(No Model.) 2 Sheets—Sheet 1.

J. G. SKELTON.

MILL FOR GRINDING MICA.

No. 546,197. Patented Sept. 10, 1895.

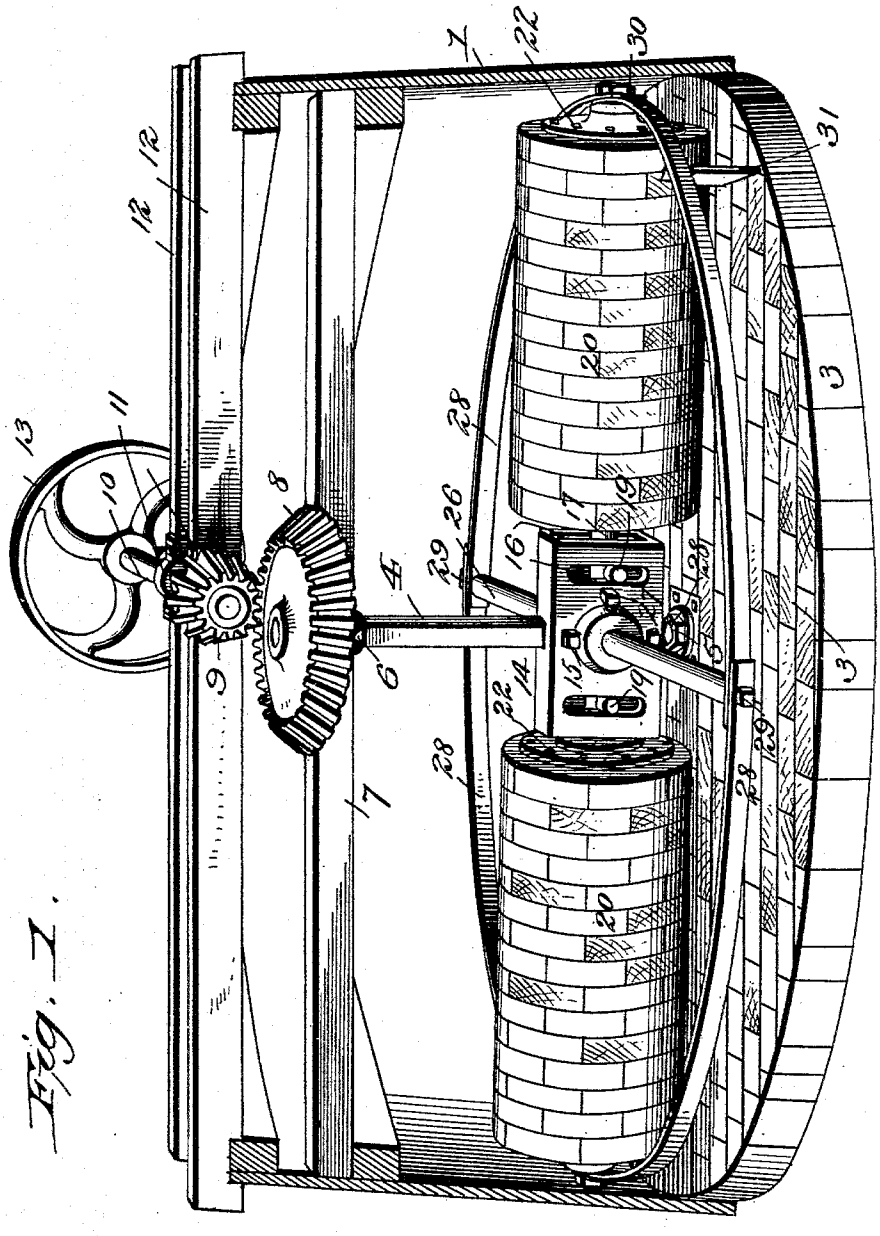

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

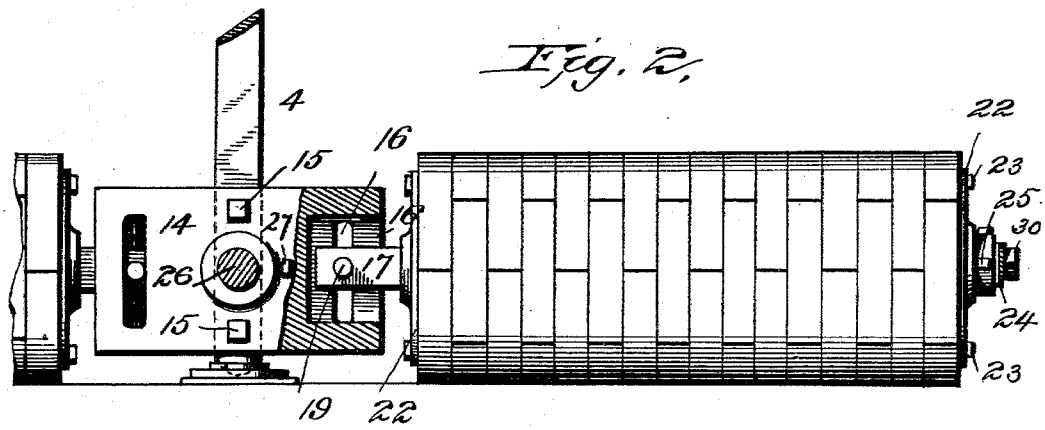


Fig. 3.

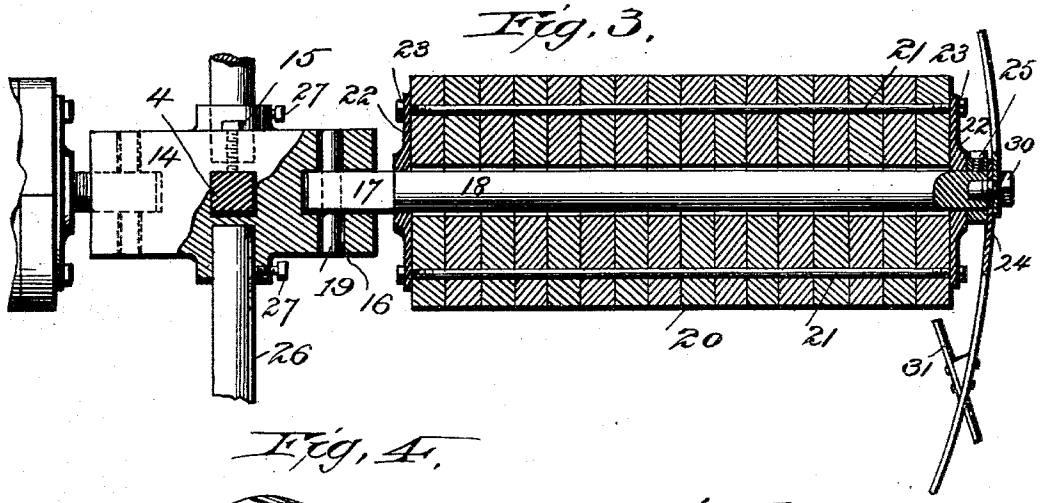


Fig. 4.

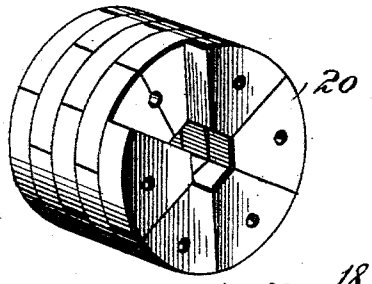


Fig. 5.

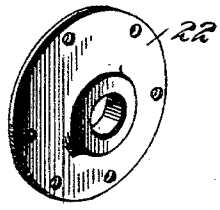
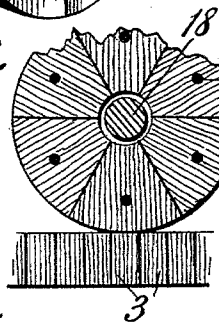


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN GIFFORD SKELTON, OF RICHMOND, VIRGINIA, ASSIGNOR TO THE RICHMOND MICA COMPANY, OF SAME PLACE.

