

Dec. 26, 1944.

A. MOGILJANSKIJ

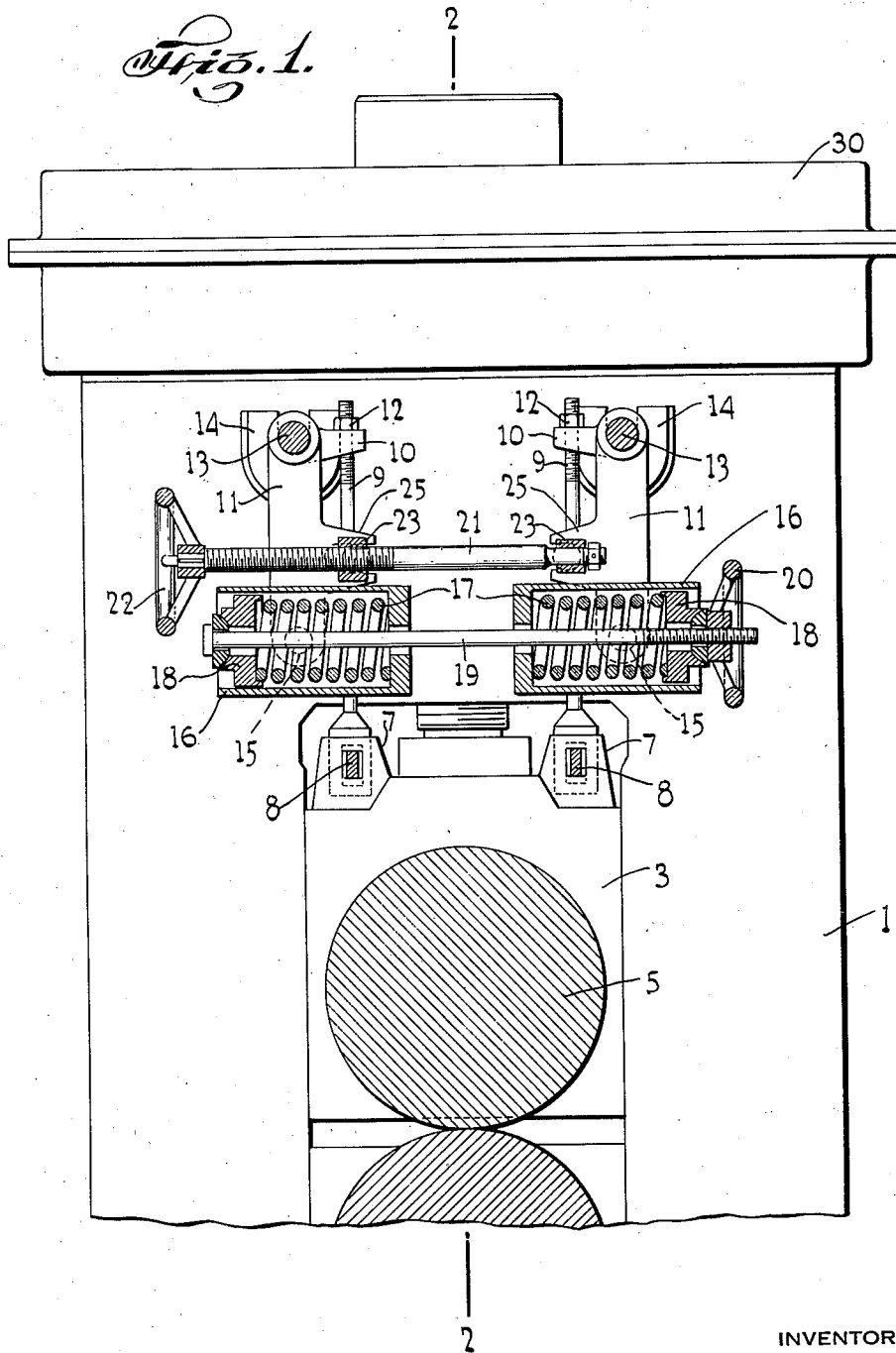
2,365,831

SUSPENSION OF ROLLING MILL ROLLS

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Fig. 1.



