

D. M. GRIFFITHS.
 AUTOMATIC GUIDE BOX FOR IRON AND STEEL ROLLING MILLS.
 APPLICATION FILED JAN. 19, 1912.

1,078,045.

Patented Nov. 11, 1913.

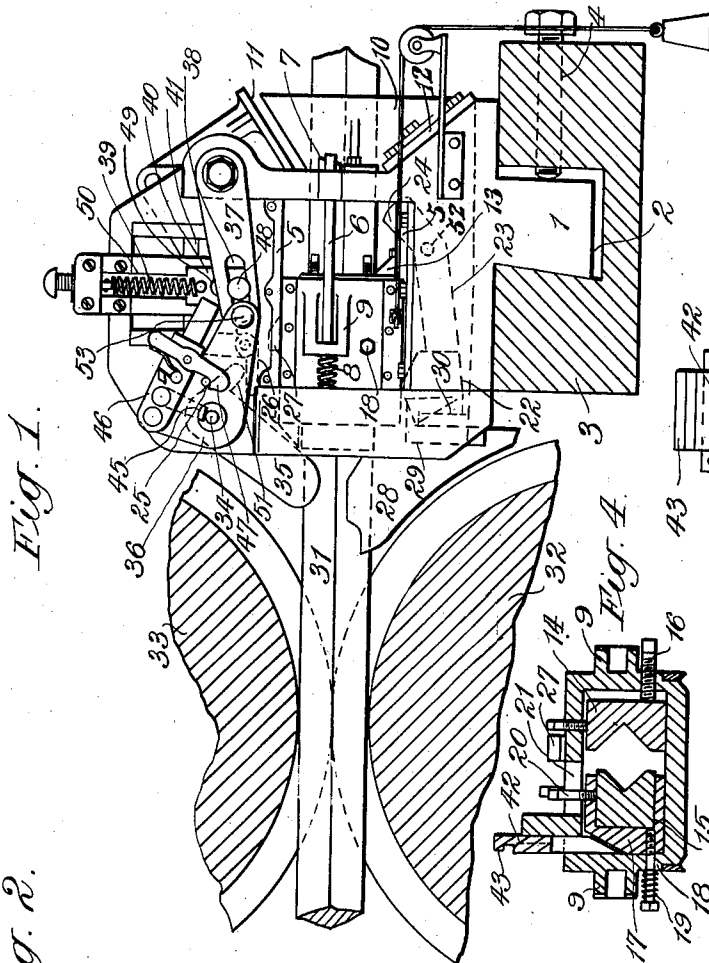


Fig. 1.

Fig. 2.

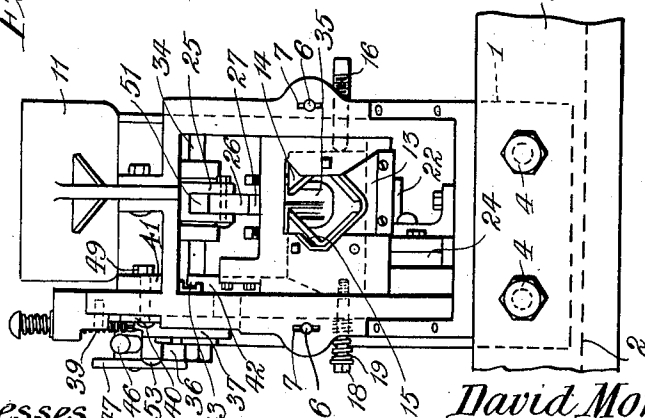


Fig. 3.

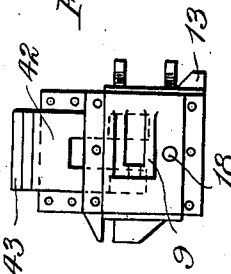


Fig. 4.

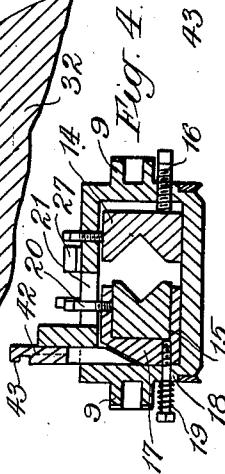


Fig. 5.

