

July 27, 1926.

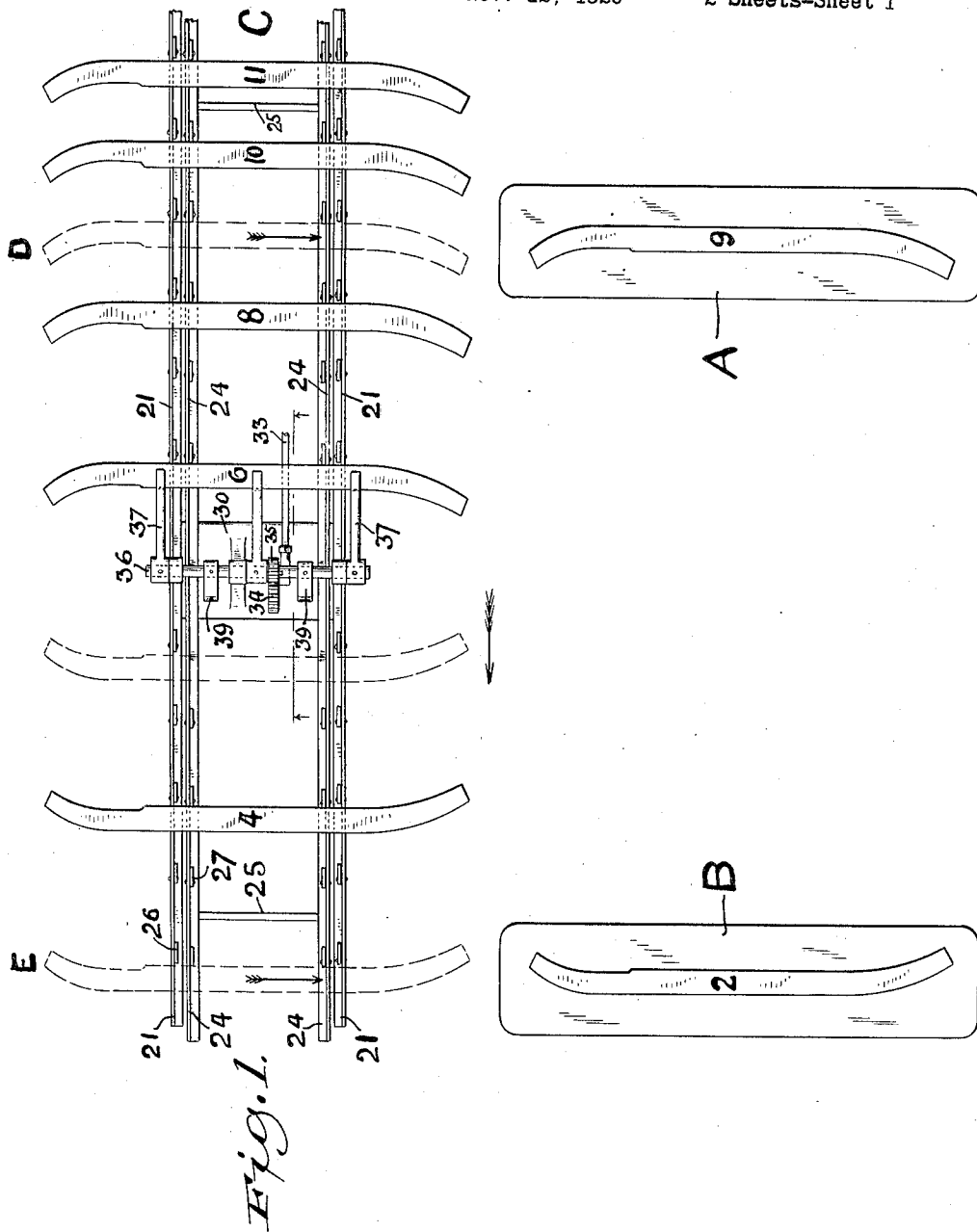
W. E. RICHTER

1,594,326

BLANK REVERSING DEVICE FOR DRAWING PRESSES

Filed Nov. 12, 1923

2 Sheets-Sheet 1



WITNESS:

Frederic Palm
DEL.

INVENTOR.