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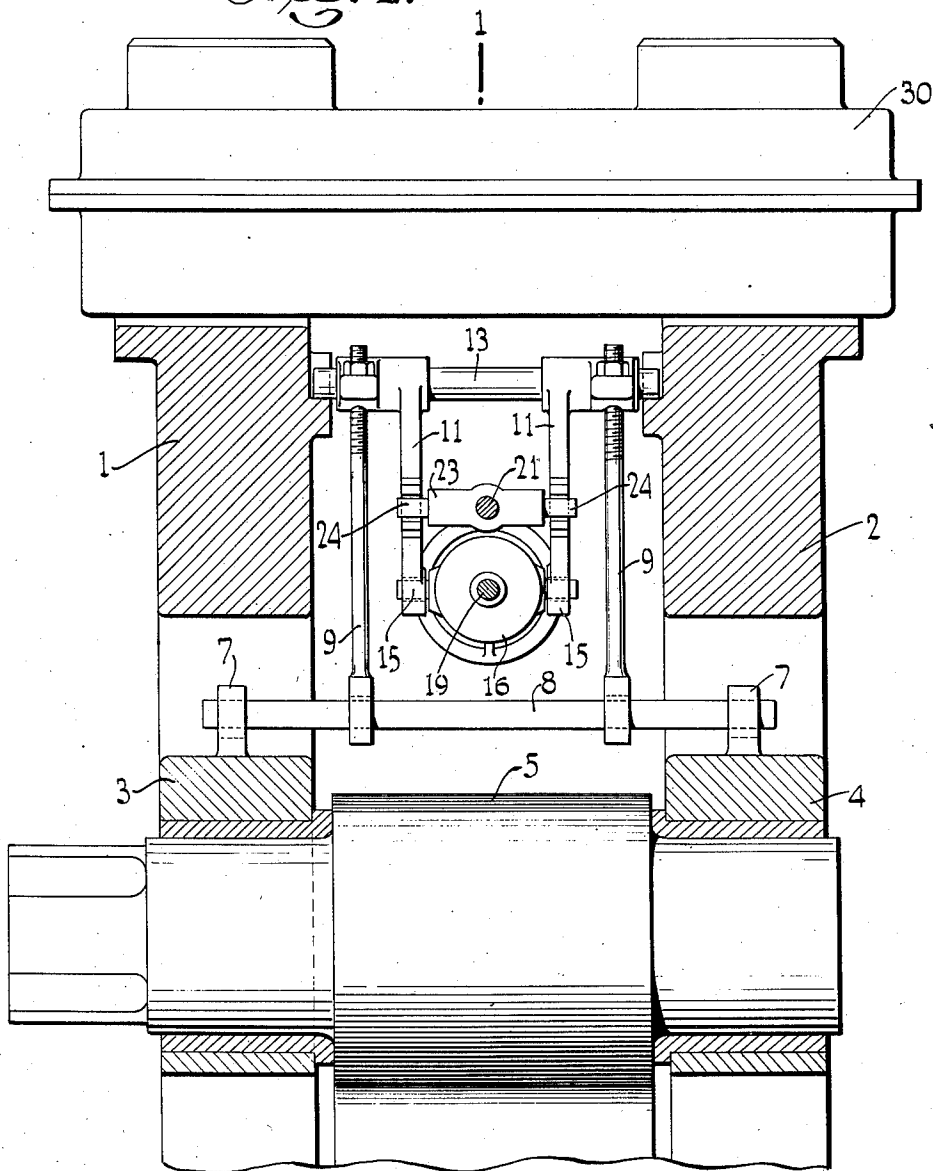
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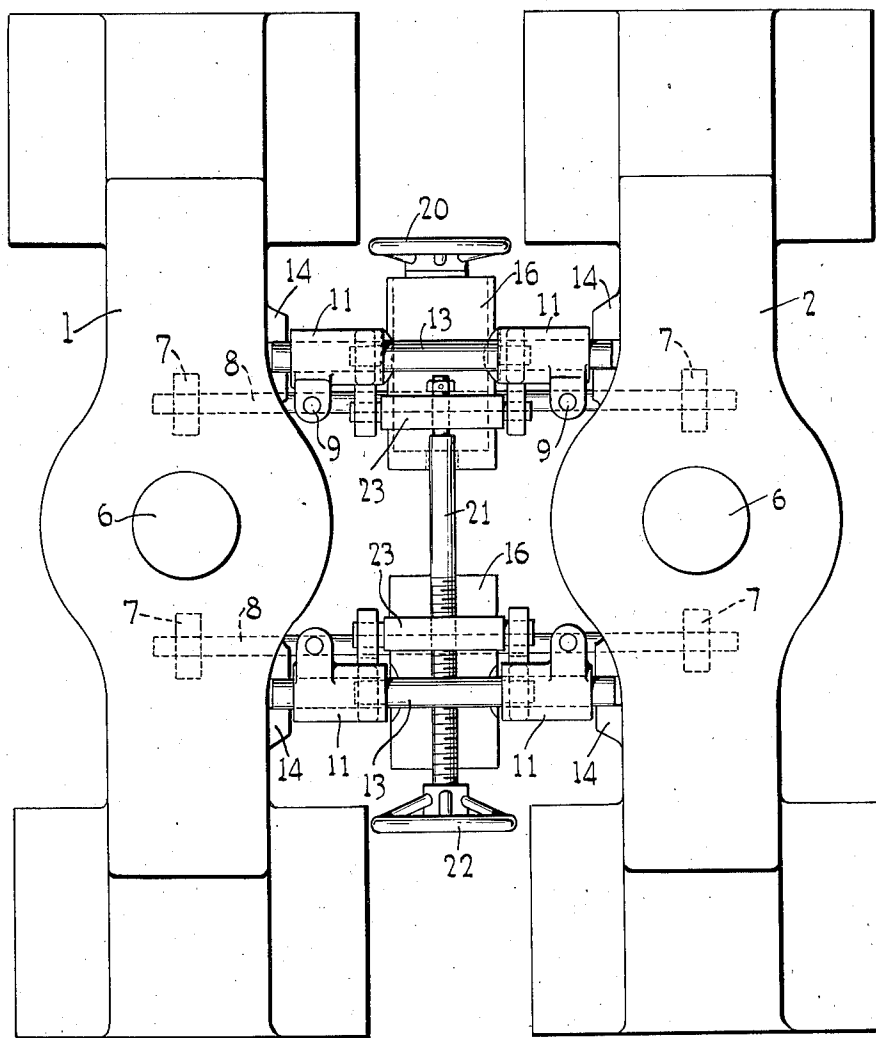
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Fig. 3.



