Oct. 8, 1929. A. VOEGEL 1,730,906

ROLLER MILL

Filed Sept. 30, 1926

Fig. 1

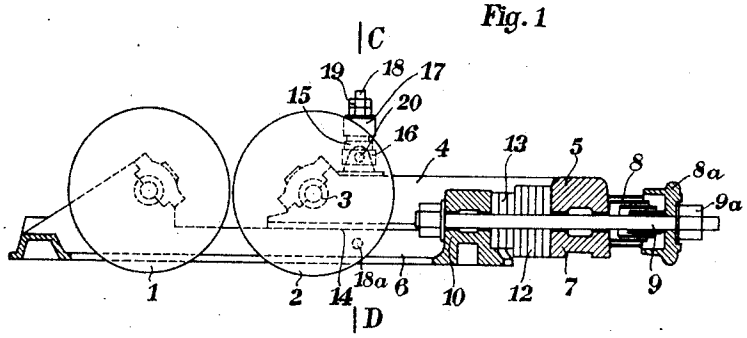
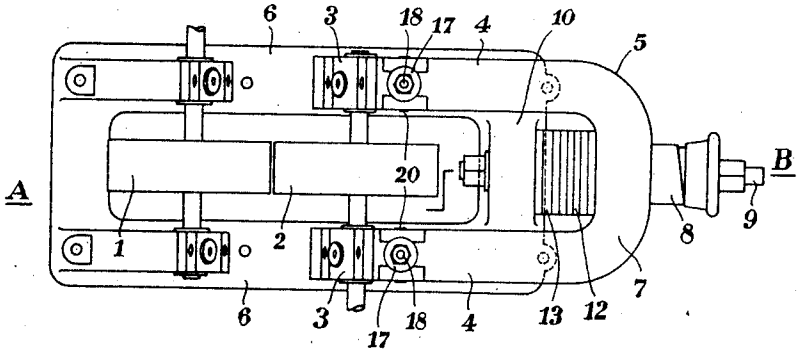


Fig. 2



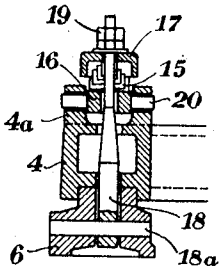


Fig. 3

Inventor
August Voegel
By Kingsbury
Atty.

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UNITED STATES PATENT OFFICE

AUGUST VOEGEL, OF MAGDEBURG, GERMANY, ASSIGNOR TO THE FIRM FRIED. KRUPP GRUSONWERK AKTIENGESELLSCHAFT, OF MAGDEBURG-BUCKAU, GERMANY

ROLLER MILL

Application filed September 30, 1926, Serial No. 138,732, and in Germany October 2, 1925.

My invention relates to roller mills, representing crushing, grinding, squeezing and comminuting machines capable of general application but preferably being used for reducing hard substances like ores, minerals and the like into fine particles.

My invention has special reference to that type of roller mills, comprising a set of crushing rolls of which one is movably i. e. yieldingly mounted on the frame of the mill and is resiliently held in its operative position relatively to the stationarily mounted roller or rollers, so as to permit the occasional passage of foreign substances, such as broken mining tools, bolts, nuts and the like.

The object of my invention is to provide simple durable and efficient means for yieldingly carrying the movable roll, and for speedily adjusting and properly guiding the latter and its carrier respectively. Another object aimed at by this invention is to completely eliminate those drawbacks commonly attached to mills of the type under discussion: Said drawbacks, as known to those familiar with the working of said mills comprise the displacement occurring at the crushing rollers, which as the result of uneven strains wear and tear tend to take up a diverging position, i. e. obliquely to each other, secondly the difficulties and impediments, offering themselves in changing or readjusting the distance between the main rolls, i. e. the space between their circumferential working surfaces, and—last not least—the heavy vibrations and shocks, imparted to the whole frame work of the mill as the result of unequal strains on the rolls and uneven wear of the members for guiding the yielding roll in its reciprocative movements during the crushing operation.

The nature and scope of my invention are briefly outlined in the appended claims and will be more fully understood by the following specification taken together with the accompanying drawing, in which an embodiment of my invention is shown by way of an example and of which—

Fig. 1 is a side elevation, partly in section, taken on line A—B of Fig. 2;

Fig. 2 is a plan view;

Fig. 3 is a transverse section, taken on line C—D in Fig. 1.