Walter E. Richter,
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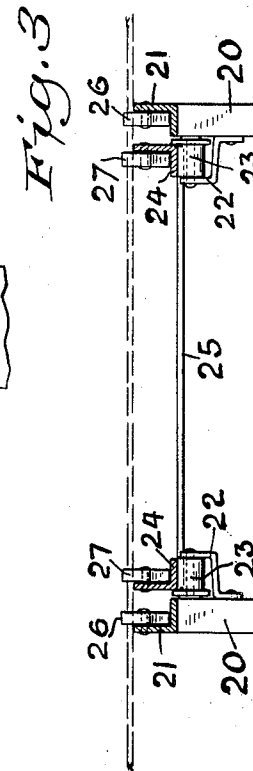
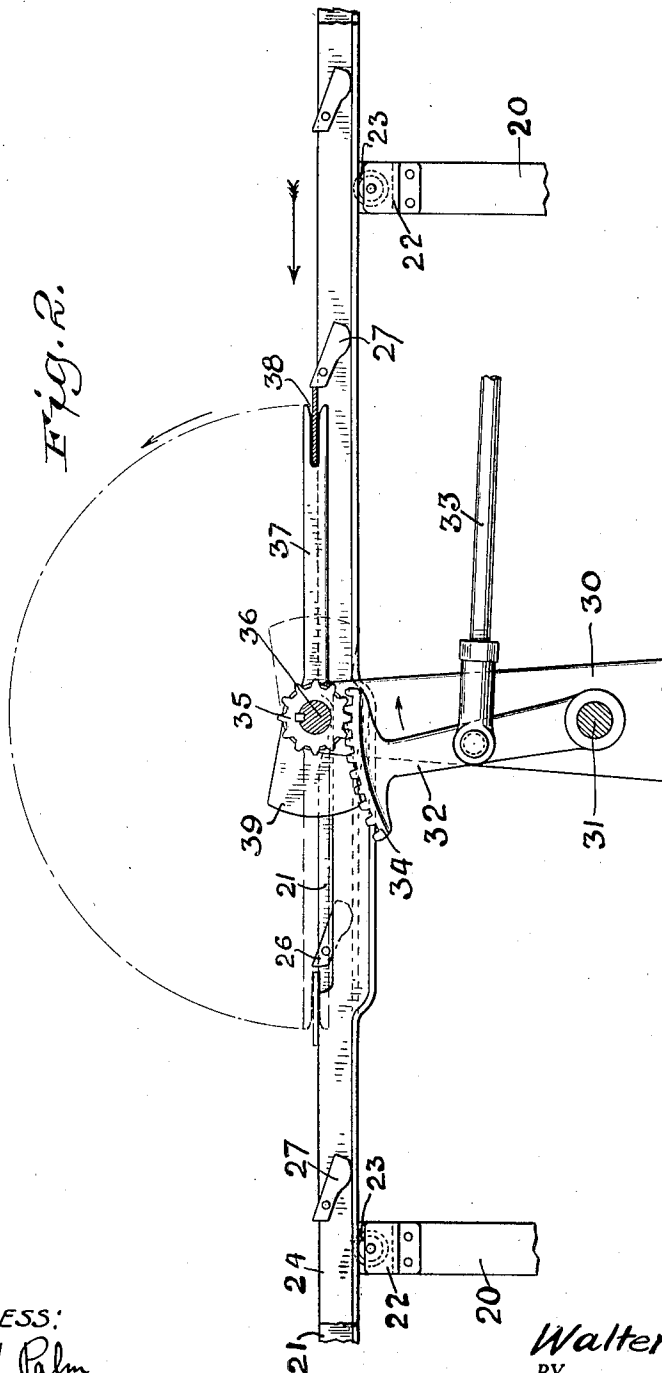
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WALTER E. RICHTER, OF WAUWATOSA, WISCONSIN, ASSIGNOR TO A. O. SMITH CORPORATION, OF MILWAUKEE, WISCONSIN, A CORPORATION OF NEW YORK.

BLANK-REVERSING DEVICE FOR DRAWING PRESSES.

Application filed November 12, 1923. Serial No. 674,255.

The present invention is constituted as an operating element of the side bar forming line of presses disclosed in Patent No. 1,477,778, granted December 18, 1923, to R. Stanley Smith, in which sets comprising curved right and left hand side bars for automobile or other vehicle frames are produced in regular sequence of pairs.

In the operation of the said side bar forming line, the longitudinally curved, flat metal blanks from which the right and left hand side bars are formed in alternation, are advanced by a conveyor mechanism in a regular step-by-step procession to positions in their line of travel from which points they are diverted to the drawing presses which turn the longitudinal margins of the blanks to form curved channel bars each composed of a web and flanges extending outwardly therefrom at one side of the web.

The two drawing presses employed for imparting the channel shapes to the respective side bars may be the same in structure and operation, but differ only in that they present a different or reverse arrangement of the dies, suitably disposed for the production of the two curved bars of a pair. But inasmuch as the longitudinally curved blanks, following the several preparatory operations, are advanced in the same relative order, that is, with their contours in the same position with relation to each other, and the two drawing presses have a reverse arrangement of the dies, it is necessary that each alternate longitudinally curved blank in the advancing line be turned over, so that its contour will conform to the arrangement of the dies of the drawing press which is to convert it into a curved channel bar.

