July 2, 1935. A. C. BRAUER 2,006,729

RENEWABLE GUIDE FOR ROLLING MILLS

Filed June 30, 1934

Fig. 1.

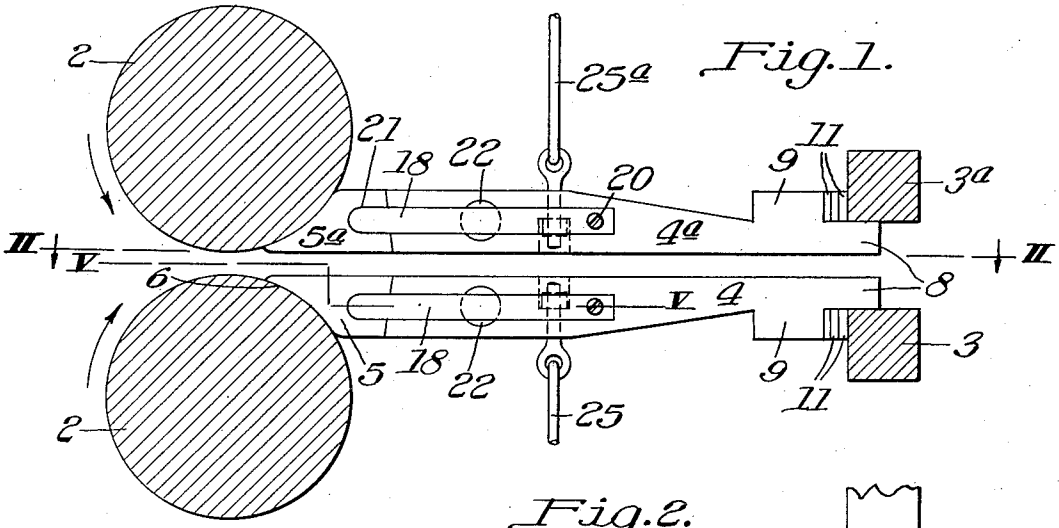


Fig. 2.

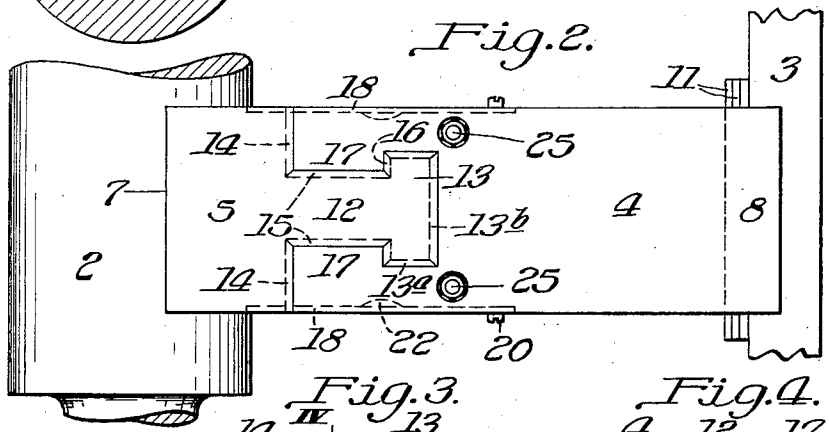


Fig. 3.

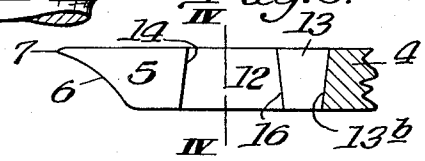


Fig. 4.

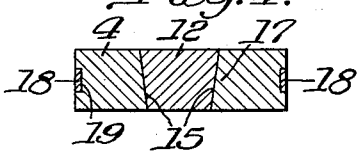


Fig. 6.

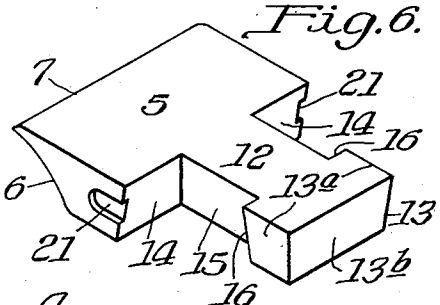


Fig. 7.

