Aug. 24, 1926. 1,597,557

J. B. TYTUS ET AL

FEED TABLE

Filed May 1, 1923 2 Sheets-Sheet 1

Fig. 1.

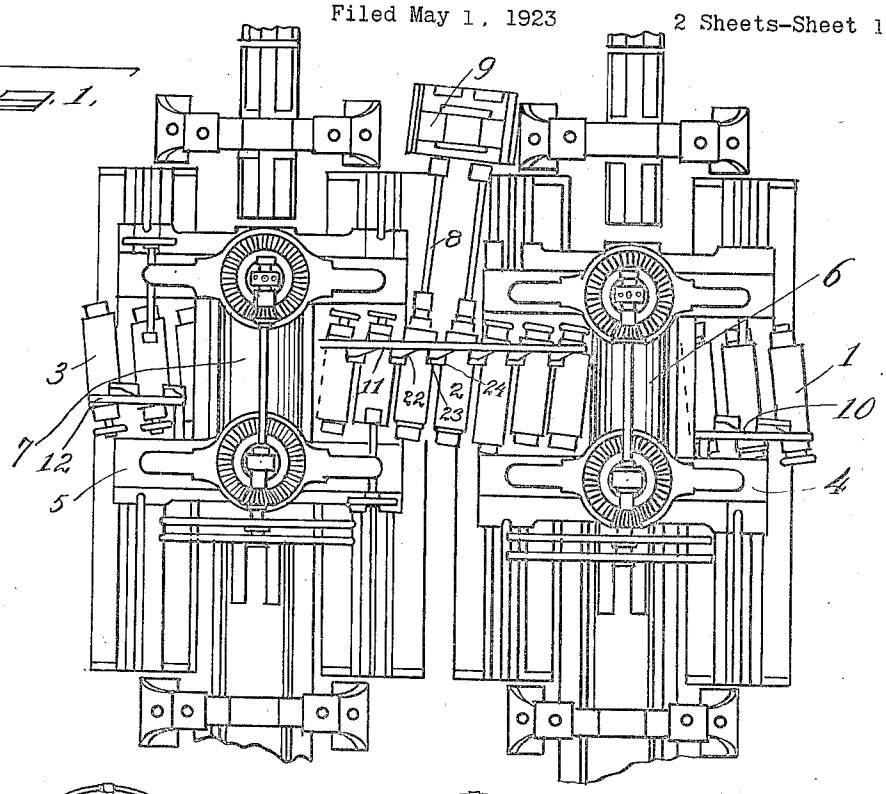
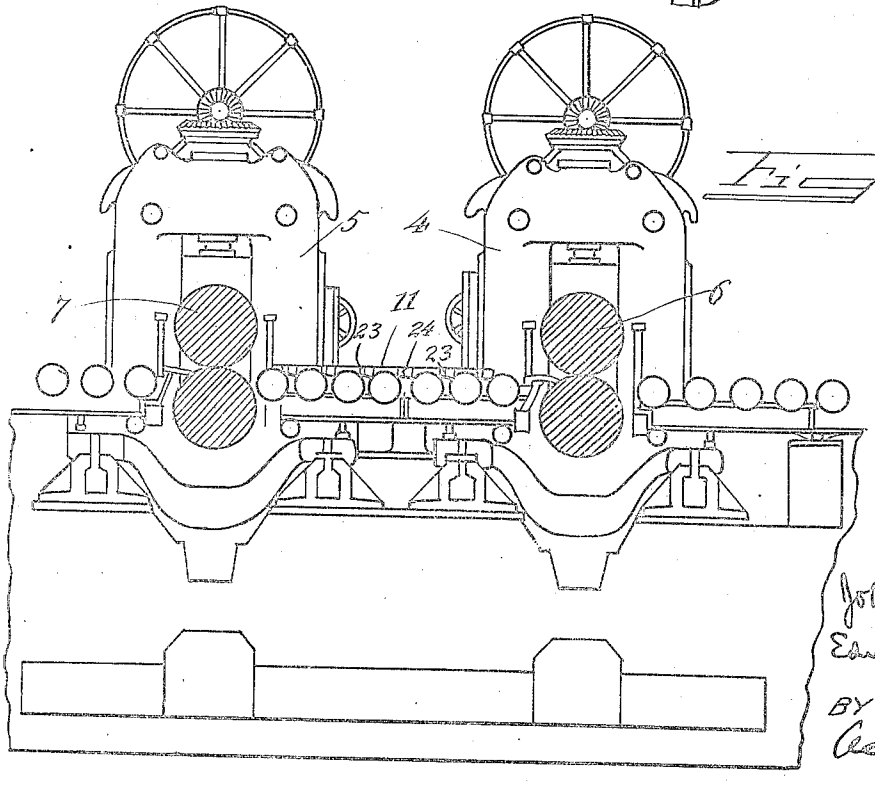


Fig. 2.



