

A. GAUTSCHI.
ROLLING MILL.
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977,725.

Patented Dec. 6, 1910.

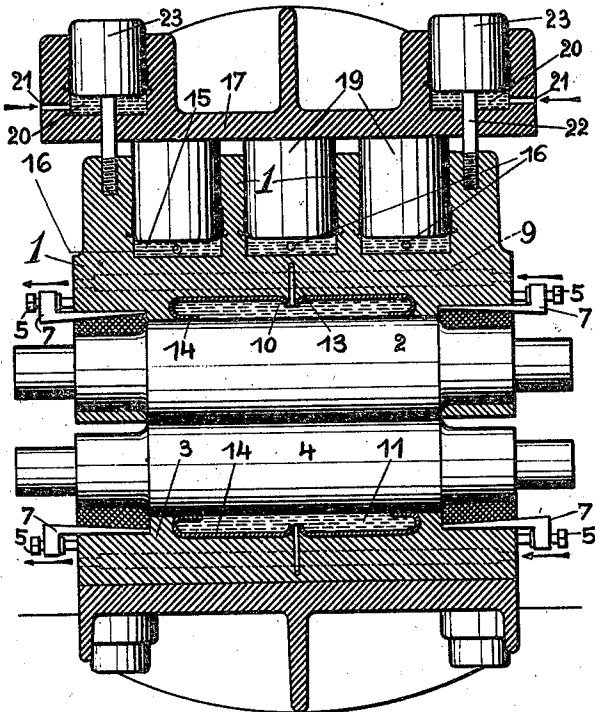


Fig. 1

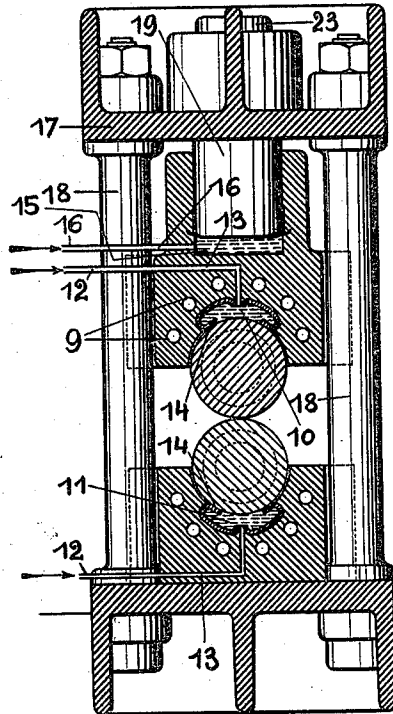
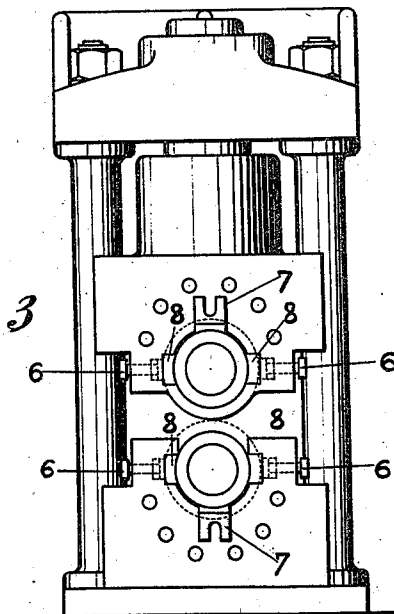


Fig. 2

Fig. 3



WITNESSES

John G. Kreival
Wm. Jones

INVENTOR

Alfred Gautschi
By M. D. White

Att'y

UNITED STATES PATENT OFFICE.

ALFRED GAUTSCHI, OF MENZIKEN, SWITZERLAND, ASSIGNOR TO ALUMINIUMWAREN-FABRIK GONTENSCHWIL AKTIENGESSELLSCHAFT, OF GONTENSCHWIL, SWITZERLAND.

ROLLING-MILL.

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To all whom it may concern:

Be it known that I, ALFRED GAUTSCHI, a citizen of the Republic of Switzerland, residing at Menziken, in the Canton of Aargau, Republic of Switzerland, (whose post-office address is Menziken,) have invented certain new and useful Improvements in and Relating to Rolling-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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to rolling mills.