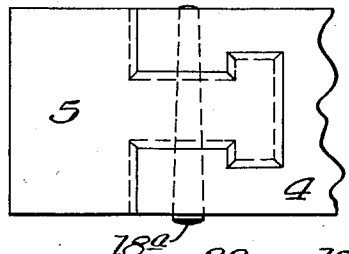
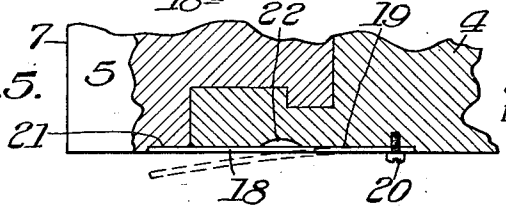


Fig. 5.



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RENEWABLE GUIDE FOR ROLLING MILLS

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Application June 30, 1934, Serial No. 733,254

14 Claims. (Cl. 80—51)

My invention consists of an improvement in renewable guides for rolling mills, adapted to receive the rolled blank, bar, strip or other form directly from the roll pass, for subsequent direction and support.

In the rolling mill art, it is desirable to provide means ensuring direct outward pass of the rolled article from the bite of the rolls and to ensure its continuous delivery therefrom in its outward travel. This is particularly important in connection with the initial emergence of the article from the rolls, when there is any tendency to adhere to or follow the contour of either roll.

Ordinarily, this is done with one or a pair of tapering terminals forming the inner end or ends of outwardly extending supporting guides usually made of steel, and frequently provided with rollers or balls on the upper surface of the lower member.

Due to the fact that the inner tapering terminals bear against the roll faces and into the nip of the rolls, and of the high temperature, these wear very rapidly, and must be frequently replaced.

In my invention I provide an inner terminal point member or members, removably connected with a supporting plate or bar, whereby the terminal member or members may be discarded when worn and replaced, the main supporting plate or bar being capable of use indefinitely.

The latter is also so constructed and mounted as to provide for longitudinal adjustment to take up wear on the terminal when desired, and is also provided with means for easily connecting and disconnecting the members, as hereinafter described.

Referring to the drawing showing one preferred construction:

Fig. 1 is a sectional view in side elevation showing my invention as applied to a pair of rolls;

Fig. 2 is a plan view on the line II—II of Fig. 1;

Fig. 3 is a detail sectional view showing the inner roll-engaging member as mounted on the supporting plate member;

Fig. 4 is a cross section on the line IV—IV of Fig. 3;

Fig. 5 is a partial horizontal sectional view on the line V—V of Fig. 1;

Fig. 6 is a perspective view of one of the point members, detached;

Fig. 7 is a plan view showing a modified construction.

Referring to the drawing, **2**, **2**, are the rolls of a mill, having the usual adjustments etc, as in standard practice. Mounted on any suitable base **3**, which may be a cross bar between the mill housings, is a supporting plate or bar **4** on the inner end portion of which is the roll-engaging guide point terminal **5**.

Said terminal is rounded on its roll-engaging side, as at **6**, and terminates in a narrow knife-like edge **7** adapted to lie in the lower or upper plane of the roll pass, i. e., tangent to the roll periphery.

As thus made, the pressure of the rolled bar in emerging from the pass of the rolls is against the opposing or supporting face of the point and its plate **4**. By reason of the connection between the plate and point, as hereinafter described, such pressure tends to tighten the joint, rather than loosen or disconnect it.

Supporting plate **4** is mounted by its outer terminal **8** on bar **3** and preferably has a supporting shoulder or abutment **9**, for longitudinal adjustment. Between shoulder **9** and bar **3** may be interposed suitable adjusting devices, as liners **11**. As the plate and its inner contact or point member **5** are adjusted inwardly, the rapid wear of the latter may be compensated for until it is worn out.