MILL FOR GRINDING MICA.

SPECIFICATION forming part of Letters Patent No. 546,197, dated September 10, 1895.

Application filed May 20, 1895. Serial No. 549,946. (No model.)

To all whom it may concern:

Be it known that I, JOHN GIFFORD SKELTON, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Mills for Grinding Mica; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to grinding-mills, more particularly to mills for grinding mica; and it has for its object to produce a mill of this sort simple in construction and efficient in operation, and in which the bottom of the tub and the face of the grinding-rolls will be formed of hard wood, "end on," so as to obtain a surface to the bottom of the tub and to the face of the rolls which will be unyielding and hard as possible consistent with wooden surfaces. The reason for having the wooden grinding-surfaces is to avoid discoloration of the mica, which is a serious detriment to the mica, and which is liable to occur where metal grinding-surfaces exist, especially where the wet method of grinding is pursued, and which is the most desirable method, because if the mica be ground dry it becomes dead and loses its luster. With the view of preventing discoloration of the mica, I employ wood for the grinding-surfaces, and in order to render the grinding-surfaces durable and to have them as firm and hard as possible without resorting to metal surfaces I place the wood for both the bottom of the tub and the surfaces of the roll "end on," as will be hereinafter more particularly described.

The invention has further for its object to provide improved features of construction, which will be hereinafter fully set forth.

To the accomplishment of the foregoing and such other objects as may be made to appear, the invention consists in the construction and in the combination of parts hereinafter particularly described and then sought to be specifically defined by the claims, reference being had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a perspective of the mill, partly in vertical section. Fig. 2 is a side view of one of the rolls and part of another, and showing the hub partly in section. Fig. 3 is a plan view of the parts shown in Fig. 2 with parts in section. Fig. 4 is a perspective of a portion of one of the rolls, showing the manner of arranging the segmental wooden blocks forming the rolls; and Fig. 5 is a perspective of one of the metal end caps to the rolls. Fig. 6 is a sectional view through a portion of one roll and a portion of the bed or bottom of the tub, showing the relation of the grain in the wood of the two parts.

In the drawings, the numeral 1 designates the sides of the tub, which may be formed of staves or otherwise, and 2 designates the bottom of the tub, which is formed of a series of wooden blocks 3 set "end on" or crosswise of the grain of the wood.

The numeral 4 designates an upright rotatable shaft stepped at its lower end in a socket-bearing 5, and at its upper portion having a bearing in a suitable box 6, secured to a cross-timber 7, and provided at its upper end with a bevel gear-wheel 8, with which wheel meshes a bevel-pinion 9, secured to the end of a horizontal shaft 10, turning in suitable boxes 11, secured to the cross-timbers 12 and carrying at its outer end a belt or driving-pulley 13. The upright shaft 4 carries at its lower angular portion a hub 14, which is secured to the shaft by set-screws 15. This hub is formed at its opposite ends with vertical slots or ways 16, one of which slots or ways is in the end of the hub, so as to receive the square or angular end 17 of the shaft or axle 18, while the other two slots or ways 16 are in the opposite sides of the hub, so as to receive the pin 19, which passes through the angular portion of the shaft or axle 18. This construction allows an up-and-down movement or play of the shaft or axle 18 of the grinding-roll, so that the roll may jump or ride over any lumps of mica which may not have been ground sufficiently. The square or angular

end of the rolls, shaft, or axle 18 prevents the axle from turning, and the pin 19 prevents the axle from leaving its hub.