As indicated in Figs. 1 and 2, the roll 1 is mounted in rigid brackets of the main frame 6. The roll 2 is mounted in bearings 3 of an auxiliary U-shaped frame 4, 5, which is carried on guide portions 14 of the main frame and is yieldingly secured thereto by means of a screw bolt 9. The latter extends through a bracket 10 of the frame 6 and through the central portion 7 of the U-frame, which yieldingly is held in its position by a spring 8, a cap 8^a and nut 9^a at its rear side and at the inner side by a series of insertion plates 12, mounted on the bolt 9. Said insertion plates are designed in any convenient manner known per se in the art, so as to be easily exchangeable and thus permit the width of the gap between the rolls 1 and 2 to be varied. Discs 13 of elastic material e. g. of india rubber may be also interposed between the bracket 10 of the main frame and the central portion 7 of the auxiliary frame, in order to take up the heavy shocks occurring at the return movements of the roll 2 into its initial position, after it has yielded for the passage of obstructing material.

In order to hold the arms 4 constantly against the gliding surface 14 of the frame, even when the surfaces wear away unequally, and thereby to prevent harmful chattering, a pressure spring 15 (Fig. 3) is mounted on each arm 4. The spring rests upon a collar 16 and presses upward against a cap 17, which is held in place by the nut 19 of bolt 18. The screw bolt 18 is pivoted at 18^a on the main frame and extends through the annular member 16, which is supported by journals 20, the latter being mounted in brackets 4^a, provided on the frame 4 as indicated in Fig. 3, and adapted to swing about the journals 20 parallel to the axis of the rolls.

Thus the springs 15 will always be automatically adjusted and will be kept in their normal position relative to the annular member 16 during the yielding movements of the roll 2 and the U-shaped frame respectively.

Various changes may offer themselves to those skilled in the art as to the design and the cooperation of the component parts of the

mill, e. g. of the means for yieldingly securing the roll 2 in its operation, described hereinbefore without substantially departing from the spirit and the leading ideas of my invention.

What I claim is:

1. A roller mill comprising a main frame, a crushing roll stationarily mounted on said main frame, a yoke slidably mounted on said main frame, a second crushing roll on said yoke, an abutment on said main frame between the cross piece of said yoke and said second crushing roll, insertion plates interposed between said cross piece and said abutment for regulating the least distance between said rolls, and yieldable means opposing movement of said second roll away from said first mentioned roll.

2. A roller mill comprising a main frame, a crushing roll stationarily mounted on said main frame, a yoke slidably mounted on said main frame, a second crushing roll on said yoke, an abutment on said main frame between the cross piece of said yoke and said second crushing roll, a resilient buffer interposed between said cross piece and said abutment for limiting the movement of said second roll toward said first mentioned roll, and yieldable means opposing movement of said second roll away from said first mentioned roll.

3. A roller mill comprising a main frame, a crushing roll stationarily mounted on said main frame, a yoke slidably mounted on said main frame, a second crushing roll on said yoke, an abutment on said main frame between the cross piece of said yoke and said second crushing roll, a bolt secured to said abutment and slidably extending through said cross piece, a cap on the outer end of said bolt, resilient means mounted on said bolt between said cap and said cross piece for opposing movement of said second roll away from said first mentioned roll, and insertion plates and a resilient buffer mounted on said bolt between said cross piece and said abutment for limiting movement of said second roll toward said first mentioned roll.

4. A roller mill comprising a main frame having spaced guide portions, a crushing roll stationarily mounted on said frame, a yoke having two arms resting on said guide portions, a second crushing roll mounted on said yoke, yieldable means opposing motion of said second roll away from said first mentioned roll, and a pressure element associated with each arm of said yoke for maintaining the same in contact with their respective guide portions.

5. A roller mill in accordance with claim 4 in which each of said pressure elements comprises a bolt pivoted to the guide portion of the main frame and extending through the arm of the yoke, a cap on the end of said bolt, a plate horizontally pivoted on said arm at its upper side and surrounding said bolt, and a resilient member inserted between said cap and said plate.

The foregoing specification signed at Berlin, Germany, this 14th day of September, 1926.

AUGUST VOEGEL.