J. S. SORENSEN.

ROLLER MILL.

APPLICATION FILED APR. 26, 1913.

1,199,938.

Patented Oct. 3, 1916.

2 SHEETS—SHEET 1.

Fig. 1

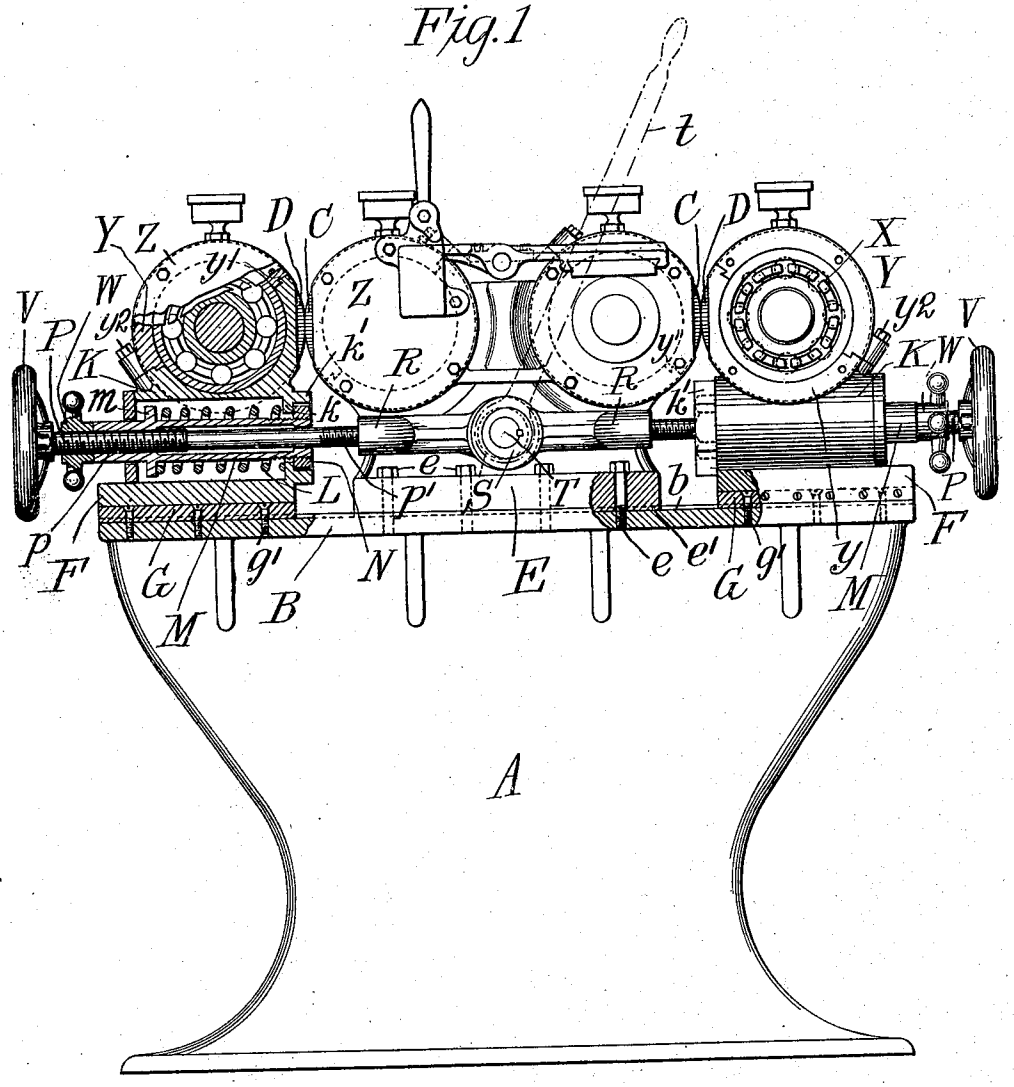
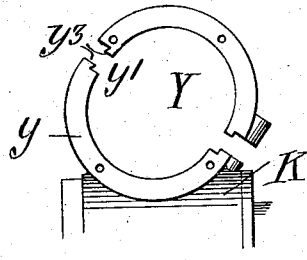