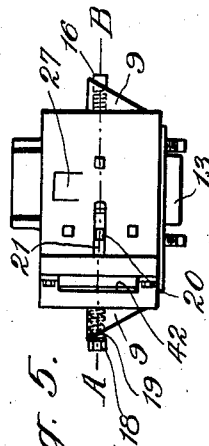


Fig. 6.



Witnesses
 Jas. E. McLaughlin
 J. B. Siggers.

Inventor
 David Morgan Griffiths
 By E. G. Siggers
 atty.

UNITED STATES PATENT OFFICE.

DAVID MORGAN GRIFFITHS, OF MERTHYR, WALES.

AUTOMATIC GUIDE-BOX FOR IRON AND STEEL ROLLING MILLS.

1,078,045.

Specification of Letters Patent.

Patented Nov. 11, 1913.

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To all whom it may concern:

Be it known that I, DAVID MORGAN GRIFFITHS, a subject of His Majesty the King of England, residing at 26 Gwaedelodygarth, Merthyr, in the county of Glamorgan, Wales, have invented a certain new and useful Improved Automatic Guide-Box for Iron and Steel Rolling Mills, of which the following is a specification.

This invention relates to an improved automatic guide box for feeding iron or steel bars to the rolls.

The invention consists in the means hereinafter described whereby the bar when inserted through my guide box serves to tighten guide blocks on itself; and, in combination with such means, in the combination of mechanical features hereinafter described.

In the accompanying drawings:—Figure 1 is a side elevation of my invention with a transverse section through the rest in front of the rolls and a transverse section through parts of the rolls in a plane coinciding with the longitudinal axis of the bar being rolled; Fig. 2 is a front elevation of the invention with the front guide baffles removed from position, and with the levers in their normal position when no bar is being fed to the rolls. Fig. 3 is a side elevation of the inner traveling box; Fig. 4 is a medial sectional elevation through A, B Fig. 5, and Fig. 5 is a plan of the top of the inner traveling box. Fig. 6 is a plan view of a catch member employed in the guide box structure.

The same reference numerals are employed to denote like parts throughout the several views.

The drawings are in parts slightly diagrammatic, they are not to be considered as determinative in detail with respect to form or dimensions; with the description hereinafter given, they will efficiently demonstrate the nature of the combination of parts which constitute my invention and the manner in which the invention is to be performed.

According to this my invention, I construct a rectangular casing, open at both ends and also at the sides. I form this outer casing with a foot-piece 1 dovetailing into the channel 2 of the rest 3 wherein it is made secure by set screws 4. The sides of the said casing are formed with or have affixed thereto longitudinal guides 5 against which the inner traveling guide box, Figs. 3, 4, and 5 bears. The gaps in the sides of the outer casings are spanned longitudinally by bars 6 traversed

by cotters 7 at the front of the casing and carrying spiral springs 8 at the ends remote therefrom to serve as buffers. The traveling box is formed with lateral ears 9 traversed by the guide bars 6. To the front of the outer casing are secured guide baffle plates 10, 11, 12 converging together toward the casing to guide the end of the bar to be introduced into the traveling box and, incidentally, to protect the mechanism from injury. The upper and lower baffles are rectangular plates, the two side baffles taper in width. The upper baffle is arranged to swing clear of the front as shown in Fig. 2, the others are affixed by means of screw bolts either passed directly through the plate or through ears formed on the plates for the purpose.

The inner traveling box is of rectangular form and may be cast in one piece or built up in sections. It is provided at its mouth with a detachable rest or guide 13 formed to suit the section of bar to be introduced, or fitted with guide pieces so formed. The guide blocks 14, 15 are likewise formed with channels to close nicely on the bar introduced, the block 14 being adjusted by a set screw 16, and held rigid by the aid of set screws bearing against its upper surface. The other movable block 15 is held in a case 17 to which it is secured by a set screw 20 which, traveling in a slot 21 in the upper part of the inner case or traveling box, serves also as a guide. A screw 18 is inserted laterally into the block case 17 which latter tends to move normally away from the block 14 by the reaction of a compressed spring 19 contained between the head of the screw 18 and the side of the case.

