

March 30, 1943.

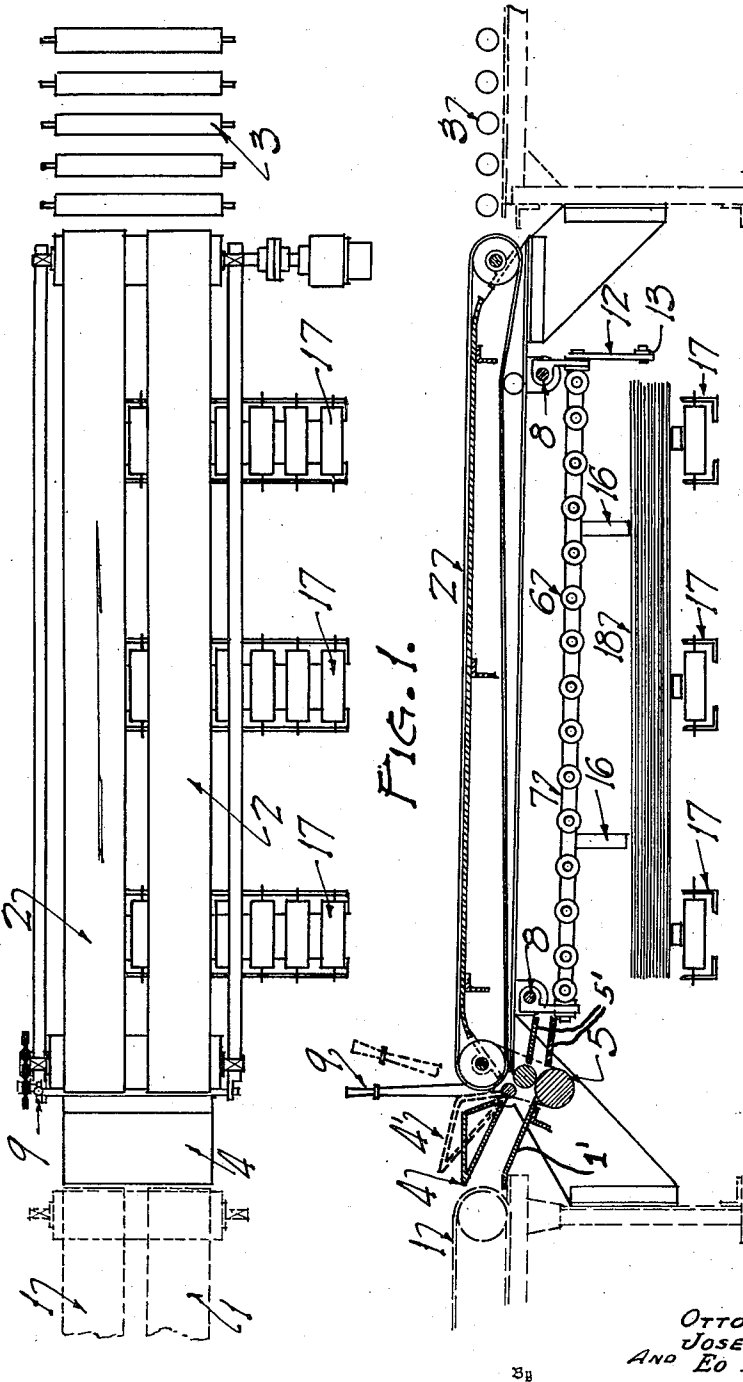
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2,315,003