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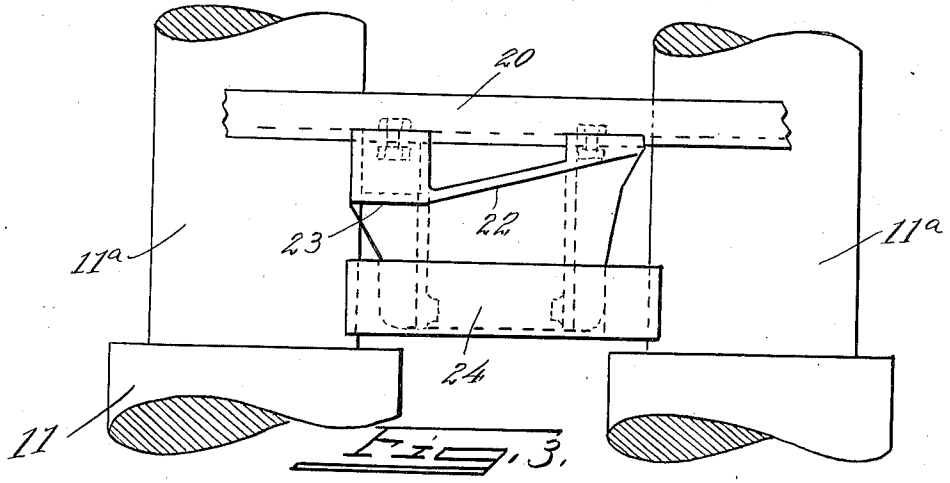


Fig. 3.

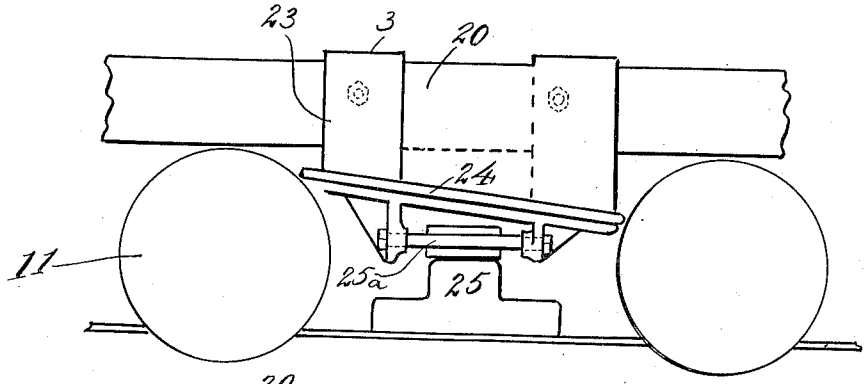


Fig. 4.

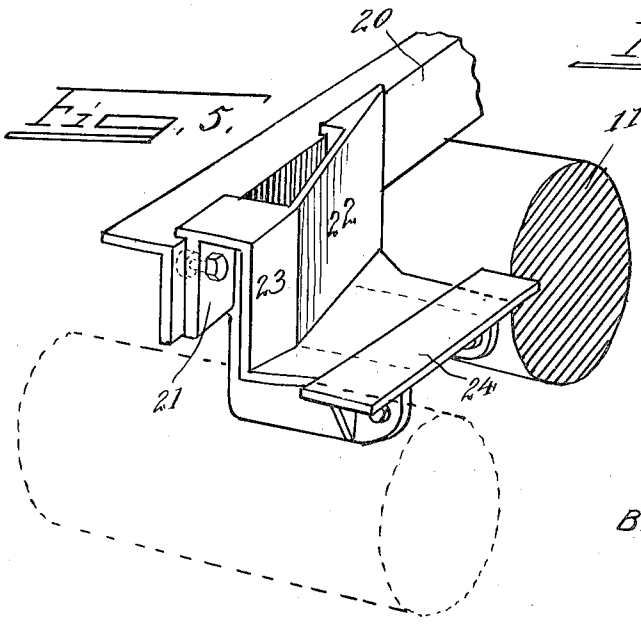


Fig. 5.

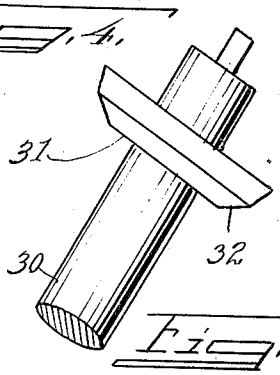


Fig. 6.

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UNITED STATES PATENT OFFICE.

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FEED TABLE.

Application filed May 1, 1923. Serial No. 635,976.

