A. A. K. NOWAK.

ROLLING MILL.

APPLICATION FILED MAY 16, 1911.

1,024,485. Patented Apr. 23, 1912.

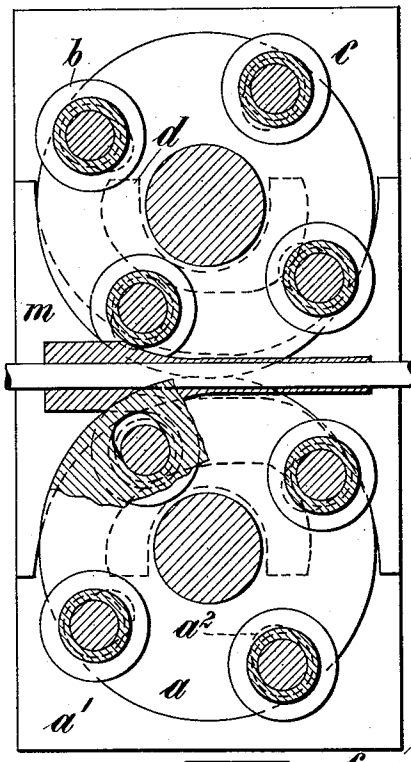

Fig.1.

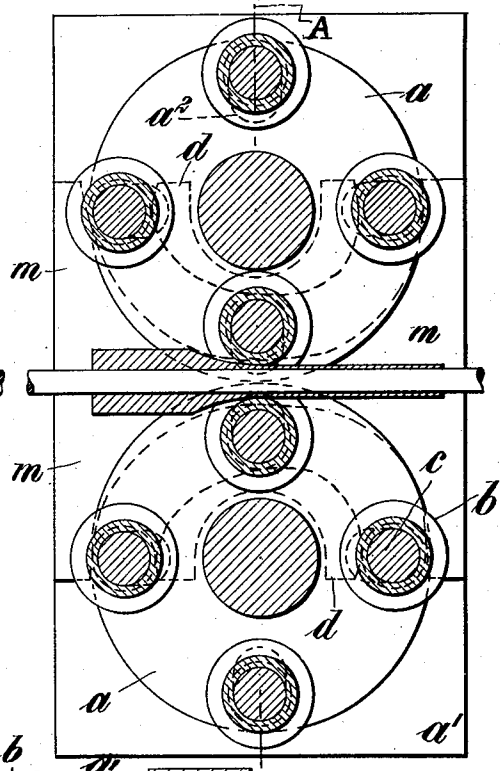

Fig.2.

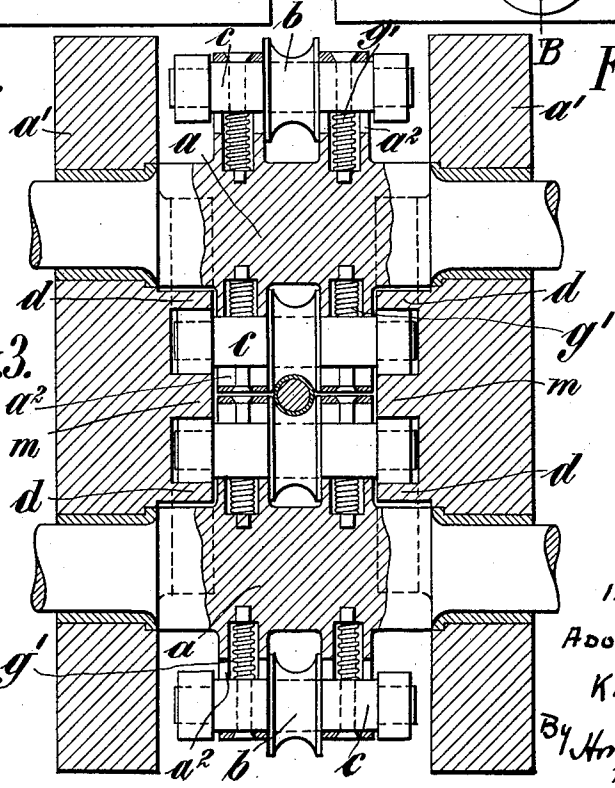

Fig.3.

WITNESSES

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UNITED STATES PATENT OFFICE.

ADOLF ALEXANDER KARL NOWAK, OF BOUS-ON-THE-SAAR, GERMANY.

ROLLING-MILL.

1,024,485. Specification of Letters Patent. Patented Apr. 23, 1912.

Original application filed April 21, 1910, Serial No. 556,831. Divided and this application filed May 16, 1911. Serial No. 627,541.

To all whom it may concern:

Be it known that I, ADOLF ALEXANDER KARL NOWAK, a subject of the Emperor of Austria-Hungary, and residing at Bous-on-the-Saar, Germany, have invented a certain new and Improved Rolling-Mill, of which the following is a specification.