SHEET SORTING TABLE

Filed May 21, 1940

4 Sheets-Sheet 1



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SHEET SORTING TABLE

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4 Sheets-Sheet 2

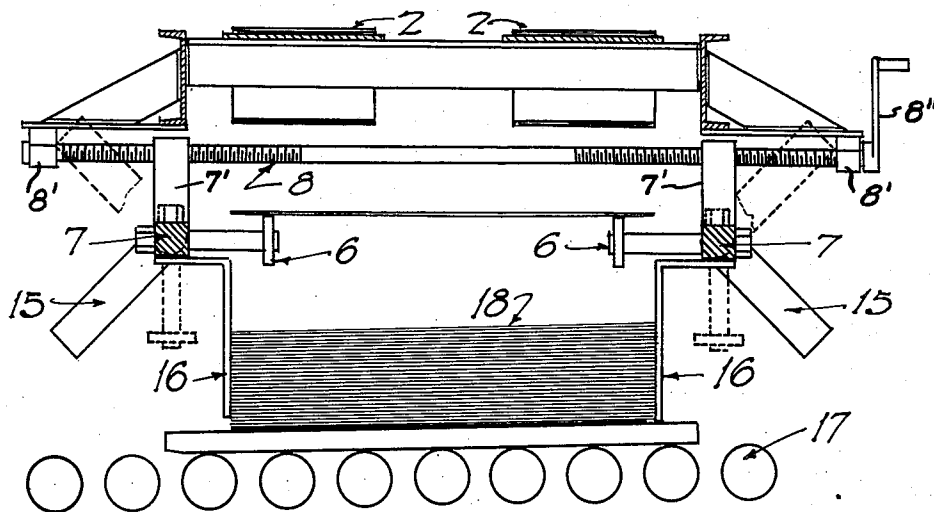


FIG. 3.

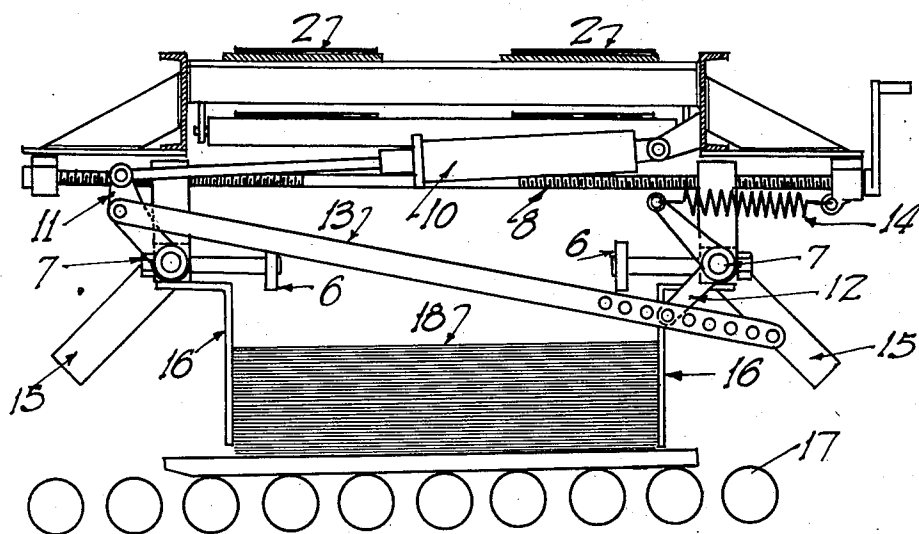


FIG. 4.

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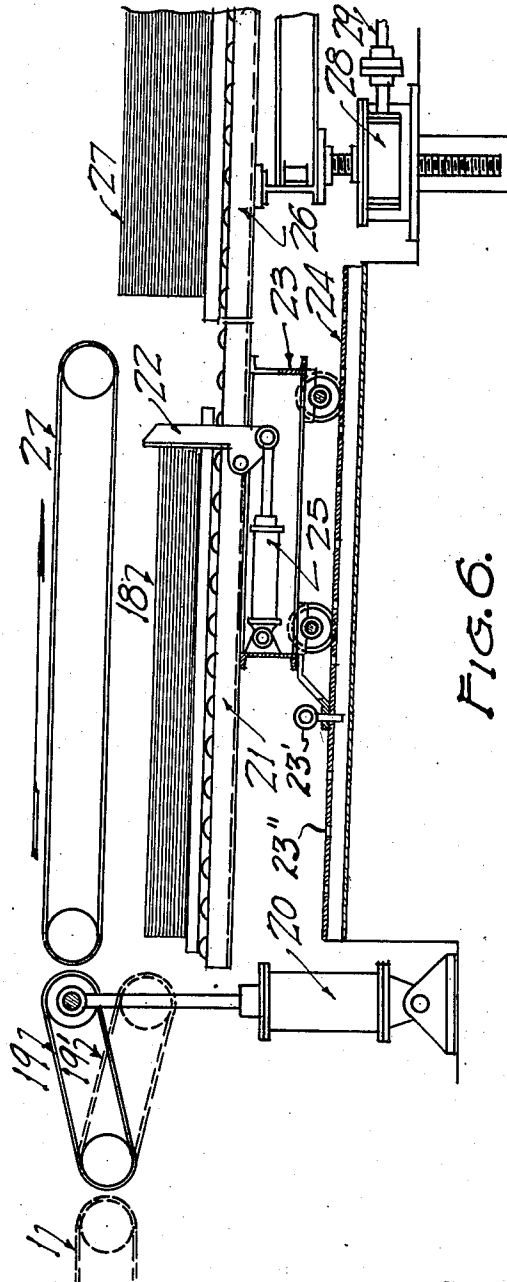
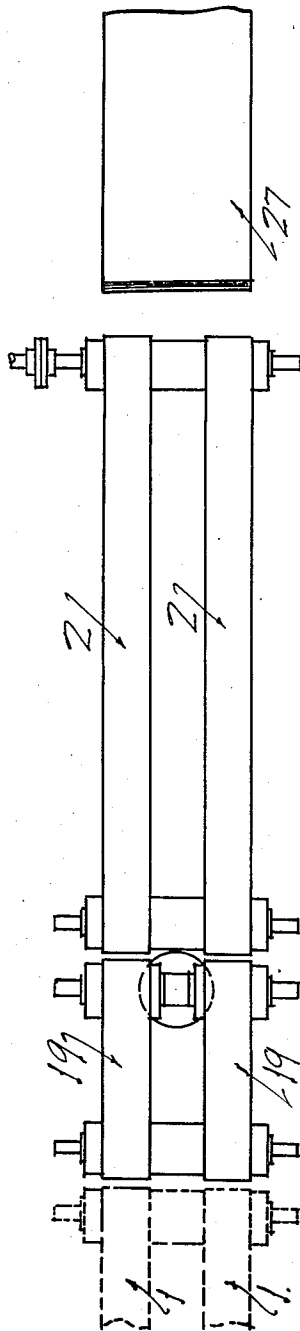
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SHEET SORTING TABLE