Our invention relates to tables for feeding a piece of metal being worked upon in rolling mills, in such a way that the piece will be correctly guided.

In the use of automatic means so far as possible to secure continuous treatment of metal pieces in the rolling mill, it has been found desirable to devise a feed table, which will carry a piece of metal being worked to the bite of rolls. This is particularly so where tandem action is to be used, wherein the piece passes without stopping from one stand of rolls to another. In the continuous mill, so called, the piece is engaged by two or more stands of rolls, at the same time. In the tandem mill the piece is released by one stand of rolls before being engaged by the next stand. Our invention is particularly valuable in tandem mills.

In rolling mills, and particularly tandem mills, of the past, there has aways been difficulty in getting an accurate placing of the piece with regard to the several stands of rolls, with the result that the rolling action, due to improper fit of the rolls, to the piece, has not been perfect.

Feed tables for plate and wide strip metal in which the effort is made to enforce a given path to the piece between stands, by using side guides, have not been highly practical because the force imparted to a piece by driven rollers on which it rests is not sufficient to force it to pass between two guides one on each side where any jamming takes place.

Another point in feed tables, is that the piece has a tendency to curl at the ends due to the roller action, and this curled portion will often force its way down between rolls in the live roller feed table.

It is the object of our invention to provide a table in which the piece is forced by the feeding action to ride along a single side guide structure, with the result of enforcing a given line to the piece, and in avoiding the binding of the piece between two guides one on each side.

It is also our object to so design the guide that the piece does not work down between the rolls and furthermore so design it that the piece cannot jam in between the guide and the carrying rolls.

More specifically we provide a table in which the rollers are set askew to the desired line of feed, and in which the stands of rolls may be staggered so as to be out of true center line with each other. The side guide structure then acts to enforce a straight line movement to the piece and the skewed rollers to keep the piece up against the side guide. The staggering of the stands of rolls is to permit some side motion to the piece after it leaves one stand thereby avoiding chance of jamming against the side guard, since the piece can move bodily sidewise, and become truly aligned with the guide, before reaching the next stand of rolls.

We accomplish our objects by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings:

Figure 1 is a top plan view of the device, shown with two stands of rolls.

Figure 2 is a side elevation of the part shown in Figure 1, both Figures 1 and 2, having the side guide devices merely indicated.

Figure 3 is a plan view on a larger scale of a member of the side guide.

Figure 4 is a side elevation of the same.

Figure 5 is a perspective view of the parts shown in Figure 3.

Figure 6 is a plan view of a modified side guide.

Referring first to Figures 1 and 2, it will be noted that three tables or parts of tables are shown. There is the table formed of live rollers 1, the table formed of live rollers 2, and the table formed of the live rollers 3. There are also shown two rolling mills, having housings 4 and 5 and pairs of rolls, 6 and 7 respectively. We have indicated a drive for the central table formed from the rollers 2, in the form of shafts 8, driven from a motor 9, the rollers being geared to the drive so as to rotate in the same direction. The piece moves from right to left over the structure as it is shown in the drawings.

The rollers 1 are set askew to the line of feed in one direction, the rollers 2 askew in the opposite direction, and the rollers 3 in the same direction again as the rollers 1.

A line drawn through the center of the mill rolls 6, and at right angles to the rolls will not co-incide with a like line through the rolls 7, so that the piece will have to move in the direction of skew of the rollers

2, in order to be centered between the rolls 7.

As stated we have merely indicated the side guide structure in Figures 1 and 2, in which the side guides generally noted at 10, are set over the rollers 1, the guides 11 over the rollers 2, and the guides 12 over the rollers 3. It will be noted that the tendency of the skewed rolls is to force the piece to travel in a direction at right angles to the axes of the rolls. This tendency is opposed by the side guides, with the result of the piece taking a straight line in a continuously maintained contact with a guide along one edge thereof only. As the piece enters the first stand of rolls it is guided to center between them, and when it emerges from this stand, the rollers force it bodily sidewise against the guide 11, thereby centering it with the rolls 7. Thus it is not necessary to taper the guides at the receiving end, or to locate the guides close to the line of delivery to the table, either of which structures may result in damaging the piece or breaking the guide.

Although not illustrated it will be noted that the next stand of rolls will be in the position of the stand 6.

The staggering is not necessary, of course, as the rolls might each be offset to the same side of the previous stand as the offset of the latter. This, however, would result in the straggling of the complete tandem mill across the floor of the plant, requiring more space than the arrangement indicated.

Referring next to the particular side guides shown, which are set forth as specific forms which we recommend for use with our skew table device when handling thin pieces, and not as the sole form of side guide which will be valuable and practical therewith, it will be noted that some form of mounting bar, such as the angle bar 20 is provided, this bar extending along the roller table, at some adjusted position to give proper alignment to the piece.