Member **5** and plate **4** are rigidly connected by means of an interlocking shank **12** and a dovetail or key head **13** engaging a corresponding receiving socket in plate **4**. Shank **12** is of reduced width, extending rearwardly of the main terminal head **5**, which abuts against the end of plate **4** by its laterally extending faces **14**.

Shank **12** is tapered downwardly at each side, as at **15**, while the faces **14** of the head **5** and inner shoulder faces **16** of head **13** taper downwardly and outwardly in opposite directions. The opposite side faces **13***a* and rear face **13***b* of head **13** taper or converge downwardly and inwardly. The receiving socket therefor of plate **4** is of a corresponding contour, as in Fig. 2, having inwardly extending interlocking abutments **17** for shouldered engagement with faces **14** and **16** of point **5** and key head **13** respectively.

The inner faces of abutments **17** and the several receiving faces of the socket are correspondingly and conformably tapered, so that when the terminal **5** is placed in position, it has a tapering fit snug and tight between the several embracing and wedging faces. By such arrangement the point member **5** makes a binding fit in the socket and is easily removed.

Such tapered conformation of the interfitting faces not only facilitate easy placement and removal of the point **5** in the socket of plate **4**, but

also effect flush continuation of the blank-engaging faces of both.

I also provide means for retaining the active terminal 5 in such interlocked wedged-in position, adapted to permit separation and removal. One such means consists of a pair of springs 18, one at each side of plate 4, preferably lying flush in shouldered grooves 19, secured by a screw or bolt 20.

Said springs extend along beyond the end of the plate and into similar shouldered grooves 21 of the terminal 5, as shown.

When thus in position, the plate and bar are fixedly held against separation, until the springs are retracted. For the purpose of easy retraction of the springs, the plate is provided with concaved clearance openings 22 for insertion of a pin or other outwardly springing pressure to disengage the spring terminals from the point 5. When the springs are thus released, the point may be removed and a new one inserted.

I show in Fig. 7 a modified construction in which the plate and point are connected by a transverse bolt 18*a*, extending through abutment portions 17 and shank 12, as will be readily understood. To insure continuous positioning of the plate and point, I connect the plate with any suitable tension element, by connections 25.

While one such supporting guide and terminal may be utilized, forming the lower face of the roll pass continuation, I show in Fig. 1 a double arrangement, forming a substantial duplicate of the construction above described. In such case a similar bar 3*a* or its equivalent may be used, and the plate 4*a* and point 5*a* are held upwardly against it and the roll by any suitable means, as supports 25*a*.

By use of the double application, below and above the pass zone of the rolls, any tendency of the rolled blank to vary from its desired outward path is positively prevented. It will also be understood that vertical lateral guides of any suitable form may be located, one at each side of the plate and its point or tip, as practiced in the use of the ordinary one piece horizontal guide or guides.

It will also be understood that the transverse downwardly and inwardly tapered socket at the front end of bar 4 for reception of shank 12 and its head 13 may extend entirely through the bar as shown, or only part way, as desired.

The especial advantage of the invention is the economy and better results arising from the ease and cheapness of the renewable terminal point 5. While the plate 4 may be made of steel or other suitable metal, it is not subject to the rapid wear and deterioration of the roll-engaging end or ends. These are preferably of cast iron, do not require machining or finishing, and have the necessary limited resistance to wear and abrasion.

The construction provides for very accurate and rigid placement of the point in its holder, with a plurality of contacting faces in varying planes, and insertion and removal towards and from the general plane of the base 4.

By adjusting the plate 4, such wear is compensated for from time to time, and when used to its limit of material, a new tip or point may be substituted at small cost and with little delay or interruption.

This application is a continuation in the main of my prior application filed April 9, 1934, Serial No. 719,702.

What I claim is:

1. A removable guide construction for rolling mills comprising a supporting plate having a transverse receiving socket at one end and a resisting abutment at the other end, means supporting the plate and means for adjusting it longitudinally, a roll-engaging point vertically inserted in the socket, and supplemental laterally movable means holding the plate and point together.