Fig. 5



Witnesses

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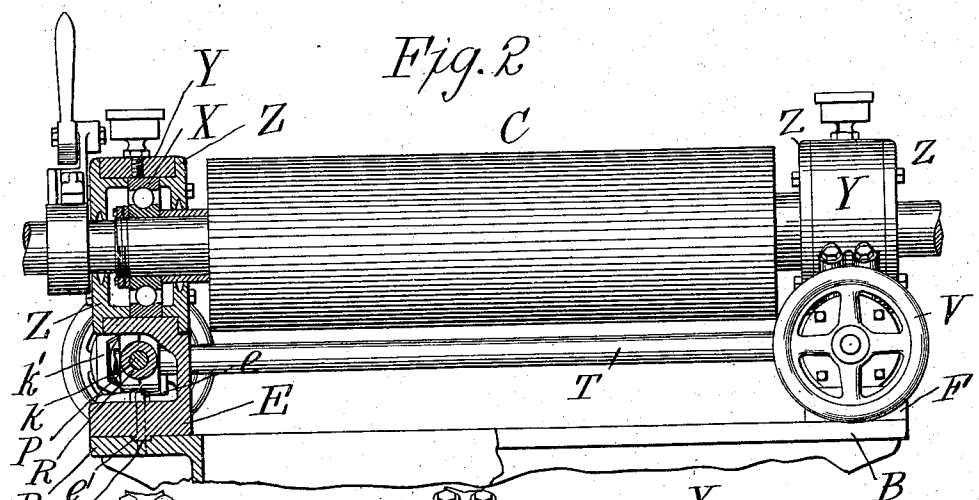
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2 SHEETS—SHEET 2.

Fig. 2



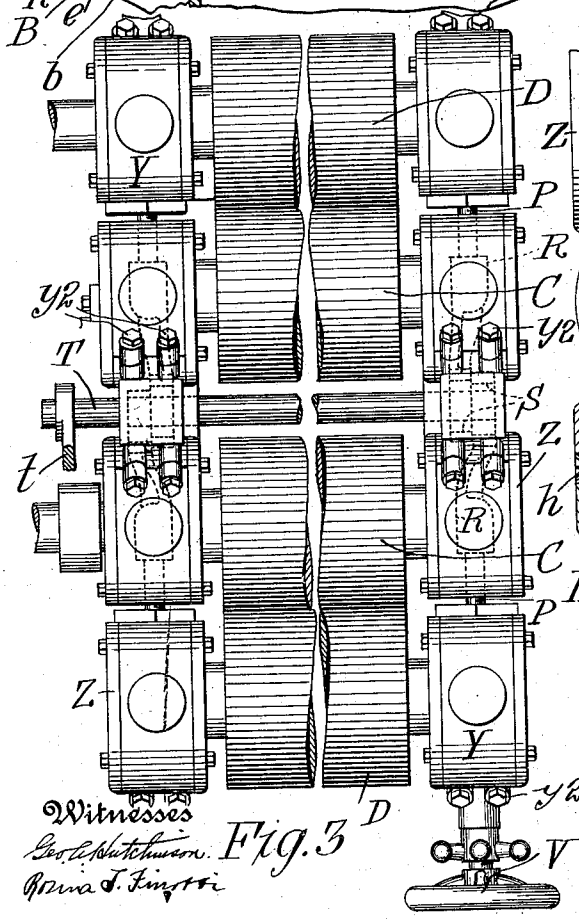


Fig. 3

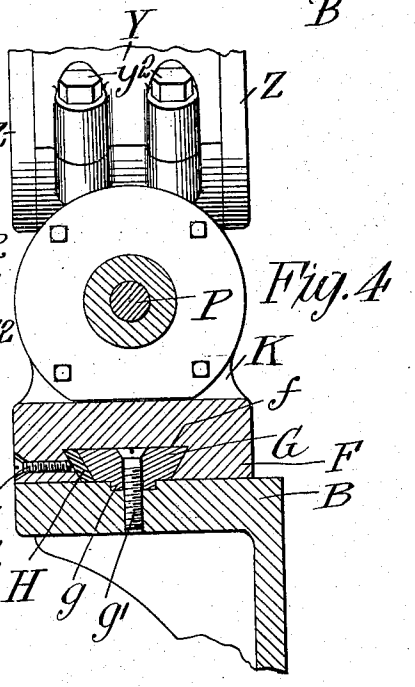


Fig. 4

Witnesses

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UNITED STATES PATENT OFFICE.