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4 Sheets-Sheet 3



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SHEET SORTING TABLE

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4 Sheets-Sheet 4

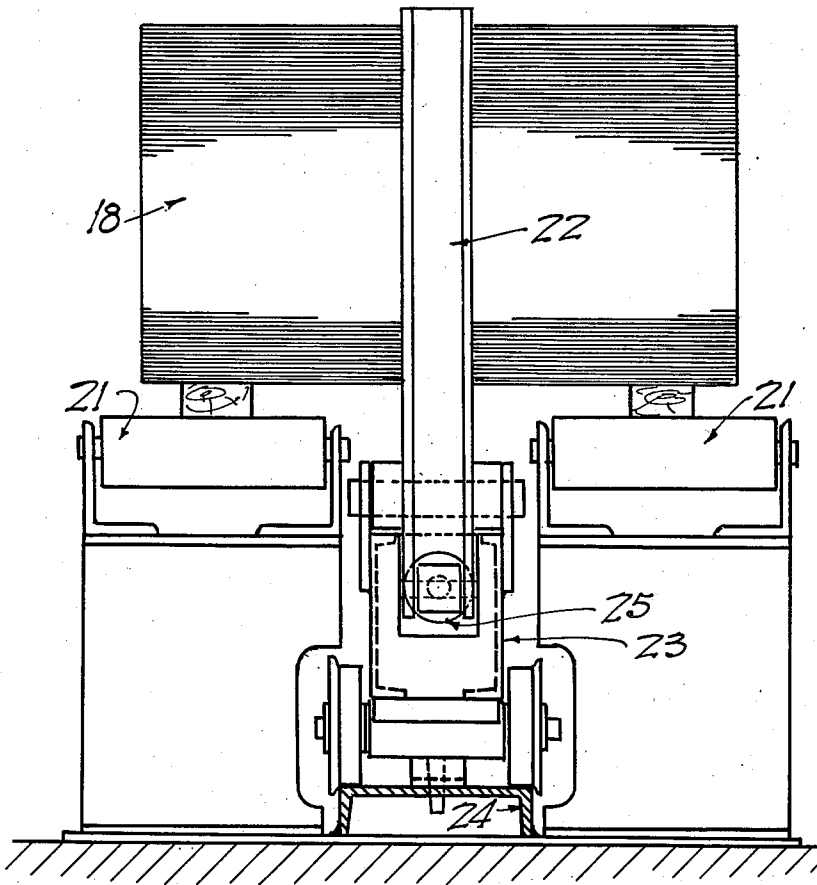


FIG. 7.

