said pulleys receiving motion from a single belt, *m*, which moves in the direction indicated by the arrows from a suitable driving-wheel around the pulleys, as shown in Fig. 1, thereby greatly utilizing the power required for operating the several pairs of rolls.

H represents the supply or feed hopper ar-

ranged on top of the machine, and provided with the usual feed-roll, G, in the bottom thereof, and adjustable side for regulating the flow of the material to the first or upper pair of rolls; and L, the open-bottomed troughs, composed of the inclined gather-boards *n*, arranged between the pairs of rolls for receiving and delivering the material passing between each pair of rolls to the next succeeding pair of rolls; and L', the receiving box or hopper arranged below the last pair of grooved-faced rolls.

I represents the usual adjusting-screws for regulating the distance between the rolls.

To the rolls D D', I apply a dress composed of grooves cut or otherwise formed on their peripheries like the teeth of single-cut files, and take in one roll a spiral direction to the left and in the other a spiral direction to the right, or reversely to each other, and the angle at which the grooves are twisted or run may materially vary in different pairs of rolls, or in one roll it may be greater than in the other; but I prefer to have them arranged at an angle of about thirty-five degrees to the axis of each roll.

It will be observed that the teeth or ribs formed by the grooves (taking the rolls D' for an illustration) upon the advancing side *d* are of easy bevel, but on the other side fall away rapidly, the longer sides *d* of the teeth or ribs constituting the active or grinding surface of the rolls, and facing each other as the rolls revolve. These grooved rolls D D', having the dress constructed as above described, operate in a manner essentially different from the sharp-ribbed rolls heretofore used in this class of mills, the grain being operated upon in such manner that the starchy and glutinous portions are merely pulverized, while the bran and germ are bruised and rubbed, and at the same time, by the spiral direction the grooves take on the periphery of the rolls, the material is carried a short distance lengthwise of the rolls before passing between the ribs, thus producing a rolling or twisting action on the bran and germ, and thereby it is left in such condition as to be easily and readily removed from the middlings and flour by the ordinary bolting process, while with the sharp-ribbed rolls heretofore used the bran and germ are cut into

such fine particles that a large proportion will pass through the bolting-cloth with the middlings and flour during the bolting process, and thus require various subsequent manipulations to remove them.

The number of grooves in the rolls may vary for different degrees of fineness or different grades of work, or according to the substance to be reduced.

The operation of my improved machine is as follows: The grain from the hopper passes between the first or upper pair of smooth-faced rolls, having comparatively slow rate of speed, which crack or break it into large granular particles, which then pass between the next pair of smooth-faced rolls, which are regulated to reduce it to a still finer condition, rendering the granular particles more susceptible to the groove-faced rolls between which they subsequently pass, thereby causing a speedy reduction of the granular particles to the desired condition, readily separating the germ and bran therefrom, and leaving it in the condition before described, so as to be easily and readily removed from the middlings and flour by the ordinary bolting process.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a roller grinding-mill, the combination of the rolls D D', having a dress composed of ribs or teeth running in a spiral direction, the ribs or teeth of one roll running reversely to the ribs or teeth of the other roll, with the sides *d* of said ribs or teeth of easy bevel and their opposite sides of sharper bevel, whereby the corresponding sides *d* of the ribs or teeth constitute the active or grinding surfaces of the rolls, substantially as specified.

2. In a roller grinding-mill, the combination of the rolls D D', geared to revolve at different peripheral rates of speed; the roll D' running faster than roll D, and having a dress composed of ribs or teeth running in a spiral direction, the ribs or teeth of one roll running reversely to the ribs or teeth of the other roll, with the sides *d* of said ribs or teeth of easy bevel and their opposite sides of sharper bevel, whereby the corresponding sides *d* of the ribs or teeth of the rolls constitute the active grinding-surfaces, substantially as specified.

In testimony that I claim the foregoing as my own I have affixed my signature in presence of two witnesses.

JAMES DAWSON.

Witnesses:

S. S. DEMAREY,

BARNABAS DAWSON.