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ROLLER-MILL.

1,199,938. Specification of Letters Patent. Patented Oct. 3, 1916.

Application filed April 26, 1913. Serial No. 763,762.

To all whom it may concern:

Be it known that I, JOHN S. SORENSEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Roller-Mills; and I do hereby 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.

This invention relates to roller mills, and has for its objects to avoid the necessity of tramming for bringing the rolls into proper horizontal and endwise alinement, to simplify the adjustment of the rolls, to take up wear on the same, to insure the meeting of the rolls of each pair throughout their length in the plane of their axes, and to increase and improve the product of the mill.

In the operation of roller mills, the rolls often wear more on one end than the other. While tramming is not required for bringing the rolls into proper horizontal and endwise alinement in the present machine, it is necessary to take up this wear on the rolls in order that the mill may properly do its work. To insure the maximum capacity of the mill and highest quality of its product, the rolls of each pair should meet on a line located in the plane determined by the axes of said rolls. It follows that the adjustment of the rolls should be restricted to the plane of their axes which is ordinarily a horizontal plane. In the present improvement, the end bearings of the rolls are carried in supports which are fixed against endwise or up and down play, so that tramming in those directions is not required, but said supports may be readily adjusted horizontally, so as to move said rolls in the plane of their axes, whereby their peripheries may be brought together in said plane. The housings for said end bearings are made in two parts to permit the introduction and removal of the bearings, as will be understood. These supplemental parts of the housings have heretofore been secured together by bolts at both joints. In view of the fact that the housings are arranged above their supports and in order to locate the connecting bolts where they will be out of the way as much as possible when the rolls are to be drawn together, said housings are preferably divided on an incline, as illustrated, but even then the bolts interfere to some extent with this adjustment. In order to overcome this objection, the present improvement contemplates dispensing with the bolts at the joints on the confronting portions of the casings for each pair of rolls and providing instead interlocking connections on the supplemental parts of the casings themselves, said interlocking connections being of such a nature as not to interfere at all with the movement of the rolls toward one another to take up wear.

The invention will be hereinafter first fully described with reference to the accompanying drawings, which constitute a part of this specification, and then more particularly pointed out in the claims appended to the description.

In the drawings, Figure 1 is a broken end elevation of a roller mill embodying the present invention, the hopper or casing for the rolls being omitted; Fig. 2 is a broken side elevation, the support and bearing for one of the non-adjustable rolls being shown in section; Fig. 3 is a broken plan view of the mill as shown in Fig. 1; Fig. 4 is an enlarged section through the sliding dovetail connection between one of the adjustable roller bearing supports and the bed plate, and Fig. 5 is a detail of the interlocking joint between supplemental parts of one of the bearing casings.

Referring to the drawings by letters of reference, A denotes the framework or supporting pedestal for the bed-plate B, upon which are mounted the end bearings or journals for the rolls. In the embodiment of the invention illustrated, two pairs of rolls are shown, the inner rolls C being non-adjustable and outer rolls D being capable of adjustment to and from the rolls C for taking up wear. Said inner rolls C may be journaled in a common support E at each end, whereas said outer adjustable rolls have their bearings in separate supports F. While the rolls are shown with plain peripheries, it will be understood that in practice they may be corrugated or roughened to suit requirements.

The supports E are securely fastened to the bed-plate by bolts *e* or otherwise, and are fixed so as to prevent endwise movement of their rolls, preferably by forming tongues e^1 on their under surfaces and fitting said tongues in corresponding grooves *b* in the bed-plate, as shown best in Fig. 2.