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UNITED STATES PATENT OFFICE

2,315,003

SHEET SORTING TABLE

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Application May 21, 1940, Serial No. 336,420

5 Claims. (Cl. 214—11)

This invention relates to sorting tables for sorting or by-passing off grade sheets, as for example, of metal, following the various manufacturing steps such as shearing, liming or the like. It is desirable to have a position in the production line where an inspector may inspect the sheets as they pass and sort out the off grade sheets from the prime sheets.

Various devices have been suggested for this purpose in the past but all devices and methods with which we are familiar have necessitated the stopping of the mechanism for each sorting and have resulted in the handling of the sorted sheets in small units, all of which contributed to the expense of the operation and tended to slow up production.

In the various production steps performed on sheet metal the sheets are often conveyed longitudinally at speeds as high as 300 feet per minute or more, on suitable conveyors and having in mind the desirability of providing means and mechanism whereby a sorting operation may be carried on without interrupting or slowing down the flow of production, it is an object of our invention to provide an arrangement whereby sheets may be sorted, i. e. off grade sheets may be separated out from the flow of prime sheets into a separate pile which may then be disposed of in a suitable manner. It is another object of our invention to provide an arrangement whereby the off grade sheets after having been piled in a suitable pile may be caused to follow the prime sheets on the same conveyor. Another object of our invention is to provide an arrangement whereby the off grade sheets may be shunted off to the side for disposal in any suitable way.

These and other objects of our invention which will be pointed out more in detail hereinafter or which will appear to one skilled in the art upon reading these specifications, we accomplish by that construction and arrangement of parts of which we shall now describe two exemplary embodiments. Reference is made to the drawings forming a part hereof and in which:

Figure 1 is a plan view of one embodiment of the invention;

Fig. 2 is a central longitudinal sectional view of the same;

Fig. 3 is a transverse cross sectional view showing the adjustment means for the dropping table;

Fig. 4 is a similar view showing the mechanism for operating the dropping table;

Fig. 5 is a plan view of a second embodiment of the invention;

Fig. 6 is a central longitudinal sectional view of the same; and

Fig. 7 is an end view showing the air operated stop, as seen from the right in Fig. 6.

Briefly in the practice of our invention, we provide in the conveyor train a sorting station at which sheets may be caused to follow one or the other of two paths. In one embodiment of the invention the prime sheets pass directly over the sorting table while the off grade sheets are shunted to a position below, from which they may be removed sidewise. In another embodiment, we provide means for causing the prime sheets to pass over an intermediate conveyor to a vertically adjustable conveyor while the off grade sheets are shunted to another intermediate conveyor where they are held until the pile of prime sheets arrive whereupon they may follow the prime sheets on the same conveyor.

Referring now particularly to Figs. 1 to 4 inclusive, we have shown an approach conveyor at 1, upon which the sheets are brought to a sorting station from some preceding operation. The prime sheets are conveyed by the belts 2 to the conveyor 3. Between the conveyors 1 and 2, we have provided a pivotally mounted deflector 4 normally occupying the position shown in solid lines but movable by means of the hand lever 9 to the position indicated in broken lines at 4'. We have shown at 5 a pair of pinch rolls arranged to take off grade sheets which have been shunted downwardly and pass them on to the dropping table 6. Between the conveyor 1 and the pinch rolls 5 we have provided a guide plate 1'. It will be observed that the deflector 4 is of generally triangular cross section, whereby it need only be raised a slight amount to deflect off grade sheets sharply downward onto the guide plate 1', and thus to the pinch rolls 5. Guide plates 5' may be provided between the pinch rolls 5 and the dropping table 6.

Inasmuch as the conveyors 1, 2 and 3 may be of conventional form, we have not described them in detail as to their drive or mounting.

The dropping table comprises a plurality of rollers arranged in two parallel lines as clearly seen in the figures, each assembly of rollers being arranged to pivot on the shafts 7. The shafts 7 are mounted in members 7' which are provided with threaded bores which engage the right and left hand threads respectively on the adjusting shaft 8, which is suitably mounted in bearings 8'. A handle member or the like 8'' is fixed on the shaft 8. It will be clear that as the handle 8'' is turned, the assembly of

rollers 6 will be caused to approach each other or to recede from each other and the purpose of this adjustment is to allow for the sorting of various widths of sheets.

The shafts 7 are operated by means of an air cylinder 10 through levers 11 and 12, and the link rod 13. A spring 14 connected to the bell crank lever 12 and to a part of the frame maintains the shaft 7 so that the rolls 6 occupy the position shown in solid lines. The shafts 7 are provided with counter weights 15 and with side piling guides 16. When air is exhausted from the cylinder 10 the shafts 7 pivot so that the assembly of rolls 6 occupy the dotted line position shown in Fig. 3.

