Dec. 23, 1952 F. K. SCHEFE 2,622,876

APPARATUS FOR PILING SHEETS

Filed May 20, 1947 3 Sheets-Sheet 1

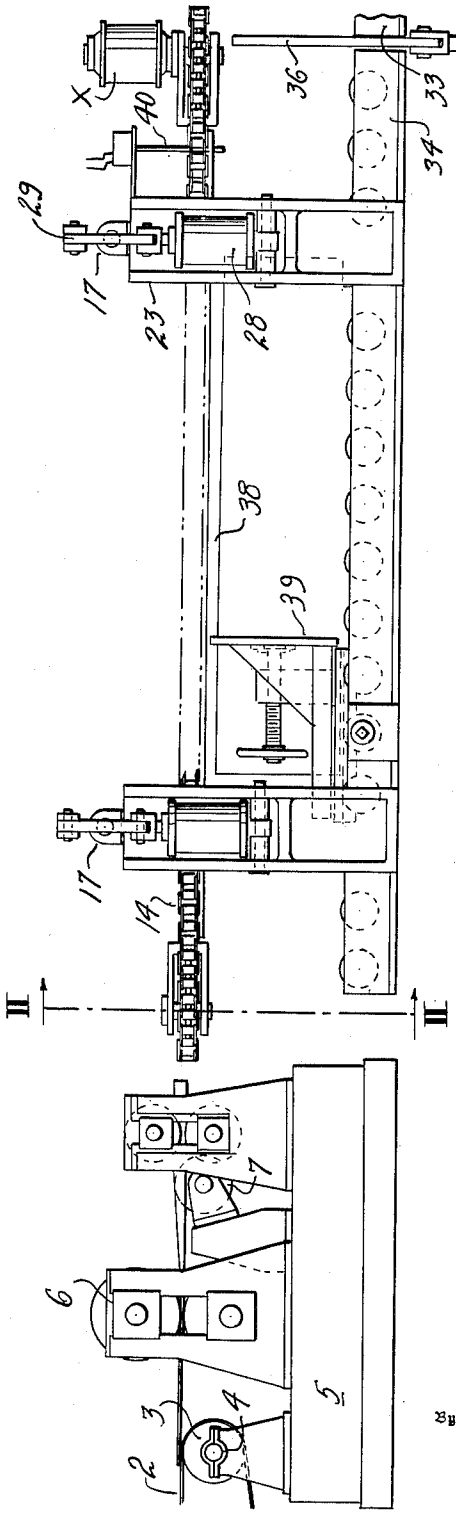


Fig. 1.

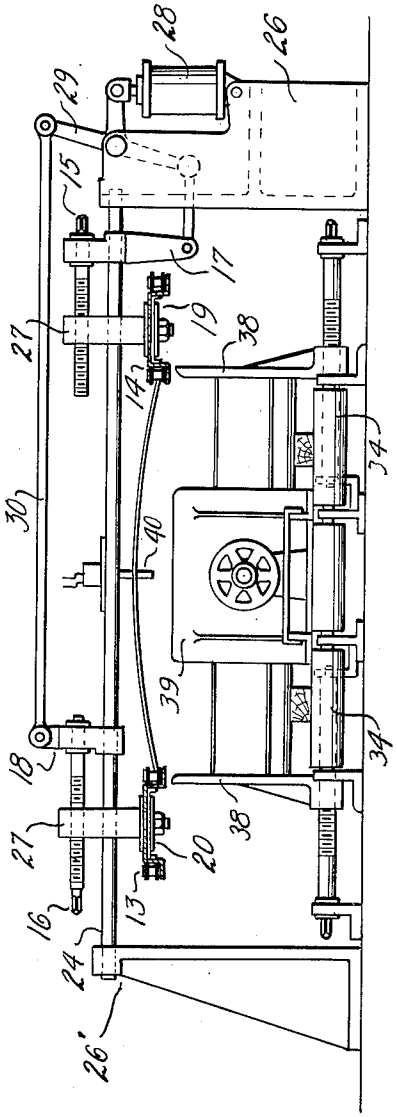


Fig. 2.