Said grooves may extend the full width of the bed-plate, and in the end portions thereof there may be fitted tongues g on dove-tail pieces G which are also securely fastened to the bed-plate, as by bolts g^1, whereby said dove-tail pieces G, which in effect form dove-tail tongues on the bed-plate B, are fixed against lateral movement.

The supports F are provided with dove-tail grooves f in their under surfaces to engage the dove-tail pieces or tongues G, as best illustrated in Fig. 4. These dove-tail grooves are made somewhat wider than the tongues formed by said dove-tail pieces, and the spaces at the outside edges of said tongues are filled by wear strips H which are adjusted and retained in close contact with said tongues by set screws or bolts h or other suitable means.

Each of the supports F has, preferably integral therewith, a box or shell K inclosing a coiled spring L, such as ordinarily used for maintaining a yielding pressure between the grinding-surfaces to allow obstructions to pass through them without injuring the connecting parts. Said spring surrounds a sleeve M, being interposed between a projection or flange m on and near the outer end of the sleeve and an internal projection or flange k on and near the inner end of the box or shell. At its inner end the sleeve is exteriorly threaded and screws into a fixed or non-rotatable nut N located at the inner side of the flange or projection k, which nut may be fitted in a suitably-shaped part k^1 of the box to prevent its rotation, as illustrated on the left hand box in Fig. 1.

The supports F may be adjusted or moved longitudinally on the dove-tail pieces G by rods P which pass through the sleeves M, each of which is preferably chambered out except for a suitable length at its outer end where it is bored and internally threaded to receive a correspondingly threaded part p of its closed rod. The inner ends of the rods are also threaded, as at p^1 with threads of less or different pitch than those of the outer threaded parts p, and in the present embodiment of the invention said inner ends are screwed into castings R mounted on eccentrics S on a shaft T (see Fig. 3), said shaft having a handle or lever t for rocking it to shift the rods and thereby open and close the rolls. However, other arrangements may be adopted, as well as other forms of shifting devices to which the adjusting rods may be provided at their outer ends with hand-wheels V or other suitable devices for turning them, and lock-nuts W, preferably of the wing type, may be secured on the outer threaded parts p of the rods.

The adjustment of the rolls D to take up wear is accomplished by loosening the lock nuts W and rotating the rods P by means of their hand-wheels V. Because of the fact, as before stated, that the threads on the outer and inner ends of the rods P are of different pitch, those on the outer ends being preferably of greater pitch, turning of the rod will cause it to advance or withdraw different distances in its sleeve M and casting R, with the result that said sleeve is moved oppositely to the longitudinal movement of the rod a distance equal to the difference between the relative movements of said rod in said sleeve and casting. By this means exceedingly fine and delicate adjustments of the rolls may be effected, the supports F carrying said adjustable rolls being moved on the dove-tail pieces secured to the bed-plate under the influence of the adjusting rods. The springs L may be properly tensioned by turning the sleeves M in their non-rotatable nuts N.

The grinding rolls are shown as journaled in ball-bearings X arranged in housings Y which surround said ball-bearings, the lateral faces of the latter being closed by plates Z. Each of the housings Y is made in two parts to permit the assembling of the bearings and rolls after the supports E and F, carrying said housings, have been placed in position on the bed-plate. One part y of each housing is preferably cast integral with its support, as shown. The two parts are connected together on the confronting sides of each pair of rolls by an interlocking joint y^1, and by bolts y^2 on the other sides. Said interlocking joint comprises overlapping or stepped portions on the two parts of the housing, the overlapping surfaces y^3 being constructed so as to interlock.

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

1. A supporting bearing for the shaft of a grinding roll comprising two substantially semi-circular members connected together by interlocking connections on the confronting parts of said members and adapted to be separated by radial movement of one of said members.

2. A supporting bearing for the shaft of a grinding roll comprising two substantially semi-circular parts connected together by interlocking connections consisting of overlapping portions on said parts having inclined inter-engaging surfaces and adapted to be separated by radial movement of one of said parts.

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

JOHN S. SORENSEN.

Witnesses:
MARSHALL G. STEVENS,
NORMAN H. STEVENS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."