As will be clear from the drawings, the off grade sheets are piled at 18 on the transverse conveyor 17 upon which they may be moved in a sidewise direction.

In the embodiment of Figs. 5 to 7 inclusive, we have again shown an approach conveyor 1 and sorting table at 2. In this case, however, we have utilized an intermediate conveyor arranged for pivotal movement from a solid position at 19 to a broken line position at 19'. This intermediate conveyor 19 is actuated by air cylinder 20. The intermediate conveyor 19 corresponds to the deflector 4 discussed above.

The prime sheets pass over the conveyor 2 to the conveyor 26, which is vertically adjustable by means of screw jacks 28 which may be worm driven by the shaft 29 from some suitable source of power. At the beginning of the operation the conveyor is elevated to a position slightly below the belt 2 and is gradually moved downwardly as the pile of sheets increases. The off grade sheets are shunted by means of the deflector 19 onto the conveyor 21 and are piled as shown at 18. We have provided an air operated stop 22 mounted upon the adjustable car 23 positioned on the channel 24. The stop 22 is operated by the air cylinder 25 to permit the packing of off grade sheets 18 to move over the conveyor 21 onto the conveyor 26 as the pack of prime sheets 27 moves to a new position. The car 23 is positioned for various lengths by means of a pin 23' which may be inserted in any one of a number of holes 23'' in the channel 24.

It will thus be clear that we have devised a sorting table which will not interfere with or slow up production and by means of which off grade sheets may be stripped off at any desired place or they may be caused to follow the path of prime grade sheets to some succeeding point.

It will be clear that numerous modifications may be made in our invention, which will be apparent to those skilled in the art, and we do not intend to limit ourselves except as pointed out in the claims which follow.

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

1. In combination with a conveyor system for metal sheets, a sorting means comprising an intermediate conveyor spaced from an approach conveyor, a deflector disposed in said space and movable from a position in which it passes sheets onto said intermediate conveyor to a position in which it passes sheets to a point beneath said

intermediate conveyor, a second intermediate conveyor disposed beneath said first intermediate conveyor, and a run-off conveyor disposed to receive sheets from said intermediate conveyors, said run-off conveyor being adjustable vertically from a position in which it may receive sheets passing off said first intermediate conveyor to a position in which it may receive sheets passing off said second intermediate conveyor, all of said conveyors extending and moving in the same direction, and stop means in connection with said second intermediate conveyor to arrest sheets deflected thereto and form a stack of said sheets.

2. The combination according to claim 1 in which said run-off conveyor is arranged to move gradually downward from its position to assist in the formation of a stack thereon from sheets moving over said first intermediate conveyor, until it reaches a second position in which, after said stack formed thereon has been moved away, the stack formed in connection with said second intermediate conveyor may follow said first stack on said run-off conveyor.

3. The combination according to claim 1 in which said run-off conveyor is arranged to move gradually downward from its position to assist in the formation of a stack thereon from sheets moving over said first intermediate conveyor, until it reaches a second position in which, after said stack formed thereon has been moved away, the stack formed in connection with said second intermediate conveyor may follow said first stack on said run-off conveyor, said stop means in connection with said second intermediate conveyor being adjustable in accordance with sheet length.

4. The combination according to claim 1 in which said run-off conveyor is arranged to move gradually downward from its position to assist in the formation of a stack thereon from sheets moving over said first intermediate conveyor, until it reaches a second position in which, after said stack formed thereon has been moved away, the stack formed in connection with said second intermediate conveyor may follow said first stack on said run-off conveyor, said stop means in connection with said second intermediate conveyor being pivotally mounted on a car, said car riding upon a channel, and being adjustable to any one of a plurality of positions.

5. The combination according to claim 1 in which said run-off conveyor is arranged to move gradually downward from its position to assist in the formation of a stack thereon from sheets moving over said first intermediate conveyor, until it reaches a second position in which, after said stack formed thereon has been moved away, the stack formed in connection with said second intermediate conveyor may follow said first stack on said run-off conveyor, said stop means in connection with said second intermediate conveyor being pivotally mounted on a car, said car riding upon a channel, and being adjustable to any one of a plurality of positions, and pneumatic means for actuating said stop means.

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