My invention relates to rolling mills and particularly to mills of the planetary roll type, the object of my invention being to improve the same in the particulars hereinafter pointed out.

The present application is a division of my copending application Serial No. 556,831, filed April 21, 1910.

In rolling mills of the type to which this invention relates, it has been proposed by me to arrange the rolls in radial bearing slots in the roll carrier, the roll bearings being subjected to inwardly directed pressure from springs and being forced outward against the action of these springs during the working portion of the travel of the rolls by stationary gudies mounted on the frame of the mill. This arrangement however does not altogether prevent the injurious shocks which occur not only when the rolls strike the stationary guides, but also when they leave the latter and are thrust down into the bottoms of the bearing slots by the expanding springs. On each revolution of the carrier as many shocks occur as there are rolls mounted thereon, viz., four times on each revolution, in the mill shown. Inasmuch as the mill is rapidly driven, that is, at the rate of approximately three hundred revolutions a minute, a great number of these shocks are caused, which tend to injure not only the gearing and the roll axles, but also the roll carriers, the guides and the frame of the mill. These shocks are avoided according to the present invention, by arranging outer guides as well as inner guides. Through the coöperation of these outer and inner guides the shocks which occur when the rolls impinge upon and also when they leave the guides (through the thrust of the roll bearings down into the bottom of their guide slots by the bearing springs) in the form of mill mentioned, are entirely avoided.

In the accompanying drawings, Figures 1 and 2 are vertical longitudinal sections through a rolling mill in which my invention is illustrated in one form, the rolls being shown in different positions; and Fig. 3 is a vertical section on the line A—B, Fig. 2.

Referring to the drawings, I mount in the usual manner upon the frame a^1 of the mill the roll carriers a in the radial slots a^2 of which the axles c, of the rolls b, have their bearing. The outer and inner guides, m and d respectively, which are rigidly secured to (or formed in one with) the mill frame, are so formed and arranged as to lead the axles c of the rolls b without shock through the working portion of their travel. While in the earlier form of mill referred to, springs are employed to press the rolls inwardly, in the present arrangement with the coöperating inner and outer guides, I employ only the springs g^1 which tend to press the rolls radially outward, thus reinforcing the centrifugal action which takes place during the operation of the mill. By reason of this arrangement the rolls which are out of contact with the blank and guides—(that is the temporarily non-working rolls), are forced to the outer extremity of their bearing slots, as shown in Figs. 1 and 2. As the roll enters between the guides m and d (Fig. 2), it meets the incline of the outer guide m and is gradually and without shock forced radially inward against the inner guide d to the point at which the blank is attacked by the roll. At the end of its working travel the roll has been forced out to the end of its bearing slot by the inner guide d, in which position it is maintained by the springs g^1 and (during operation) by centrifugal force.

The guides m and d are so shaped that the rolls meet and leave them with the least possible shock. Obviously the precise form illustrated may be varied within the scope of the claims without departing from my invention and I do not limit myself to the form shown.

I claim as my invention:—

1. In a rolling mill of the character described, a rotatable roll carrier, rolls displaceably mounted thereon, and guides spaced radially apart with relation to the roll carrier axis and arranged to engage the roll spindles between the juxtaposed faces of said guides during the working portion of the stroke of the rolls.

2. In a rolling mill of the character described, a rotatable roll carrier, rolls displaceably mounted thereon, and guides

spaced radially apart with relation to the roll carrier axis and arranged to engage the roll spindles between the juxtaposed faces of said guides during the working portion of the stroke of the rolls, said outer guide being arranged to meet said roll spindle at the approach to its working travel and lead it inward to the inner guide.

3. In a rolling mill of the character described, a rotatable roll carrier, rolls displaceably mounted thereon, and guides spaced radially apart with relation to the roll carrier axis and arranged to engage the roll spindles between the juxtaposed faces of said guides during the working portion of the stroke of the rolls, said outer guide being arranged to meet said roll spindle at the approach to its working travel and lead it inward to the inner guide, and said inner guide being shaped to force said roll outward toward the end of its working travel to its extreme outer position, whereby shock incident to the meeting and leaving of said guides by the roll is minimized, substantially as described.

4. In a rolling mill of the character described, a frame, a roll carrier rotatable therein, rolls displaceably mounted in said carrier, and roll guides arranged directly on said frame and spaced apart to embrace the roll spindles during the working portion of the stroke of the rolls.

5. In a rolling mill of the character described, a frame, a roll carrier rotatable therein, rolls displaceably mounted in said carrier, and roll guides arranged directly on said frame and spaced apart to embrace the roll spindles during the working portion of the stroke of the rolls, said guides being shaped to displace said rolls inward on the carrier to the working portion of their strokes, determine the working travel thereof and then lead said rolls outward on said carrier, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

ADOLF ALEXANDER KARL NOWAK.

Witnesses:
M. BRUXMEIER,
T. FISCHER.