By way of explanation of the advancing movement of the succession of curved blanks, it is assumed that the blanks may be consecutively numbered, for the purpose of illustration, and that the odd numbered blanks will be withdrawn or diverted from the path of their movement to the drawing press which forms the right hand side bar, and that the even numbered blanks will be withdrawn or diverted to the drawing press which forms the left hand side bar.

The present invention resides in devices which, after the odd numbered blanks have

been withdrawn from the conveyor and diverted to the right hand drawing press, are adapted to receive the even numbered blanks as presented singly by the conveyor mechanism and then operated to turn them over and deliver them again to the conveyor mechanism. The advancing movement of the even numbered blank in its reversed position is then resumed until such blank has reached the point where its diversion to the left hand drawing press occurs.

These turning or "flop-over" devices are simple in construction and efficient in operation, as will hereinafter be described. Their novelty will be pointed out in the appended claims.

In the drawings herewith:—

Figure 1 is a plan view showing in a conventional manner the conveyor mechanism for advancing the blanks, the devices which reverse the positions of alternate blanks as advanced by the conveyor, and the right and left hand drawing presses to which the blanks are in alternation diverted from their line of travel.

Fig. 2 is an enlarged view in elevation from the lower side of Fig. 1, showing the devices which effect reversal of the position of the alternate blanks.

Fig. 3 is a vertical sectional view transversely of the conveyor mechanism.

In the drawings, the right and left hand drawing presses indicated by the letters A and B, respectively, are shown as arranged at one side of the path of travel of the flat curved or otherwise contoured blanks which are to be converted into flanged side bars, in the operation of the said presses. The presses are suitably spaced apart so as to permit the proper location of the "flop-over" mechanism for the alternate blanks with relation to the distance by which the presses are separated.

The numerals 20 indicate posts for supporting parallel tracks 21, over which the flat blanks are moved edgewise in regular succession in a step by step procession. Brackets 22 attached to the posts adjacent the tracks 21, support rollers 23, upon which the conveyor or feeder C for the blanks may move. The said conveyor is formed of parallel rails 24 which are connected at intervals by means of tie rods 25, so as to constitute a frame. Both the tracks 21 and

the rails 24 may conveniently be formed as angle irons, upon the upstanding flanges of which the flat blanks rest and are supported in their travel laterally.

5 Pivoted dogs 26 are mounted intermediate their ends at equally spaced points in the length of the fixed tracks 21, the pivotal points thereof being nearer to the forward end, so that the longer ends act as
10 counterweights to raise the shorter ends and project them slightly above the top of the tracks. Movement of the curved blanks over the upwardly projecting forward portions of the dogs will rotate them about their
15 pivots so as to depress their upper ends below the plane of the tracks, and when the blanks in their forward movement have passed clear of the dogs, the normal positions of the latter under the influence of
20 gravity are resumed. In such normal positions, the dogs act as stops which prevent the retraction of the blanks due to frictional engagement with the rails 24 in the backward movement of the conveyor.

25 The rails 24 of the conveyor are provided with similarly shaped and mounted dogs 27 which act in the same manner as the dogs 26. In the forward movement of the conveyor, a blank in the engagement of the
30 dogs 27 therewith, will be advanced until it has been passed beyond a pair of oppositely arranged dogs 26, which will then act as described to prevent backward movement of the blank. The conveyor is then
35 retracted to engage its dogs with the next blank in the line at the rear, and upon the next forward feeding movement of the conveyor, the blank so engaged by the dogs 27 will be advanced as before, and these operations are repeated.

40 It will be seen that in the operation of the conveyor the blanks are advanced in a regular spaced succession, as indicated at the right of Fig. 1. When the first curved
45 blank in the procession arrives at station D in the path of its travel which is directly in line with the drawing press A, the said blank, and the odd numbered ones in the succession which follows, will be diverted from its course and fed into the
50 drawing press, by which it will be converted into a right hand bar. The feeding movement of the second blank, however, continues. Thus, the odd numbered blanks are withdrawn from the line of travel, while the alternating even numbered ones continue to move forwardly past the station at which the odd numbered blanks are diverted to the right hand drawing press.

For the reasons hereinbefore outlined, it is necessary to completely reverse the positions occupied by the second, fourth, sixth, and so on, blanks of the original procession, now reduced by the withdrawal of every other blank, and this action is at-

tained through the instrumentality of simple devices which will now be described.

