(No Model.)

J. D. MAWHOOD.

ROLLER MILL.

No. 384,919. Patented June 19, 1888.

Fig. 1.

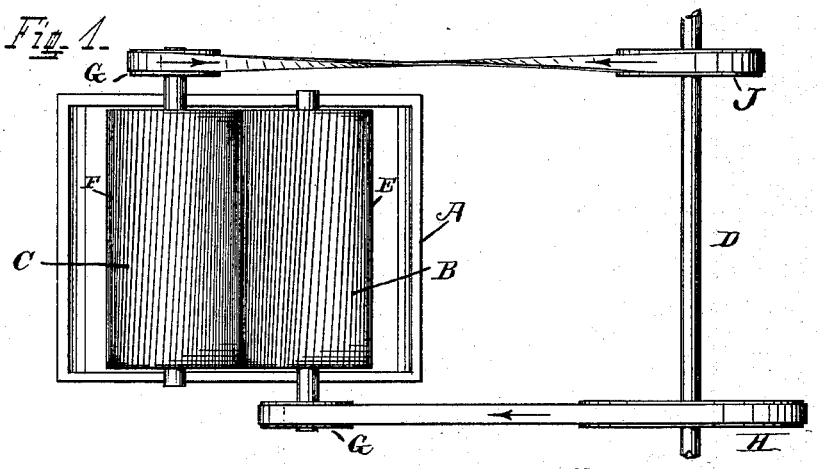


Fig. 2.

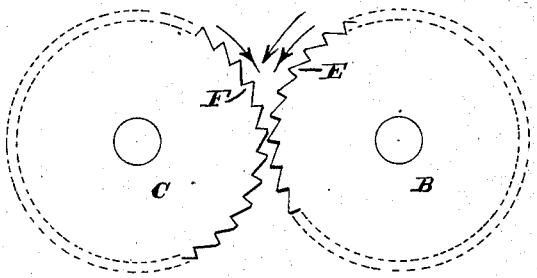


Fig. 3.

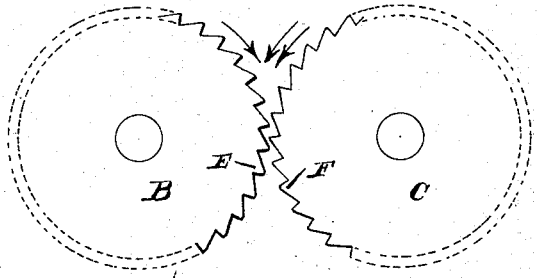
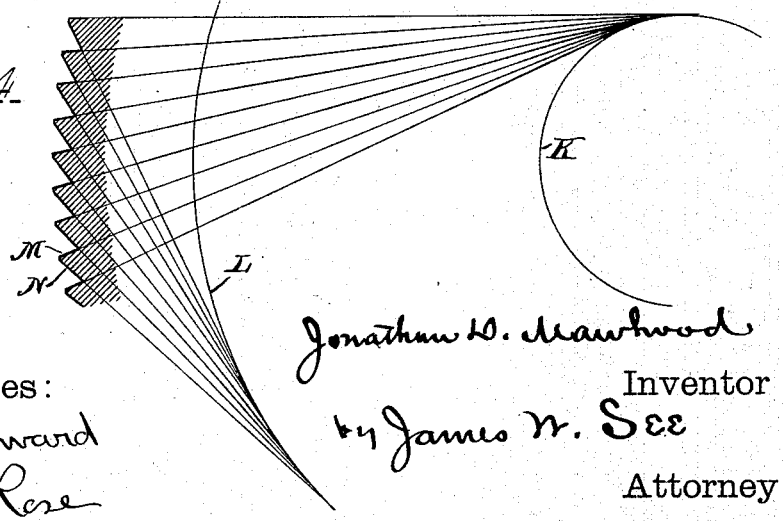


Fig. 4.



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JONATHAN D. MAWHOOD, OF RICHMOND, INDIANA, ASSIGNOR TO THE RICHMOND CITY MILL WORKS, OF SAME PLACE.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 384,919, dated June 19, 1888.

Application filed April 4, 1887. Serial No. 233,572. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN D. MAWHOOD, of Richmond, Wayne county, Indiana, have invented certain new and useful Improvements in Roller-Mills, of which the following is a specification.