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SUSPENSION OF ROLLING MILL ROLLS

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 Limited, London, England, a corporation of
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6 Claims. (Cl. 80—55)

This invention refers to the suspension of the top rolls of rolling mills and in particular to such rolls having a short lift as is the case with cold rolling mills and some types of hot mills.

The suspension of the top rolls with their chocks is generally carried out in such a way that the suspension means can follow the movement of the screwdown spindles of the roll chocks and that, further, any clearance between those spindles and their nuts is eliminated, in order to prevent jumping of the rolls when a piece of material is being fed to them. For this purpose, adjustable resilient members, which usually take the form of springs, form part of the top roll suspension, the springs acting on rods which are anchored to the mill housings and to which the roll chocks are attached.

It is the main object of the invention to centralise the suspension means for the top roll of a rolling mill, so that their adjustment can be effected from one point only. In this way, the adjustment is simplified to a great extent and can be carried out more quickly than was formerly possible.

A further object of the invention is to provide a suspension which will equalise the pulls exerted on all suspension points of the chocks, in order to avoid any tilting and jamming of the latter.

It is a further object of the invention to provide a mechanism of the above type which is so located inside the rolling mill stand that it does not take up any additional space and which, furthermore, permits the use of springs of unlimited size.

It is a still further object of the invention to provide a mechanism of the kind described which can be easily and quickly detached from the roll chocks, thus saving time when changing the rolls.

In the following, a characteristic example of the invention will be described in detail with reference to the drawings. It is, however, to be understood that the invention is not limited to this specific example and that it can be carried out in a number of different ways.

In the drawings, Fig. 1 is a sectional side elevation along the line I—I, Fig. 2, showing the top part of the rolling mill stand equipped with the suspension mechanism according to the invention, Fig. 2 is a sectional elevation along the line II—II of Fig. 1 and Fig. 3 is a top plan view.

The frame of the rolling mill shown in the drawings consists of the two housings 1 and 2 with chocks 3 and 4 to support the top roll 5. The bottom roll of the mill is not represented here as it is not necessary for the understanding of

the invention. Means are provided for vertically adjusting the chocks 3, 4, and thereby the top roll 5, in the form of screw-downs, of which only the threaded spindles 6 are shown here, the spindles being adapted to be lowered and raised through their rotation in any conventional manner by means of apparatus enclosed in the two-part cover 30.

The mechanism for suspending the top roll 5 with which the invention is concerned will now be described in detail.

Each of the roll chocks 3 and 4 has two spaced-apart cast-on eyes 7, through which crossbars 8 are passed, so that one crossbar connects the two oppositely arranged eyes of the two chocks, as shown in Fig. 3. Each crossbar 8 is engaged between its ends by two rods 9, making four rods in all. The rods 9 are adjustably suspended from parts 10 of bellcrank levers 11 by means of nuts 12. The levers 11 are pivoted on shafts 13 which are supported in open bearings 14, cast on to the insides of the housings 1 and 2 (Fig. 2.) Hinged to the bottom ends of the two oppositely arranged bell crank levers 11 by means of pivot pins 15 are casings 16 in which coiled springs 17 are housed. The springs 17 abut with their ends against end walls of the casings 16 and with their outer ends against movable discs 18. The two discs 18 can be drawn inwards and the springs 17 thereby tensioned by means of a pull rod 19 and the hand-wheel 20 which has a threaded connection with this rod. By operating the hand-wheel 20, both springs will be adjusted at the same time so that the entire suspension mechanism can be adjusted in one single operation.