The guide pieces proper or "flights" are formed of special shape, adapted to lie between each roll of the set on any one table, and present slanting surfaces at points where the pieces carried on the table would tend to jam.

Thus the attaching lugs 21 are secured to the depending flange of the mounting bar, with the depending portion of the guide pieces presenting a surface 22 which slants from the line of the mounting bar, and terminates in the portion 23, that is the ultimate side guiding portion. The guide member then extends horizontally in a general way at the lower end, close to the surfaces of the rollers, and the working face at this point is a slanting plate 24, which dips in the direction from which the piece of metal being fed, approaches it.

There may be mounted beneath the rolls some form of base support 25, that extends across between the rolls, and a roller or foot 25[a] on the flight will rest on this support 25.

The portions 22, 23, and 24 are indicated in Figures 1 and 2.

In Figure 3 is indicated the structure where the rolls of the table have to be very close together, as in handling thin sheets of metal that bend easily. In such an instance the ends of the rolls where the several guide portions, or "flights" are to be mounted are cut away as at 11[a], so that the peripheries of the rolls do not interfere with the use of a full length flight.

In operation the piece being carried by a table having the rollers set askew as noted, is driven up against the side guide devices. The advancing corner of the piece will strike the slanting face 22 of the first flight, and will feed along to the portion 23. The entire piece will thus be brought by the action of the rollers and of the face 23 of the first flight into parallelism with said face 23.

The corner of the sheet cannot work in between the roller and the guide or jam under the mounting bar, as the flight tapers on to a position beyond the possible path of the piece as it first strikes it, thereby preventing a jamming.

The flights will be close enough together so that the piece engages two or more at the same time, and the faces 23 being in a single plane, will operate as a single straight edge in guiding the piece.

The piece cannot work under the guide flights or buckle down between the rolls, because any bent corner or edge of the piece exhibiting this tendency will engage first the shovel like bottom face 24 of the flights, and be gradually diverted to its proper position. The web connecting the face 24 with the vertical faces 22 and 23. closes up any space into which the piece might work intermediate the base and side portions of the flights.

As a modified form of side guide, the rollers as indicated at 30 may be fitted with collars 31, in such a way as to line up their faces 32 to the desired line of feed. The collars may be secured in any desired adjustable manner and will control the line of feed in substantially a like manner to the flights.

Our table constructed in accordance with the principles inherent in the detail description above, will serve to both feed and guide pieces of metal having sufficient length of edge to engage a side stop. We have described the invention in connection with several stands of rolls to indicate one valuable point of usefulness for such a table, and also because we believe that a tandem mill or continuous mill for slab, plate and

sheet rolling, in combination with a guiding table of this character, possesses independent features of invention, particularly where an offset position of the several mills is provided for. The side guide element, broadly conceived, might be fixed, or movable with the rolls and formed thereon.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. A flight forming part of a roller table guide comprising a vertically extending face tapered off toward the receiving end of the table, and a horizontally extending face located between the rollers and tapering downwardly toward the receiving end of the table, whereby the tendency of the piece being fed to be caught under the guide flight is avoided.

2. A flight forming part of a roller table guide comprising a vertically extending face tapered off toward the receiving end of the table, and a horizontally extending face located between the rollers and tapering downwardly toward the receiving end of the table, whereby the tendency of the piece being fed to be caught under the guide flight is avoided, and said roller table formed with rollers which are reduced in diameter adjacent the flights, whereby the roll peripheries do not unduly limit the extent of the said flight.

3. In combination, a stand of rolls to operate on a piece of metal, a second stand of rolls to operate successively thereto on said piece, and a table intermediate said stands formed with live rollers set askew to the line of feed between said two stands, said table having a side guiding means located on a line to direct the piece to the center of the second stand of rolls, said guide being on the sides of the rollers to which they tend to force the piece.

4. In combination, a stand of rolls to operate on a piece of metal, a second stand of rolls to operate successively thereto on said piece, and a table intermediate said stands formed with live rollers set askew to the line of feed between said two stands, said table having a side guiding means located on a line to direct the piece to the center of the second stand of rolls, said guide being on the sides of the rollers to which they tend to force the piece, and the center line of the first stand of rolls offset away from the center line of the second stand in a direction opposite to said tendency of feed of the rollers.

5. A feed table comprising a series of rollers set askew to the desired line of feed, and guiding means arranged in the line of feed, and positioned along the table so as to engage the piece being fed in opposition to the out-of-line feeding action of the rollers, and means for delivering the piece to be fed to the table with its edge to be guided away from contact with the guiding means and a stand of rolls located at the delivery end of said table and having its center arranged with relation to the said guiding means.

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