The traveling box is shown in Fig. 1 at the end of its stroke; in order to supply a guiding support for the end of the bar 31 before the box travels to this position, an intermediate rest 22 is provided formed, to suit the section of the bar, integrally with a lever 23 or affixed thereto. The said lever turns on a pivot 52 and its end remote from the rest 22 inclines upward as at 24 in the path of the traveling box. Referring to Fig. 1 when the box returns to its starting place, it pushes down the end 24 of the lever raising the rest 22 to the horizontal.

In a hanger or lugs 25 dependent from the roof of the outer casing is pivoted a catch 26 the near end of which is weighted so as to fall by gravity and engage a stop 27

formed on the roof of the traveling box so as to lock it at its starting place until the catch is raised as hereinafter described.

At the remote end of the outer casing I provide a detachable rest 28 formed with a snout leading into the groove in the rolls 32, 33. This rest is channeled to correspond with the section of the bar 31, and may be formed with hooked wings 29 engaging vertical lugs 30 on the outer casing. Above the rest 28 I carry into suitable bearings in the outer casing a transverse shaft 34 and I form therewith or key thereto a dependent radial lever 35 formed to suit the bar 31. The end of this lever falls into such a position as to be in the path of the bar 31 by which it is therefore lifted. The lever 35 is formed with a projecting cam 51 which actuates the catch 26 and thereby releases the traveling box. By the lifting of this lever 35 mechanism is set in motion which acts to tighten the block 15 on the bar. The said mechanism comprises two levers 36, 37, one of which is slotted as at 38, pivoted together as at 53, the driving lever 36 being keyed to the shaft 34 and the lever 37 being pivoted to the side of the outer casing. Plates 40, 41 facing machined surfaces formed on both sides of the side of the outer casing, or machined strips fastened thereto, are connected together by rivets or equivalents 49 and to the said levers by a stud 48, the side of the outer casing being slotted as at 50 to allow for the vertical travel of the rivets 49. A loose bifurcated wedge 42 engages the plate 41 by means of interlocking flanges 43, 44 formed on the respective parts. The wedge moves within vertical guides affixed to the traveling box which is slotted to allow the wedge to pass through. The engagement described permits the wedge to travel with the box without disengagement. The wedge bears against an inclined face at the back of the block case 17 and it is bifurcated so as to clear the screw 18. The lever 35 being lifted drives down the wedge by the parts heretofore described and pushes the movable block 15 inward to close on the bar 31.

To permit of the jagged end of a bar passing through the guide box without injuring the latter, it is necessary at times to suspend the automatic action of the mechanism described, it is also necessary to raise the levers after the passing of each bar. The latter result is achieved by means of a spiral spring 39 stretched by the downward motion of the parts.

The key 45 used to key the lever 36 to the shaft 34 is pivoted to a slotted lever 46 lying along the upper surface of the lever 36 and pivoted at one end to the outer casing. This lever being lifted by any suitable means frees the key 45 and throws the levers out of engagement with the shaft 34 so that the

wedge 42 is not driven down by the lifting of the lever 35. A spring catch 47 is employed to keep the mechanism normally in gear.

The traveling box is brought back to its starting position after the bar has passed by the pull of a counterweight attached to one end of a cord the other end of which is attached to the box, the cord passing over suitable guide pulleys. The device is so well known as to need no illustration.

The guide blocks remain apart until the end of the bar to be rolled has moved along between them for a suitable distance, say, about eight inches, and the bar to be rolled then engages the lever 35 which at this time is locked to the lever 36. The movement of the lever 35 causes an actuation of the latch 26 and the release of the guide blocks and at the same time the movable guide block is caused by the movements of the levers 36 and 37 to approach into engagement with the bar to be rolled.