The whole design is symmetrically arranged in order to divide the tension equally between all suspension points.

In order to relieve the mechanism from the tension of the springs when changing the rolls, without having to interfere with the adjustment of the springs themselves, means are provided for spreading the levers 11 apart. These means consist of a spindle 21 with a hand-wheel 22, the spindle having a threaded connection with one of two bridge pieces 23 which engage levers 11 by means of pivots 24 located in slots of brackets 25 on levers 11.

Rotation of hand-wheel 22 will move the levers 11 apart and therefore lower the rods 9 and accordingly the chocks 3 and 4. The movement of chocks 3 and 4 will stop when either the roll 5 touches the lower roll, or the chocks 3 and 4 come to rest on the lower chocks. The further lowering of rods 9 then relieves crossbars 8 from

the tension so that they can be easily pulled out. The suspension mechanism is then detached from the chocks and the latter, together with the roll, can be removed from the housings.

For the re-connection of the chocks with the suspension mechanism the crossbars 8 are put in place, and by means of turning hand-wheel 22 in the opposite direction as before the levers 11 will be disconnected from rod 21 and therefore the springs come into action with the previously adjusted tension.

What I claim is:

1. In a rolling mill, a frame, a roll mounted in said frame so as to be vertically adjustable therein, bearing chocks for said roll, rods provided in pairs for suspending said chocks from said frame, the two rods, belonging to one pair being symmetrically arranged at both sides of the vertical axial plane of said roll, levers forming pivotal connections between the free ends of said rods and said frame, and a single adjustable tensioning device for all rods, said tensioning device comprising a pair of spring members which are inserted between said levers with one spring member on each side of the vertical axial plane of said roll and a single means to adjust uniformly the pressure of each of said spring members so as to counteract the downward pull of said suspension rods.

2. In a rolling mill, a frame, a roll mounted in said frame so as to be vertically adjustable therein, bearing chocks for said roll in said frame, a pair of rods for suspending each chock from said frame, levers forming pivotal links between the free ends of said rods and said frame, and an adjustable tensioning device for said rods and said frame, comprising a pair of springs which are so arranged between said levers that they counteract the downward pull of said rods, a casing for each of said springs pivotally attached to extensions of said levers beyond their own pivots in said frame, discs, arranged at opposite ends of said springs and displaceable inside said casings for varying the pressure of said springs, and means for displacing said discs simultaneously and in opposite directions from one central point.

3. In a rolling mill, a frame, a roll mounted in said frame, bearing chocks for said roll, arranged in windows of said frame so as to be ver-

tically adjustable therein, suspension rods for said chocks, symmetrically arranged at both sides of the vertical axial plane of said roll, a tensioning device, common to all said rods, means for adjusting said tensioning device, and separate means for relieving said rods temporarily from the action of said tensioning device, said relieving means being operable independently from said adjusting means.

4. In a rolling mill, a frame, a roll mounted in said frame, bearing chocks for said roll arranged in windows of said frame so as to be vertically adjustable therein together with said roll, suspension rods for said chocks, symmetrically distributed over said chocks at both sides of the axial vertical plane of said roll, pivotal links between each rod and said frame, a tensioning device, common to all of said rods, and detachable cross-bars, each cross-bar connecting the rods at one side of the vertical axial plane to their respective chock, said cross-bars being passed through eyes arranged on the chocks and suspension rods respectively and fitting loosely in said eyes.

5. In a rolling mill, a frame, a roll mounted in said frame, said frame having two spaced-apart housings, bearing chocks for said roll, arranged in windows of said housings so as to be vertically adjustable therein together with said roll, rods for suspending each of said chocks from a housing, and adjustable tensioning means for said rods, comprising horizontal springs which are positioned in the space immediately above said roll and below the top of said housings.

6. In a rolling mill, a frame, a roll mounted in said frame so as to be vertically adjustable therein, bearing chocks for said roll, pairs of rods for suspending said chocks from said frame, means for pivotally connecting said rods with said frame, the two rods of one pair being symmetrically arranged at each side of the vertical axial plane of said roll, centrally arranged spring means common to all the suspension rods, casings for housing said spring means, said casings being pivotally attached to said connecting means, and means for adjusting the tension of said spring means.

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