Each grinding-roll, of which two are illustrated, is composed of a series of wooden blocks 20, carried by the shaft or axle 18. These blocks are preferably made segmental in form, and are placed around the shaft or axle 18, so as to break joint one with the other, as illustrated. The blocks are made of wood and are cut across the grain, so that when assembled upon the shaft or axle they will be "end on"—that is, the grain will be crosswise of the roll—thus rendering the surface of the roll as hard as possible consistent with the employment of wood. The blocks are secured in place around the shaft or axle 18 by means of tie-rods or threaded bolts 21 passed through the blocks, and of which six are illustrated in the drawings. These rods or bolts also pass through metal caps 22 at opposite ends of the roll, and nuts 23 are applied to the threaded ends of the bolts, so as to clamp the wooden blocks and metal caps together. The metal caps will fit to and turn upon the axle 18 and serve as the bearing between the roll and its shaft or axle and will hold the blocks from contact with the axle and leave a space between them and the axle, as illustrated clearly in Fig. 3 of the drawings, and thus materially reduce the friction.

Collars 24 are placed around the shaft or axle 18 at the outer ends of the rolls and next to the caps 22 and are secured to the shafts by set-screws 25, so as to prevent the rolls from being thrown beyond said collars at their outer ends. A spider-arm 26 is passed into the hub 14 and secured thereto by a set-screw 27, and it serves as a leader for the straps designated by the numeral 28. The straps, which may be of metal, are preferably of four sections, as illustrated, the ends of the sections next to the inner ends of the grinding-rolls being secured to the ends of the spider-arms 26 by means of screw-bolts 29 in a manner to turn on said arms to form a hinged connection therewith, so as to permit the straps to rise and fall with the roll, the other ends being secured to the outer ends of the shafts or axles 18 by means of screw-bolts 30. These straps carry any desired number of diagonally-set scrapers 31, so as to throw the mica toward the middle of the tub or away from its side.

It will be observed that by having the grain of the wood composing the rolls and also the bed or bottom of the tub placed "end on" the fibers or grain of the two parts are brought end to end or in opposition to each other, so that there is less wear and tear and liability to injury to the surfaces of the roll and bed than when the grain of both the roll and bed is otherwise presented one to the other; furthermore, when the roll is rotated on its axis and at the same time moved around the bottom or bed of the tub, over the face thereof, the laminæ of the mica are separated and disintegrated in a manner and to an extent most satisfactory by reason of the torsional action thus produced, which action would tend soon to wear out the contacting surfaces of the roll and bed were not the grain of both arranged "end on," or end to end.

It has been found from actual use of this mill that it produces most satisfactory results in grinding the mica, and is durable and can be used a long time without repairs, and being simple in construction its parts can be readily replaced with others at little expense when necessary.

I have illustrated and described with particularity the preferred details of construction and arrangement of the several parts; but it is obvious that changes can be made therein without departing from the essential features of my invention.

Having described my invention and set forth its merits, what I claim is—

1. A mica mill comprising in its structure a tub having a fixed bottom formed of blocks of wood with the grain perpendicular to the surface of the bottom, a revoluble roll formed of a series of wooden blocks "end on," and means for moving said roll around the tub, whereby the mica is ground between the hard unyielding non-metallic surfaces, one of which is stationary and the other rotatable, and discoloration of the mica is prevented and its luster preserved, substantially as and for the purposes described.

2. A mica mill comprising in its structure a tub having a fixed bottom formed of blocks of wood with the grain perpendicular to the surface of the bottom, a revoluble roll formed of blocks of wood "end on," means for clamping together the blocks of the roll, a rotatable vertical shaft, a spider arm extending laterally from said shaft, means connecting the inner end of the roll with the vertical shaft, a strap connecting the outer end of the roll with the spider arm, and means for rotating the vertical shaft, substantially as and for the purposes described.

3. In a mica-mill, the combination with the tub, of the rotatable vertical shaft provided with a hub, spider arms projecting laterally from the hub, the rotatable grinding rolls, each formed of a series of wooden-blocks "end on," non-rotatable shafts for said rolls connected with the hub so as to have a vertical play, and straps connected at one end with the outer ends of the grinding rolls and at the other end having a hinged connection with the outer ends of the spider arms, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN GIFFORD SKELTON.

Witnesses:

L. M. WILLIAMS,

THOS. N. WILLIAMSON.