A stand 30 is positioned under the conveyor at a point in line with the space separating the presses A and B. A stud 31
70 fixed in the said stand pivotally supports a radial arm 32 which is adapted to be oscillated through a short arc by means of a cam actuated connecting rod 33. The free end of the radial arm 32 is provided
75 with a sector gear 34. The latter meshes with the pinion 35 fastened upon a shaft 36 journaled in the stand 30. The shaft 36 is provided with a plurality of radial arms 37, slotted at their outer ends, in the manner indicated at 38 in Fig. 2. The slots
80 38 in the several arms 37 are maintained in alignment in a plane coincident with that of the surface of the tracks 21 and rails 24, so as to receive in single order the even
85 numbered contoured blanks when moved by the action of the conveyor. The cam now comes into action and through the link 33 and the intermediate parts, the arms 37
90 with the blank supported in the radial slots thereof are moved through an arc of 180° so as to deposit the said blank upon the tracks 21 and rails 24 at the other side of the shaft 36. In the next forward movement
95 of the conveyor, the said blank is pushed out of its engagement with the slots in the ends of the radial arms 37, and its forward feeding movement is continued until it is brought to station E in line with the forming press B. This blank, having
100 reached the end of its travel, is then diverted into the said forming press, and is converted into a left hand side bar.

In order to compensate for the weight of the radial arms and the curved blank
105 which is lifted thereby, the shaft 36 may be provided with counterweights 39, which will act to balance the movement of the parts, and render the operation smoother by lessening the vibrations which otherwise
110 would exist.

Although I have shown and described my invention for use in connection with drawing presses organized to form curved
115 flanged bars, it is obvious that the invention is not to be limited to the production of flanged bars of that particular form. The invention may be used in connection with the formation of straight flanged bars from rectangular blanks, or blanks having
120 any other contour, in which the perforations in the blanks do not appear in the same relative positions in the completed bars. Under such conditions it becomes
125 necessary, therefore, to reverse the position of one of the blanks of the succession before it is diverted to the drawing press, in order that a properly mated pair of flanged bars may be produced.

Nor is it intended to restrict the appli-
130

cation of my invention to an assembly in which separate drawing presses, as recited in some of the claims, are employed, for obviously a single press structure provided
5 with a plural number of sets of dies arranged and operated so as to convert the blanks into mated pairs of flanged bars will be within the scope of my invention.

Other changes in the structure herein disclosed may be made without departing from the spirit of my invention.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States, is:—

15 1. Separate drawing presses adapted to form mated flanged bars from sheet metal blanks, in combination with means for conveying a succession of blanks, and means for reversing the position of certain blanks
20 in the succession for proper presentation to the drawing presses.

2. Separate drawing presses adapted to form pairs of flanged bars from sheet metal blanks, in combination with conveying
25 means for moving a succession of blanks to the separate presses, and means for reversing the position of alternate blanks in the succession for proper presentation to the drawing presses.

30 3. Separate drawing presses adapted to form pairs of flanged bars from sheet metal blanks, in combination with a conveyor adapted to advance a succession of blanks in spaced relation, and means for reversing
35 the position of alternate blanks in the succession for proper presentation to the drawing presses.

4. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
40 blanks, in combination with a track upon which a succession of blanks is supported, a conveyor for advancing the blanks in spaced relation, and means for reversing the position of alternate blanks in the succession for
45 proper presentation to the drawing presses.

5. Separate drawing presses adapted to form pairs of flanged bars from sheet metal blanks, in combination with a track upon
which a succession of blanks is supported, a conveyor for advancing the blanks in spaced relation, means for holding the blanks in the positions to which they are moved by
the conveyor, and means for reversing the position of alternate blanks in the succession for proper presentation to the drawing
presses.

6. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
60 blanks, in combination with a track upon which a succession of blanks is supported, a reciprocating conveyor for advancing the blanks in spaced relation, means for holding the blanks in the positions to which they are moved by the conveyor, and means for reversing the position of alternate

blanks in the succession for proper presentation to the drawing presses.

7. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
blanks, in combination with a track upon
70 which a succession of blanks is supported, a conveyor for advancing a succession of blanks along the track, pivoted dogs mounted upon the track and adapted to hold the blanks against retractive movement, and
means for reversing the position of alternate blanks in the succession for proper presentation to the drawing presses.

8. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
blanks, in combination with a track upon
which a succession of blanks is supported, a reciprocating conveyor provided with upwardly projecting pivoted dogs for simultaneously advancing a succession of blanks
along the track, pivoted dogs mounted upon the tracks and adapted to hold the blanks against retraction in the rearward movement of the conveyor, and means for reversing the position of alternate blanks in
the succession for proper presentation to the drawing presses.

9. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
blanks, in combination with a track upon
which a succession of blanks is supported, a reciprocating conveyor provided with upwardly projecting pivoted dogs for simultaneously advancing a succession of blanks
along the track, pivoted dogs mounted upon
100 the tracks and adapted to hold the blanks against retraction in the rearward movement of the conveyor, the said dogs being counter-balanced so as to permit their depression by a blank thereover and to resume normal positions when free, and means for reversing the position of alternate blanks in the succession for proper presentation to the drawing presses.

10. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
blanks, in combination with conveying
110 means for moving a succession of blanks to the separate presses, and means for reversing the position of alternate blanks in the succession for proper presentation to the drawing presses, such reversing means comprising a shaft with radial arms provided with means thereon for receiving a
blank, and means for oscillating the said
120 shaft.

11. Separate drawing presses adapted to form pairs of flanged bars from sheet metal
blanks, in combination with conveying metal
125 for moving a succession of blanks to the separate presses, and means for reversing the position of alternate blanks in the succession for proper presentation to the drawing presses, such means comprising a shaft having radial arms provided with means
130

thereon for receiving a blank, means on the conveyor for supplying a blank to the radial arms, and means for oscillating the said shaft.

5 12. Separate drawing presses adapted to form pairs of flanged bars from sheet metal blanks, in combination with conveying means for moving a succession of blanks to the separate presses, and means for reversing
10 the position of alternate blanks in the succession for proper presentation to the drawing presses, such means comprising a shaft having radial arms provided with means
15 thereon for receiving a blank, means on the conveyor for supplying a blank to the radial arms, means for removing the blank from the radial arms, and means for oscillating the said shaft.

20 13. A blank feeding mechanism comprising a track upon which a succession of metal blanks is supported, a conveyor for advancing a succession of blanks along the track, in combination with means for reversing the position of certain of the blanks, such means
25 comprising a rock shaft provided with means for receiving the blank to be reversed, and means for rotating the rock shaft through an arc to reverse the position of the blank.

30 14. A blank feeding mechanism comprising a track upon which a succession of metal blanks is supported, a conveyor for advancing a succession of blanks along the track, in combination with means for reversing the position of certain of the blanks, such means
35 comprising a rock shaft extending transversely of the conveyor and provided with holding means adapted to receive a blank from the conveyor at one side of the rock shaft and deliver it to the conveyor at the
40 other side thereof, means on the conveyor for delivering the blank to the said holding means and removing it therefrom, and means for rotating the rock shaft through an arc to reverse the position of the blank.

45 15. A blank feeding mechanism comprising a track upon which a succession of metal blanks is supported, a conveyor for advancing a succession of blanks along the track, in combination with means for reversing the
50 position of certain of the blanks, such means comprising a rock shaft provided with radial arms having axially extending slots in the ends thereof for receiving a blank, means for entering a blank in the said slots at one

side of the said shaft and for removing it therefrom at the other, and means for oscillating the said shaft. 55

16. A blank feeding mechanism comprising a track upon which a succession of metal blanks is supported, a conveyor for advancing a succession of blanks along the track, in combination with means for reversing the position of certain of the blanks, such means comprising a rock shaft provided with radial arms having axially extending slots in the ends thereof for receiving a blank, means on the conveyor for entering a blank in the said slots at one side of the said shaft and for removing it therefrom at the other, and means for oscillating the said shaft. 60 65 70

17. A blank feeding mechanism comprising a track upon which a succession of metal blanks is supported, a conveyor for advancing a succession of blanks along the track, in combination with means for reversing the position of certain of the blanks, such means comprising a rock shaft provided with radial arms having axially extending slots in the ends thereof for receiving a blank, means for entering a blank in the said slots at one side of the said shaft and for removing it therefrom at the other, means for oscillating the said shaft, and a counterweight on the shaft for the said radial arms. 75 80 85

18. Separate drawing presses adapted to form reversely flanged bars from a succession of metal blanks of like contour, in combination with means for conveying the succession of blanks to the presses, and means for removing certain of the blanks from the conveyor and restoring them thereto in reversed position for proper presentation to the drawing presses. 90

19. Two separated drawing presses adapted to form reversely flanged bars from a succession of metal blanks of like contour, in combination with means for conveying the succession of blanks to the presses, and means for removing alternate blanks from the conveyor and restoring them thereto in reversed position for proper presentation to the drawing presses. 95

In testimony whereof, I have signed my name at Milwaukee, this 9th day of November, 1923.

W. E. RICHTER.