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INTERMEDIATE GUIDE FOR ADJACENT VERTICAL AND HORIZONTAL BAR-MILL STANDS

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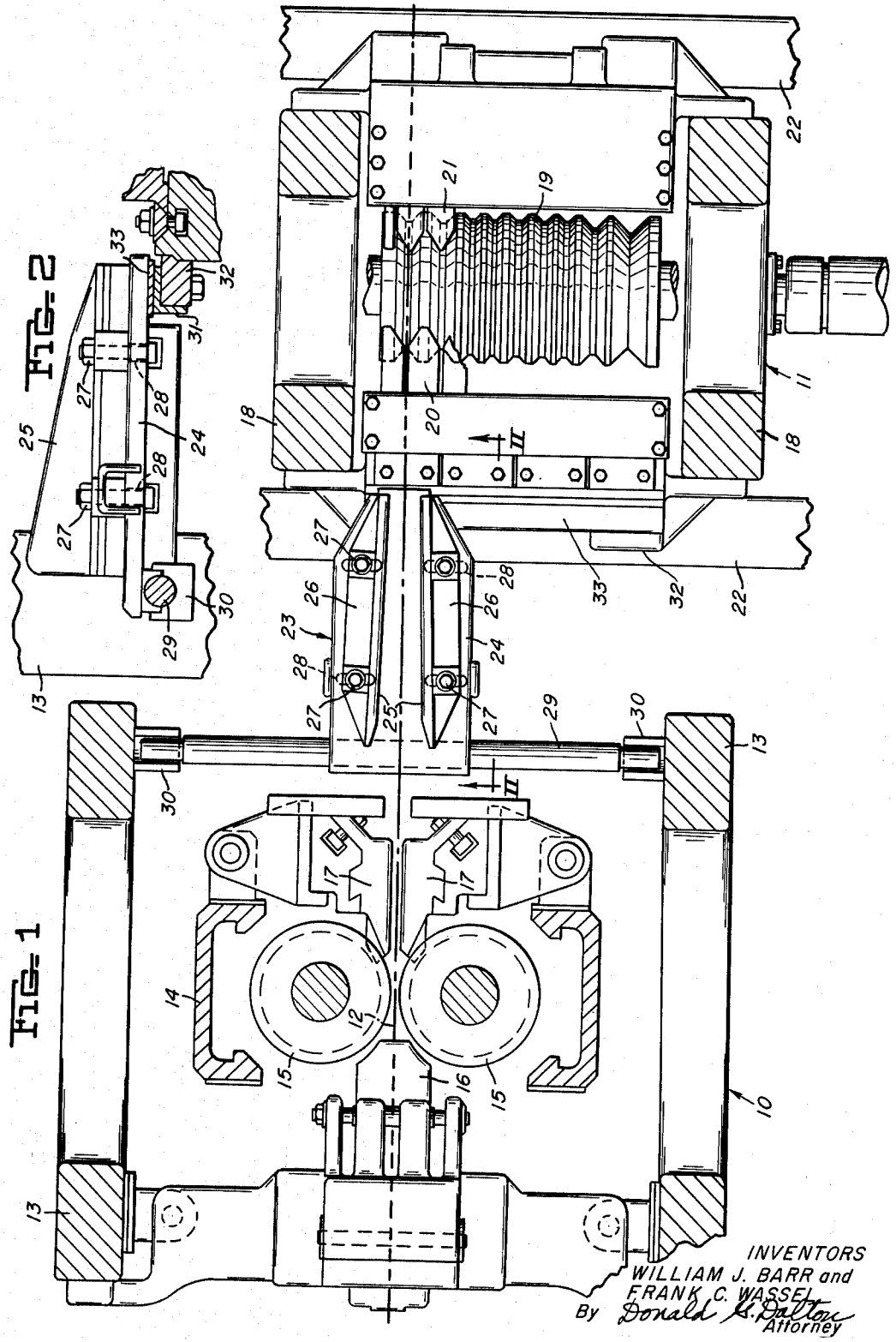


FIG. 2

FIG. 1

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INTERMEDIATE GUIDE FOR ADJACENT VERTICAL AND HORIZONTAL BAR-MILL STANDS

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1 Claim. (Cl. 80—51)

This invention relates to continuous rolling mills and, more particularly, to a guide for installation intermediate adjacent vertical-roll and horizontal-roll stands of a bar-and-billet mill.

A continuous bar-and-billet mill of the latest type usually includes in succession a vertical-roll stand and a horizontal-roll stand and this pair may be duplicated once or twice ("Making, Shaping and Treating of Steel," 7th ed., pp. 485–491). While each stand usually is provided with entrance and delivery guides, it is desirable to control the workpiece between stands by an intermediate guide or guide extension. One form of known intermediate guide was mounted on the horizontal-roll stand and had a plurality of guide passages, one for each of the several grooves or passes formed in the horizontal rolls. Difficulty was experienced with such guide, however, because of jamming or cobbling of the workpiece, to the extent that production of the mill was seriously curtailed.

