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Patented June 18, 1901.

J. F. CRAVEN.

BILLET TURNING DEVICE FOR ROLLING MILL FEED TABLES.

(Application filed Apr. 9, 1901.)

(No Model.)

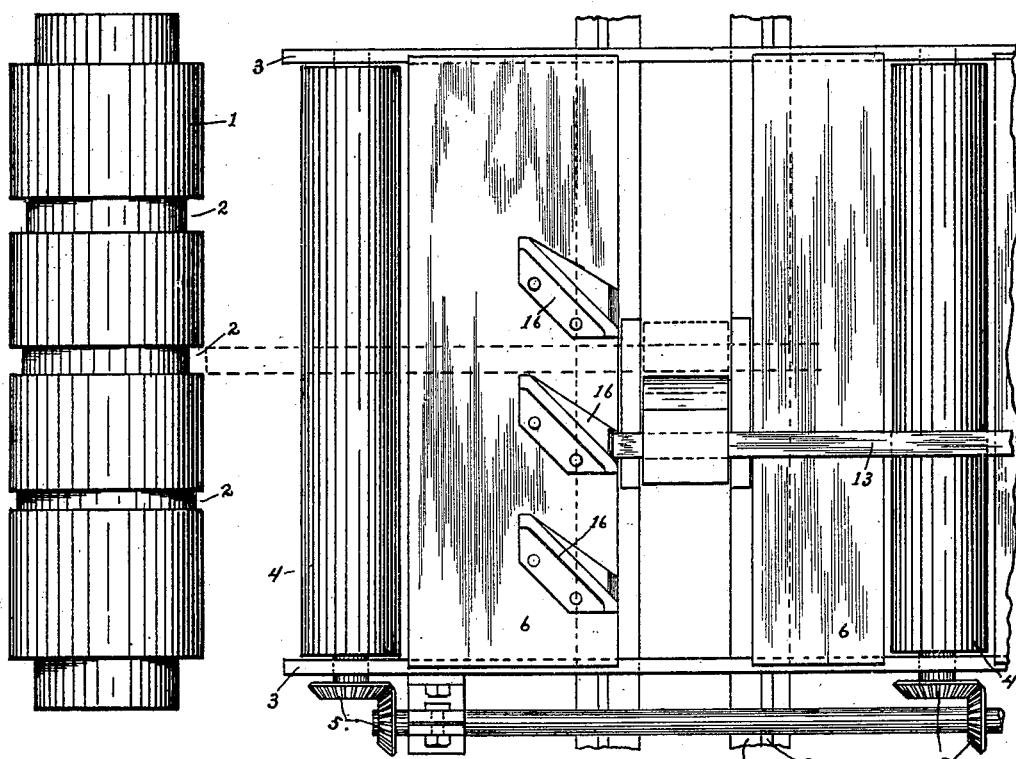


Fig. 1

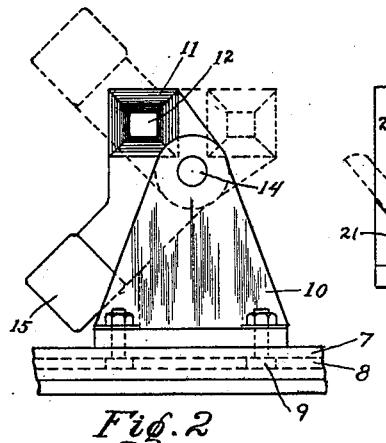


Fig. 2

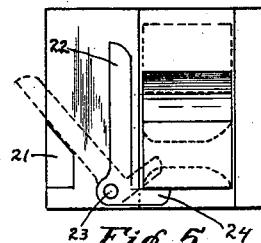


Fig. 5

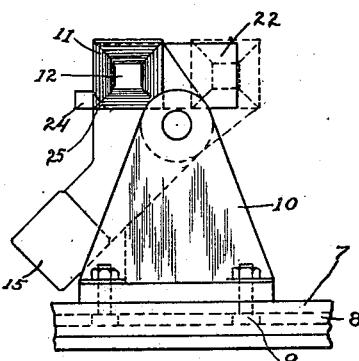
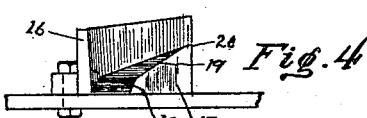
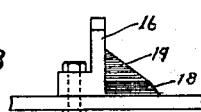


Fig. 6

Fig. 3



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# UNITED STATES PATENT OFFICE.

