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END PLATE MECHANISM FOR ROLLER MILLS

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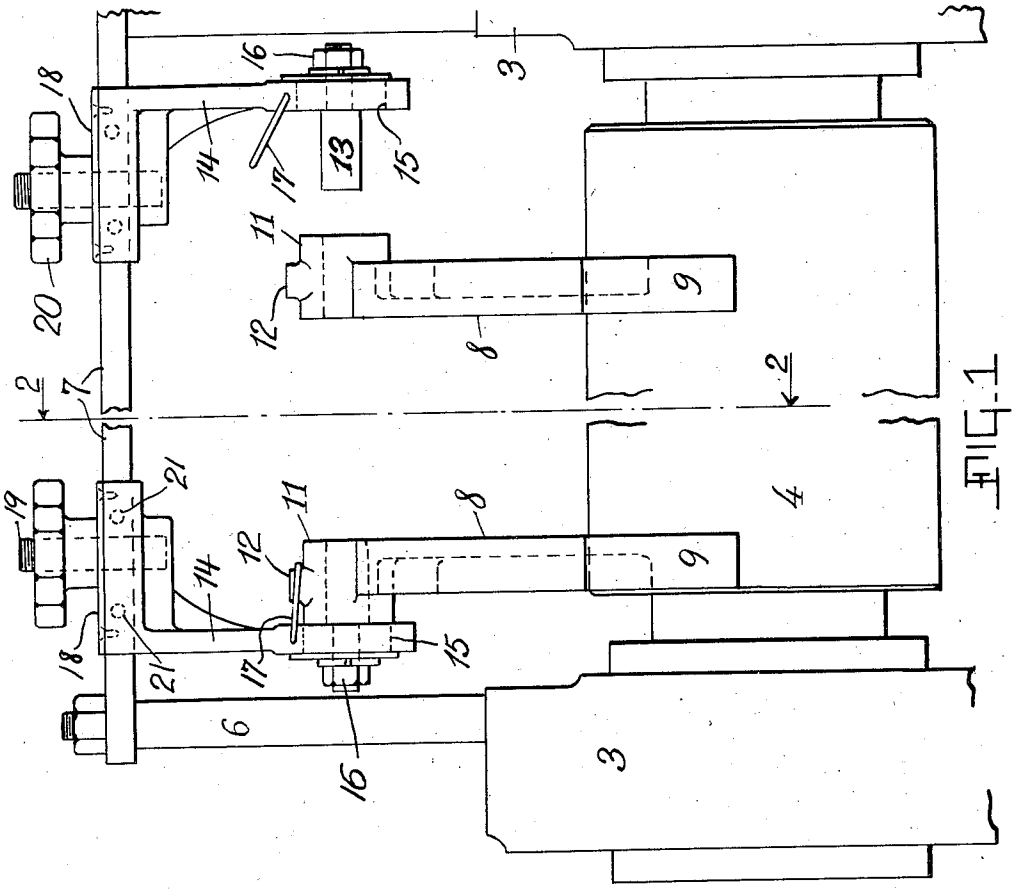


FIG. 1

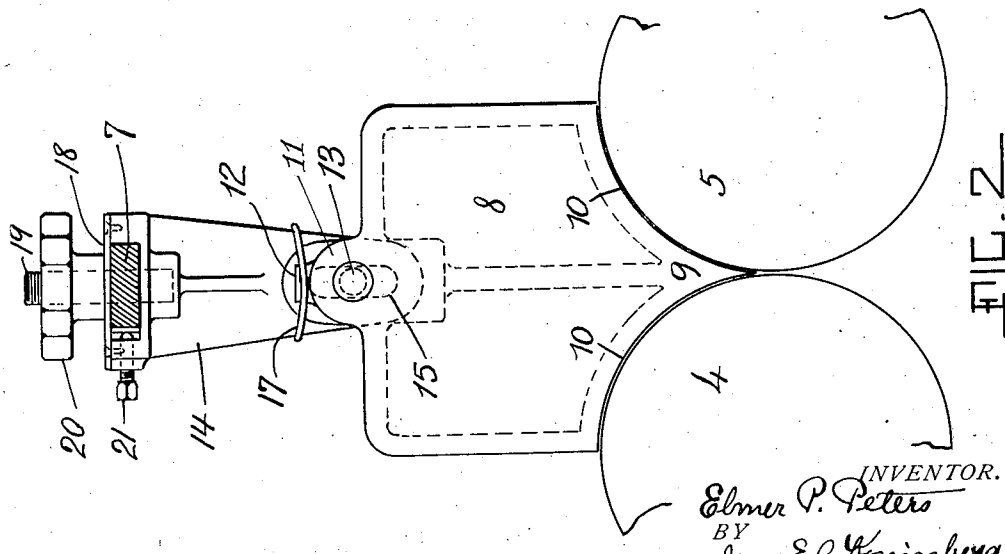


FIG. 2

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END PLATE MECHANISM FOR ROLLER MILLS

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1 Claim. (Cl. 83—22)

In the art of grinding materials on roller mills so-called end plates are used at the ends of the rollers for the purpose of confining the material which, without the end plates, would flow off or be thrown off at the ends of the rollers. Such end plates have been used for many years. When the roller mill leaves the factory the end plates are properly adjusted and their adjustment will remain as set unless disturbed from causes such as wear and tear, difference in materials, careless operation and other causes which may arise in a rolling mill factory. Inasmuch as it is of very great importance that the end plates remain permanently adjusted, it is the object of this invention to provide an improved end plate adjustment mechanism so arranged that the adjustment of the end plates remains permanent and is not disturbed even when the end plates are detached and again placed in position for instance when the plates must be washed and for other reasons.