We have invented an improved intermediate guide which fully overcomes the aforementioned difficulty. Our guide is a single trough extending between the vertical-roll stand and the horizontal-roll stand. It has one end fixed to a beam extending between the housings of the vertical-roll stand at the side thereof adjacent the horizontal-roll stand. A slide plate is mounted on the housings of the horizontal-roll mill at the side thereof adjacent the vertical-roll mill and the other end of said trough has sliding bearing on said plate. Thus, when the horizontal-roll mill is adjusted laterally to bring a different pair of grooves into the pass line, the guide trough remains stationary and is therefore always in properly alined position. The adjustment of the rolls of the vertical-roll stand does not affect the position of the intermediate guide in any way.

A complete understanding of the invention may be obtained from the following detailed description and explanation which refer to the accompanying drawings illustrating the present preferred embodiment. In the drawings:

FIGURE 1 is a horizontal section through adjacent vertical-roll and horizontal-roll stands, with parts omitted, showing our improved guide in plan therebetween; and

FIGURE 2 is a vertical section, taken along the plane of line II—II of FIGURE 1, showing our guide in elevation.

Referring now in detail to the drawings, a vertical-roll stand **10** and a horizontal-roll stand **11** are arranged in succession along a common pass line **12**. Stand **10** may be of the general construction of that shown in Hill et al. Patent No. 2,583,844 but the details have not been fully illustrated since they are not pertinent to the present invention. It suffices to state that stand **10** comprises vertical housings **13** having horizontal housings **14** vertically adjustable therein. Vertical rolls **15** are journaled in chocks (not shown) carried by housings **14**. Entry guides **16** for rolls **15** are mounted on housings **13** and delivery guides **17** on housings **14**. Stand **11** comprises

housings **18** and horizontal rolls **19** are journaled in chocks (not shown) carried thereby. Entry guides **20** and delivery guides **21** for rolls **19** are mounted on housings **18**.

Rolls **15** have a plurality of pairs of matching grooves which may be selectively brought into alinement with pass line **12**. Rolls **19** are similarly grooved. In the case of rolls **15**, this adjustment is effected by vertical adjustment of housings **14** in housings **13**. In the case of rolls **19**, groove selection is accomplished by laterally shifting the stand **11** as a unit transversely of line **12** along supporting rails **22**.

The stand construction and arrangement described above are conventional. It now remains to describe our novel intermediate guide and explain its cooperation with stands **10** and **11**.

Our guide is indicated generally at **23**. As there shown it is a trough comprising a bottom plate **24** on which are secured upstanding side walls **25** spaced on opposite sides of pass line **12**. The walls have base flanges **26** and bolts **27** extend therethrough and through slots **28** in plate **24**, permitting lateral adjustment of the walls. The end of plate **24** adjacent stand **10** rests on and is fixed to a beam **29** extending between housings **13**. The ends of the beam, which is in the form of a round bar, are removably seated in sockets **30** secured to the inner faces of the housings.

A slide bar **31** is mounted on lugs **32** projecting from the structure of entry guides **20**. A shim strip **33** is secured on top of bar **31** and the end of bottom plate **24** adjacent the horizontal-roll stand has sliding bearing thereon. As shown in FIGURE 1, the center line of plate **24** is vertically alined with pass line **12**. Thus side walls **25** may be positioned thereon so as to guide a workpiece delivered from stand **10** accurately into the entry guide **20** of stand **11**. As stated, the vertical adjustment of rolls **15** by raising or lowering housings **14**, has no effect on guide **23**. When stand **11** is adjusted transversely of pass line **12**, guide **23** remains unmoved by virtue of being secured at one end to beam **29** and slidably supported at the other on bar **31**. Once the guide has been properly set, therefore, it remains fixed regardless of changes in the adjustment of housings **14** and stand **11**.

Experience has shown that a single trough mounted as an intermediate guide according to our invention fully overcomes the difficulties attendant upon the use of prior intermediate guides. Our guide, furthermore, is simple in construction and, as stated, when once set, requires no further attention.

Although we have disclosed herein the preferred embodiment of our invention, we intend to cover as well any change or modification therein which may be made without departing from the spirit and scope of the invention.

We claim:

In a rolling mill, a pair of roll stands spaced apart along a common pass line, each comprising spaced housings and cooperating grooved rolls journaled therein, the rolls of one stand being vertical and the rolls of the other horizontal, and means supporting the horizontal roll stand for adjustment normal to said line, the combination therewith of a beam extending between the housings of the vertical-roll stand on the side adjacent the horizontal-roll stand, a guide trough extending between said stands having one end fixed to said beam, and a horizontal bar extending between the housings of the horizontal-roll stand on the side thereof adjacent said vertical-roll stand, the other end of said trough being slidable on said bar, and

free of attachment thereto whereby said trough remains fixed relative to said line when said horizontal-roll stand is moved transversely thereof causing like movement of said bar.

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