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## BILLET-TURNING DEVICE FOR ROLLING-MILL FEED-TABLES.

SPECIFICATION forming part of Letters Patent No. 676,423, dated June 18, 1901.

Application filed April 9, 1901. Serial No. 54,968. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES FRANKLIN CRAVEN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have 5 invented a new and useful Improvement in Billet-Turning Devices for Rolling-Mill Feed-Tables; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to devices for turning 10 billets, rods, and similar articles in rolling-mills, and has for its object a device for this purpose which operates automatically and without the expenditure of any power.

During the rolling of metal billets and rods 15 they must frequently be given a quarter-turn in order to prevent the formation of fins or to roll down those already formed. When the billet or rod comes from the last pass of the billet-mill, there are usually small fins on 20 its two side faces, which fins are rolled down in the pass of finishing-rolls. In order to accomplish this, the billet or rod must be given a quarter-turn. Prior to my invention the billets or rods have either been turned by 25 hand or by devices which were operated by a power-cylinder or similar power mechanism.

The object of my invention is to provide a device for turning such billets or rods which does not require any attendant to operate the 30 same and which is operated automatically by the momentum of the traveling billet itself.

To this end it comprises a rocking guide adapted to receive the end of the billet or rod and which is mounted in the feed-table 35 or adjacent to the finishing-rolls, together with an abutment behind said guide, against which the forward end of the billet or rod strikes and by which it is deflected to thereby cause a rocking of the guide in order to turn the 40 billet or rod.

In the accompanying drawings, Figure 1 is a plan view of my device and a portion of a feed-table. Fig. 2 is a front end view of the rocking guide. Figs. 3 and 4 are different 45 end views of the abutment, and Figs. 5 and 6 are a plan and end view of a modified construction.

1 represents the finishing-rolls, having the passes 2. In front of said rolls is a feed-table 50 having the side pieces or cheeks 3, in which are mounted the rollers 4, which are preferably power-driven, as by the bevel-gears 5.

Extending across this feed-table between the cheeks 3 is the apron-plate 6, which is cut away to permit the rollers 4 to project above 55 the same. Below the feed-table is a suitable foundation, to which is secured the bed-plate 7, provided with undercut slots 8, extending transversely of the feed-table. In these slots are T-bolts 9 for securing in any desired position transversely of the table the pedestal or base 10, in the upper end of which is pivoted the billet-turning guide 11. This guide is provided with an opening 12, which, as shown, is square and somewhat funnel-shaped 60 65 in order to easily receive the billet 13. This guide is pivoted to the base or pedestal 10 on a horizontal pivot 14, lying longitudinal of the feed-table and parallel to the line of travel of the billet 13. The said guide is provided with 70 the counterweighted arm or projection 15 for returning it to its normal position after having been rocked. To the rear of this guide, secured to the apron-plate 6, are the abutments 16, which, as shown in Fig. 1, correspond in number to the passes 2 in the finishing-rolls and are stationary or fixed in place. Each abutment comprises a plate which stands in a substantially vertical position, being inclined or running at an angle to the line 75 80 of travel of the billet 13, its forward end being in such a position that the end of the billet as it passes through the guide-opening 12 will strike fairly against the inclined face of said abutment and the rear end of said abutment lying a little beyond a line projected through the axis of the pivot 14 of the guide. The face of the abutment 16 is provided with the ledge 17, which rises abruptly for a short distance, as at 18, and then rises gradually, 90 as at 19, until it disappears, as at 20. The upper edge of the abutment 16 rises gradually, as shown, to prevent the billet passing over it as it is raised by the ledge 19.

The operation of this device is as follows: 95 The rod or billet 13 as it leaves the finishing-pass of the billet-mill has a comparatively high velocity, which causes it to travel along the feed-table, and in case the rollers of the table are power-driven its velocity is aided. 100 In either event the traveling billet or rod has its forward end directed into the opening 12 of the guide 11, and as it passes therethrough and strikes the abutment 16 with consider-