2. A removable guide construction for rolling mills comprising a supporting plate having a transverse receiving socket at one end and a resisting abutment at the other end, means supporting the plate and means for adjusting it longitudinally, a roll-engaging point vertically inserted in the socket, and supplemental laterally movable means on the plate having separable connection with the point.

3. A removable guide construction for rolling mills comprising a supporting plate having a receiving socket at one end and a resisting abutment at the other end, means supporting the plate and means for adjusting it longitudinally, a roll-engaging point inserted in the socket, and a resilient locking device secured to the plate having a portion separably engaging the point.

4. In a removable guide construction for rolling mills, the combination of a supporting plate having at one end a tapered and shouldered socket, a holding spring secured to the side of the plate, and a roll-engaging point having a tapered and shouldered shank inserted in the socket and in side engagement with the spring.

5. In a removable guide construction for rolling mills, the combination of a supporting plate having at one end a tapered and shouldered socket, a holding spring secured to the side of the plate, and a roll-engaging point having a tapered and shouldered shank inserted in the socket and a side socket engageable by the spring.

6. In a removable guide construction for rolling mills, the combination of a flat surface supporting plate having at one end a middle longitudinal transverse vertically tapered laterally shouldered socket, and a roll-engaging point having a similarly tapered and shouldered shank vertically inserted in the socket flush with the plate surface.

7. In a removable guide construction for rolling mills, the combination of a flat surface supporting plate having at one end a vertically tapered laterally shouldered longitudinal socket provided with a middle open front and a laterally enlarged rear opening, and a roll-engaging point having a rearwardly extending similarly tapered and shouldered shank with a rear enlargement vertically inserted in the socket flush with the plate surface.

8. A roll-engaging point as described having a main flat supporting surface and an opposite concaved surface terminating in a transverse edge, rear lateral inwardly extending shouldered faces, and an intervening rearwardly extending shank provided with a terminal widened shouldered end for flush insertion in the conforming socket of a supporting plate.

9. A roll-engaging point as described having a main flat supporting surface and an opposite concaved surface terminating in a transverse edge, rear lateral inwardly extending shouldered faces, and an intervening rearwardly extending shank provided with a terminal widened shouldered end for flush insertion in the conforming socket of a supporting plate, the lateral shouldered faces, the shank, and the several face portions of the end of the point being downwardly and inwardly tapered.

10. A roll-engaging point as described having a main flat supporting surface and an opposite concaved surface terminating in a transverse edge, rear laterally extending shouldered faces, and an intervening rearwardly extending shank provided with a terminal widened end, the point being recessed for engagement by a holding element for connection with a supporting member.

11. A roll-engaging point as described having a main flat supporting surface and an opposite concaved surface terminating in a transverse edge, rear laterally extending shouldered faces, and an intervening rearwardly extending shank provided with a terminal widened end, the sides of the point being recessed for engagement by a holding device.

12. A removable guide construction for rolling mills comprising a flat surface horizontal supporting plate having opposite side portions terminating in front endmost abutments at each side of a middle rearwardly extending point-receiving socket, said socket being laterally widened at the rear in front of a rear socket-terminating transverse bearing face of the plate, and a roll-engaging point vertically inserted in said socket flush with the plate surface.

13. A removable guide construction for rolling mills comprising a flat surface horizontal supporting plate having opposite side portions terminating in front endmost abutments at each side of a middle rearwardly extending point receiving socket, said socket being laterally widened at the rear in front of a rear socket terminating transverse bearing face of the plate, the faces of said abutments and sockets being tapered, and a roll-engaging point having conformable tapered faces vertically inserted in said socket flush with the plate surface.

14. A removable guide construction for rolling mills comprising a horizontal supporting plate having a middle longitudinal receiving socket at one end extending transversely through the plate from top to bottom between spaced apart sides and terminating in a rear resisting abutment means supporting the plate including a rear abutment, spacing liners between said abutment and the plate for adjusting it longitudinally, and a roll-engaging point inserted in the socket.

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