Since the bars to be rolled are introduced for a distance through the guide blocks before being engaged thereby, no additional apparatus is required to force the bars through should they have ragged or uneven ends. The bars are driven to the pass simply by the usual rollers which feed the rolls and should there be a ragged trail end this will readily pass through the guide blocks without injury thereto, since the movable block may be readily drawn back from the bar to permit the passage of such ragged trail end. It has been customary heretofore to employ guide boxes in which the guide blocks are stationary or unyielding, and such guide blocks are often broken or otherwise injured by the ragged end of the bar to be rolled.

The guide blocks close on to the bar about eight inches more or less from its end to clear any unevenness which may occur at such point, but the guide blocks do not grip the bar too tightly to prevent it from passing farther through the blocks, and by the time the lever engaged by the bar to be rolled has been fully actuated by the bar and has closed the blocks upon the bar the end of the latter is about four inches from the pass of the rolls, and this is taken care of by the travel of the guide box. On the travel of the bar to be rolled through the guide blocks should it be obstructed because the bar was not directed in a straight line through the box or because of the presence of a scale or fin which may happen to be on the bar immediately before the blocks, the latter and the box will approach the rolls until the bar has been gripped thereby. The stationary guide block is so adjusted that when the movable block is close against the bar to be rolled the exact space is left for the bar to pass between the pair of blocks. The parts

are so proportioned that when the bar to be rolled has pushed the lever 35 clear of its end the inclined face of the wedge 42 has passed the inclined face of the movable block, so that even should the wedge be forced farther down it will have no further action on the block and the bar will therefore not be gripped too tightly to feed to the rolls.

- 10 The present invention permits large sections of round bars to be rolled by the same method as small ones and this without employing any kind of apparatus to force the bar through the guide blocks to the rolls.
- 15 With stationary guide boxes the difficulties of rolling round bars are so great that it has been found more profitable to work large sections by hand, although a slow and laborious process. There is also a limit to the length of the bars which may be so rolled, such limit being about thirty feet, and, moreover, the speed of the rolls had of necessity to be lowered to suit the workmen. By the present invention a bar ninety feet long can be worked in shorter time and at less cost of labor because it may be rolled at top speed and requires no men to guide it through the rolls, and, moreover, it has only to be passed once through the finishing groove instead of three or more times, as is necessary in hand rolling.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

- 35 1. In a rolling mill, a traveling guide box for feeding bars to the rolls, adjustable guide blocks carried thereby and means actuated by the passage of the bar through the guide for tightening the said blocks on the said bar.

- 40 2. In a rolling mill, a traveling guide box for feeding bars to the rolls, adjustable guide blocks carried thereby and a lever actuated by the passage of the bar through the guide for tightening the said blocks on the said bar.

3. In a rolling mill, a traveling guide box for feeding bars to the rolls, adjustable guide blocks carried thereby, a vertical wedge for laterally tightening said blocks on the bar, a lever geared to the said wedge and means for automatically operating said lever upon the passage of the bar through the guide.

4. In a rolling mill, means for feeding bars to the rolls comprising an outer casing, a traveling guide box mounted therein, adjustable guide blocks carried by the box, a wedge in operative relation to one of the blocks, a lever carried by the casing in the path of a bar to be rolled, a shaft mounted in said casing, means for connecting the lever to the shaft, connections between the shaft and the wedge, means for disconnecting the shaft from the wedge, and an automatic catch for locking the guide box at one limit of its travel.

5. In a rolling mill, a guide box for the bar to be rolled mounted for movement with the bar in the direction of and during the travel of the bar to the rolls.

6. In a rolling mill, a guide box for the bar to be rolled mounted for movement with the bar in the direction of and during the travel of the bar to the rolls, the box having guide blocks therewithin relatively adjustable in a direction lateral to the direction of travel of the bar to be rolled through the box.

7. In a rolling mill, a traveling guide box having guide blocks, and adjusting means for causing a relative positioning of the blocks laterally of the movement of a bar to be rolled through the guide box and located in the path of the bar for actuation thereby.

In testimony whereof I have hereunto set my hand this 9th day of January, 1912, in the presence of two subscribing witnesses.

DAVID MORGAN GRIFFITHS.

Witnesses:

WILLIAM DAVIES,

WILLIAM H. ROBERTS.