This invention pertains to roller-mills employing a pair of corrugated rolls; and the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan of a roller-mill illustrating my improvements; Fig. 2, an end view or diagram of the pair of rolls arranged for cutting action; Fig. 3, a similar view or diagram showing the same pair of rolls when arranged for crushing or non-cutting action; and Fig. 4, a transverse section of a portion of the periphery of one of the rolls, this view forming, also, a diagram illustrating a method for describing a suitable contour for the corrugations.

In the drawings, A indicates a frame of a roller-mill; B, one of the corrugated rolls journaled in the frame; C, the other corrugated roll; D, a shaft from which motion is transmitted to the rolls; E, the corrugations of roll B; F, the corrugations of roll C; G, the pulleys on the shafts of the two rolls, shown as of equal diameter; H, a pulley on driving-shaft D, a belt transmitting motion from said pulley to one of the rolls; J, another but smaller pulley on shaft D, belted to the other roll; K in Fig. 4, a circle to which the faces of the corrugations of the rolls are tangent; L, a larger circle concentric to the circle K, to which the backs of the corrugations are tangent; M, the faces of the corrugations, and N the backs of the corrugations.

It is desirable that the corrugations of the rolls be laid spirally, as is usual, and it is also desirable that the edges of the teeth are somewhat flattened, as shown in Fig. 4, so that the edges do not present fragile acute angles. The backs of the teeth are tangent to a rear large circle, L, (seen in Fig. 4,) so as to give the backs of the teeth considerable slope. The faces of the teeth may be radial to the rolls; but it is much better to arrange them tangent to the small circle, as indicated in Fig. 4, so that the faces have a slight backward slope. The two rolls are made identical with each other in every respect, save that the teeth upon the two rolls face in opposite directions, as indicated in Fig. 2. In other words, in constructing the two rolls they are made duplicates of each other up to the time of corrugating. The corrugations are to face in opposite directions. The rolls, when complete, are therefore dissimilar, but are interchangeable as to location in the mill-frame.

With a pair of rolls corrugated and relatively arranged as shown in Fig. 2, and arranged in relation to the driving-shaft and pulleys as shown in Fig. 1, it is obvious that the top surface of the rolls will run toward each other, but that the surface of roll B will revolve the faster. The grinding-space is formed between the two rolls, and it is obvious that, theoretically, so far as the relative action of the teeth is concerned, the effect is as if roll C remained stationary while roll B revolved. The result is that the material being acted upon abuts against the faces of the teeth of roll C and is acted upon by the advancing faces of the teeth of roll B. As these faces are substantially radial to the rolls as compared with the backs of the teeth, it is obvious that the material being operated upon will be subjected to a decided cutting action, the action of the teeth under the circumstances indicated partaking of a shearing character. The rolls are to be thus used when such cutting action is desired.

Now, if we remove both rolls and reverse roll C endwise and place it in the bearings formerly occupied by roll B, and similarly reverse roll B endwise and place it in the bearings formerly occupied by roll C, and place the driving-belts as they were before and as they appear in Fig. 1, we will still have the rolls with their upper surfaces running toward each other and with the right-hand roll running faster, as before; but by reason of the facing of the teeth being reversed relatively in each roll the new arrangement will result in the teeth being related to each other, as indicated in Fig. 3. Again, the effect will be, theoretically, as if the left-hand roll remained stationary and the right-hand roll revolved toward it; but we will see that now the material being operated upon abuts against the sloping backs of the teeth of the left-hand roll and is acted upon by the slop-

ing backs of the teeth of the right-hand roll. The material being operated upon becomes thus subjected to a non-cutting action, the real action being more of the nature of a crushing or grinding one. The rolls are to be thus used when this non-cutting action is desired.

Rolls corrugated and arranged to run for cutting action are well known, as are also rolls corrugated and arranged to run for non-cutting action, and also rolls arranged for reversal in the mill-frame, so as to maintain the same tooth action with changed conditions as to direction of driving-belts, &c. Rolls have also been arranged to be changed from cutting to non-cutting tooth action by a rearrangement of pulleys and belts. So far as I know I am the first to devise an organized roller-mill in which the change from cutting to non-cutting tooth action can be made by simple transposition of rolls.

I claim as my invention—

A roller-mill comprising a pair of interchangeable transposable rolls having teeth facing reversely relatively upon the two rolls, the faces and backs of the teeth being at dissimilar angles, and a driving-shaft and pulleys arranged to transmit motion to said two rolls and to revolve one roll at a higher rate of speed than the other, substantially as and for the purpose set forth.

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Witnesses:

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