The invention will be better understood from the following description read together with the accompanying drawing in which

Figure 1 is an elevation of a pair of end plates in position on a roller mill, parts being broken away and removed, and showing one of the end plates detached for temporary removal purposes.

Figure 2 is a view on line 2—2 of Figure 1.

Referring to the drawing the reference numerals 3, 3 denote portions of the frame of a standard roller mill, and 4 and 5 are the rollers mounted between the frames in the usual manner. The rollers are shown diagrammatically in outline and in Figure 1 the one roller 5 is removed for the sake of clearness. Above the rollers there is supported on posts 6 the usual end plate carrying bar 7 which supports two opposed end plates 8, 8 in positions adjacent the ends of the rollers. The means for supporting the end plates according to this invention are alike for the two plates, so only one will be described.

Each end plate has a body 8 forming a tongue 9 which extends down between the rollers 4 and 5 and the sides 10 of the tongue are curved to fit the circle or circumference of the rollers in the usual manner. At the top each end plate has a hub 11 and on top of the hub there is provided a round boss 12. The end plate is mounted in position by sliding its hub 11 in upon a stud 13 secured in a depending bracket 14. The stud 13 is vertically adjustable in a slot 15 in the bracket 14 and is held by a nut 16 in vertically adjusted position. In the bracket 14 there is pivoted a latch 17 in the form of a gravity operated loop. When the end plate has been placed upon the stud 13, the latch 17 falls down and engages the boss 12 to prevent lateral movement of the end plate upon the stud.

The bracket 14 is supported in the bar 7. The bracket fits up under the bar, see Figure 2, and a plate 18 is screwed on to the bracket thereby supporting the latter in sliding relation to the bar as is obvious. The bracket carries a screw bolt 19. A hand knob 20 engages the bolt and by tightening the hand knob the bracket is firmly attached to the bar. This construction of course also permits the bracket to be moved along the bar for lateral adjustment parallel to the axes of the rollers.

Lateral adjustment of the brackets and the end plates at right angles to the axes of the rollers is provided for by set screws 21 in the brackets 14 and which bear against the bar 7.

In operation the end plates are mounted upon the brackets and then the latter are adjusted along the bar 7 to bring the end plates to their proper position on the rollers, see the left side of Figure 1. Thereafter the end plates are adjusted vertically with respect to the rollers by loosening the nut 16 and adjusting the stud 13 vertically in the slot 15.

Now it must be remembered that the end plates should be as close as possible to the surface of the rollers without actually touching the rollers. A clearance of about fifteen-thousandths of an inch should be left between the plates and the rollers. This permits the material to flow freely between the plates and the rollers so that grinding takes place under the plates as well as between the rollers. If for any reason the clearance is greater than desired, the material will be thrown off and flow out sideways and particles may become wedged under the plates and cause generation of useless heat and uneven grinding.

On the other hand, if the end plates are not kept away from the rollers with the proper clearance between them, then it happens that the plates ride on the rollers, causing granulation and wear on both plates and rollers, increased power consumption and also may be the cause of warped rollers and unground material passing through the mill.

End plates are required to be adjusted from time to time and they must also be cleaned. It is obvious therefore that a construction such as herein disclosed which permits easy adjustment

laterally without disturbing the vertical end plate adjustment, and which permits ready complete removal of the end plates from the supporting brackets, is of obvious advantage. It will be noted that when the sheet **12** has been once adjusted vertically in the bracket the end plate may be detached by simply lifting the latch **17** and sliding the end plate away from the bolt, right side of Figure 1. When the plate has been cleaned or attended to, it is put back upon the stud, the latch dropped and the plate is then again supported in proper vertically adjusted position.

It will further be noted as a feature of this invention that the end plate is pivoted to swing in the stud **13**. The hub **11** of the end plate has a normal sliding fit on the stud **13** as will be understood. But at the same time, the end plate may oscillate on the hub, consequently the end plate is self-adjusting in its own plane with respect to the two grinding rollers. In other words, the material on the rollers forms a film underneath the end plate and because of the slight oscillatory movement of the end plates, the latter becomes automatically evenly adjusted between the two rollers by reason of the evenness of the film of material. Thus any slight inaccuracy in adjustment or wear is automatically compensated for.

It will further be understood that while the invention has been disclosed in its prepared form, changes may be made within the legitimate and intended scope of the appended claims without departing from the principle of the invention.

I claim:—

In a machine of the character described a pair of cooperating grinding rolls, a pair of end plates having roll-cooperating edges corresponding in contour to the peripheries of the rolls and serving with the adjacent upper surfaces of the rolls to hold material to be ground, brackets for supporting the end plates, studs in said brackets, means for adjusting the studs vertically in the brackets, said end plates having hubs fitted upon the said studs for pivoting the end plates thereupon in gravity actuated freely oscillatory relation to the adjacent upper surfaces of the rolls during the operation of the machine, said hub and stud connection between the end plates and the said brackets affording means for detaching and replacing the end plates upon the studs by a single sliding movement axially of the studs.

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