In order to obviate bending of the working rolls in such mills, it has hitherto been the practice to employ pressure or supporting rollers, acting upon the rolls. This method, however, is attended with the drawback that there is a liability that by the pressure of the supporting rollers, or through foreign bodies making their way in between same and the working rolls, impressions are produced in the working rolls and the quality of the material treated in the mill is thereby depreciated. Moreover, a good deal of power is lost through the friction set up between the pressure rollers and the working rolls.

According to the present invention, pressure rollers with their attendant drawbacks are avoided by allowing a fluid or gaseous medium of pressure to act directly on the rounded surface of the working rolls.

A typical method of carrying out this invention with a fluid pressure medium is illustrated in the drawing; Figures 1 and 2 representing two sections at right angles to one another, and Fig. 3 a side elevation.

1 is the top roll bearing, with the top roll 2, and 3 is the bottom roll bearing with the bottom roll 4. The rolls 2 and 4 are set in the vertical and horizontal positions by means of wedges 7 and blocks 8, operated by screws 5 and 6. Channels 9 admit a cooling or heating liquid to the roll bearings. At the highest part of the top roll bearing, and at the lowest part of the bottom roll bearing, are provided pressure chambers 10 and 11 respectively, for the reception of a fluid pressure medium, for instance oil, the said chambers extending over a certain portion

of the periphery of the rolls. These pressure chambers are connected by means of the pipes 12 and passages 13, with a source of pressure, by means of which the rolls can be subjected to the requisite pressure. The pressure fluid is prevented from escaping out of the pressure chambers 10 and 11 by means of suitable packing 14.

It is now easily apparent that in this rolling mill a direct application of hydraulic pressure to the working surface of the rolls is effected, whereby the bending of the rolls is prevented, and a product (plates or sheets) is obtained that is uniform over the whole width of the rolls.

In order to enable the top roll bearing 1 to be pressed against the top roll by hydraulic pressure, and to obtain a large feed aperture without the packing 14 being compelled to stretch unduly, a hydraulic pressure device is provided which enables the top roll bearing 1 to be raised and lowered. With this object three pressure chambers 15 are provided in the upper portion of the top roll bearing 1, which chambers are connected with a source of hydraulic pressure by means of pipes 16. Pistons 19 mounted on the top traverse 17 of the mill housing 18, fit into the pressure chambers 15, and serve as firm abutments. Two other pressure chambers 20 are provided in the traverse 17 of the housing 18, and are also connected, by means of channels 21, with a source of hydraulic pressure. Pistons 23, connected with the top roll bearing 1 by rods 22, are provided in these chambers. By means of this device the top roll bearing and the roll 2 can be adjusted vertically, so as to make the feed aperture larger or smaller. The working surfaces of the rolls are now in contact with the hydraulic pressure medium and the packing, but not with the remaining portions of the roll bearing, so that all injury to the highly polished surface of the rolls by any portion of the bearing is prevented.

In consequence of the lubrication of the working surface of the rolls by the fluid pressure medium, the friction is greatly diminished. The pressure of the pressure medium on the working rolls is very uniform. According as a heating or cooling medium is admitted through the pipes 9, the pressure medium, and with it the corresponding working roll, is warmed or cooled.

In cases where the plates to be rolled are not more than $1\frac{1}{2}$ millimeters ($\frac{1}{16}$ th inch) thick, the hydraulic regulating devices 15, 16, 19 and 20, 22 and 23 may be omitted.

5 The means for packing the pressure chambers 10 and 11 may be of any suitable kind. A gaseous pressure medium may also be employed in place of a fluid medium.

What I claim is:—

10 1. A rolling mill, comprising in combination, a top roll bearing, a top roll, a bottom roll bearing, a bottom roll, pressure chambers provided in the said top and bottom roll bearings for the reception of a pressure medium, the said chambers extending
15 over a certain portion of the periphery of the rolls and being connected with a source of pressure.

2. A rolling mill, comprising in combination, a top roll bearing, a top roll, a bottom roll bearing, a bottom roll, pressure chambers provided in the said top and bottom roll bearings for the reception of a pressure medium, the said chambers extending over a certain portion of the periphery of the rolls and being connected with a source of pressure, and means for subjecting the top roller bearing to fluid pressure. 20 25

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses. 30

ALFRED GAUTSCHI.

Witnesses:

HERMANN HUBER,
CARL GUBLER.