able force its forward end is raised sharply by the face 18 of the ledge, which has the effect of raising the guide 11 to start it to rotate or rock about its pivot. The continued movement of the billet or rod carries its end up the ledge-face 19, thereby further raising the guide 11, and the inclined portion of the face of the abutment deflects or crowds the billet toward one side, and as the guide-opening 12 lies considerably above the pivot 14 this deflection sidewise of the billet, together with its upward movement, carries said guide 11 over sidewise until it falls into the position shown in dotted lines, Fig. 2. The rear or inner end of the abutment is in such position that when the guide 11 is given a full quarter-turn the rod or billet will freely pass the end of said abutment; but said end will prevent the return of the guide to its normal position until the billet has cleared the same, and as soon as this occurs the counterweight 15 will return the guide to its normal position. The guide will be secured in such position on the bed-plate 7 that when rocked into the dotted-line position shown in Fig. 2 it will be in line with the desired pass 2 of the finishing-rolls 1, so that the device serves not only as a means for turning the billet or rod, but also for guiding it to the pass of the finishing-rolls. The abutments 16 are not removable; but one thereof is provided for each pass 2 of the finishing-rolls, while but one guide 11 is provided for all of the passes.

In case the billet or rod is of such length that its forward end has reached the turning device before the rear end has cleared the billet-rolls, which is liable to be the case with small rods, then said rod in being turned must be twisted, and as this may require considerable force I have devised a modification whereby a positive rotation or rocking of the guide 11 is secured, this modification being shown in Figs. 5 and 6. The guide 11 and its counterweight are unmodified; but the abutment comprises a fixed stop 21 and a pivoted plate 22, against which plate the end of the rod is adapted to strike. This plate is pivoted on a vertical pivot 23 and is provided with the toe 24, which lies normally at one side of the guide 11, as shown, and the plate 22 normally lies in front of the opening 12 in the guide 11. The end of the rod as it passes through said guide will turn the plate 22 on its pivot, whereby the toe 24 will engage the side of the guide and positively rock it over into the dotted-line position, either the said toe 24 or the side of the guide 11 being beveled, as at 25, to facilitate this movement. The plate 22 will rock backward until it strikes the stop 20, and in this position it will serve as an abutment which will deflect the end of the rod sidewise in the same manner as above explained in connection with the abutment 16. In the use of either of these modifications as soon as the billet or rod has passed through the guide the latter will be re-

turned to its normal position by means of the counterweight 15, and will thus be in position to receive the next billet or rod. By the use of this device it is possible to turn or rotate the billet or rod without the intervention of any workman, either to turn the same or to return the guide to its normal position, and also without the expenditure of any power, the turning being performed by the momentum of the traveling billet or rod.

While I have shown my invention adapted to turn a billet or rod just prior to entering the pass of the finishing-rolls, I desire it understood that the invention is not limited thereto, but that it may be used to turn a billet, rod, or plate at any stage in the rolling of the same. Neither do I desire to be limited to the means shown for pivoting the rocking guide, but intend to include all means for so mounting the guide that it will rock to turn the billet or rod as desired.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet or rod and turn the same, and means adjacent said guide against which the end of the traveling billet is adapted to abut, whereby the guide is rocked.

2. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet and turn it, means adjacent said guide against which the end of the traveling billet is adapted to abut, and means for returning said guide to its normal position.

3. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet and turn it, means adjacent said guide against which the end of the traveling billet is adapted to abut, and a counterweight for returning said guide to its normal position.

4. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet and turn it, and an inclined abutment adjacent to said guide against which the end of the traveling billet is adapted to abut, whereby the guide is rocked.

5. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet and turn it, and a fixed abutment to the rear of said guide and inclined thereto, against which the end of the traveling billet is adapted to abut and by which it is deflected, whereby the guide is rocked.

6. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet and turn it, and an abutment adjacent thereto having an upwardly-inclined face against which the end of the traveling billet is adapted to abut and by which it is raised to rock the guide.

7. A billet - turning device, comprising a rocking guide adapted to receive the end of the billet and turn it, a counterweight to return the same to its normal position, and an

abutment having a face against which the end of the traveling billet strikes and by which it is deflected to rock the guide.

8. A billet-turning device, comprising a 5 rocking guide adapted to receive the end of the billet and turn it, and an abutment adjacent thereto against which the traveling billet is adapted to abut, said abutment having an inclined face and upwardly-inclined ledge 10 whereby the end of the billet is gradually

raised and deflected sidewise to rock the guide.

In testimony whereof I, the said JAMES FRANKLIN CRAVEN, have hereunto set my hand.

JAMES FRANKLIN CRAVEN.

Witnesses:

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