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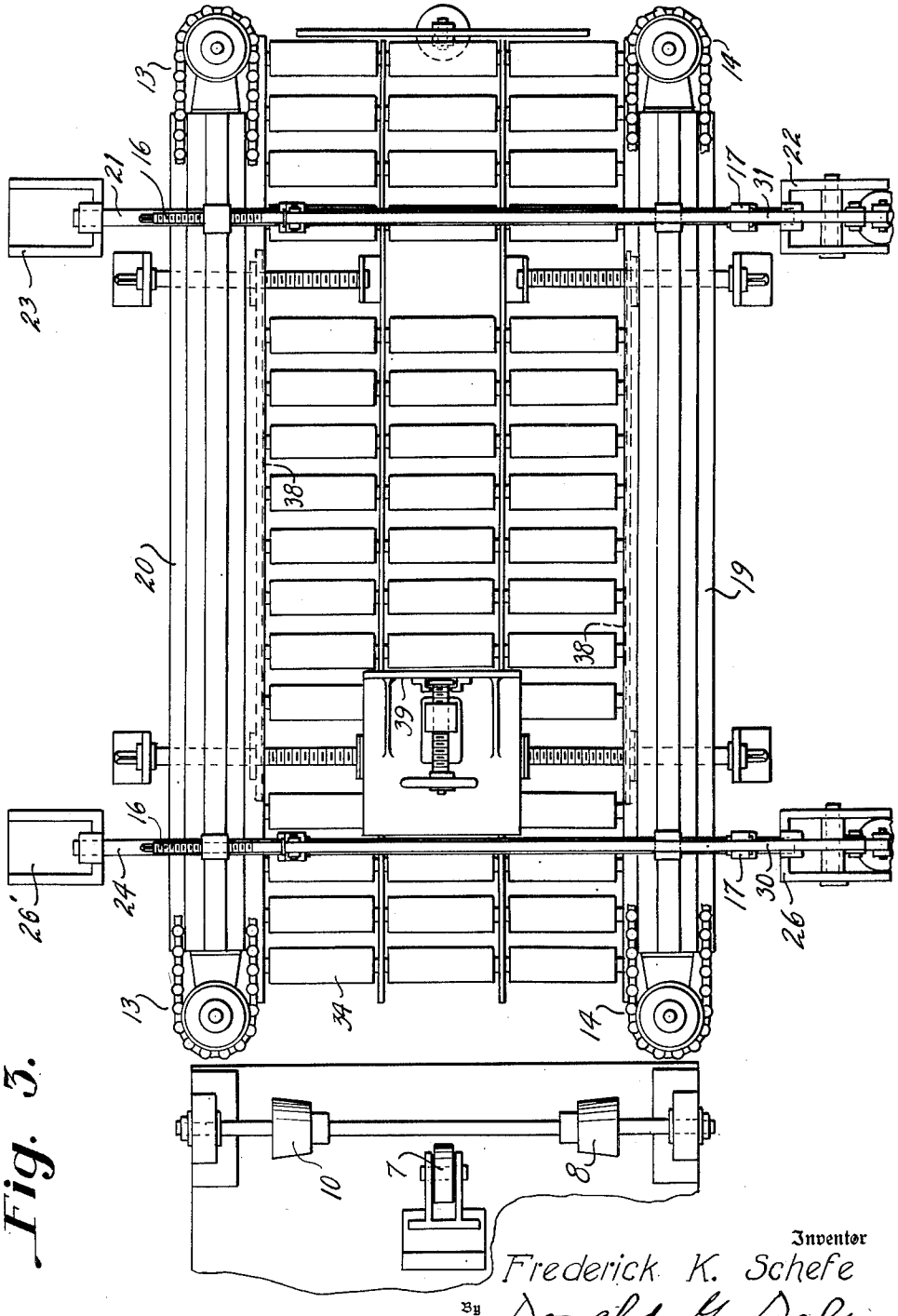


Fig. 3.

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APPARATUS FOR PILING SHEETS

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Fig. 4.

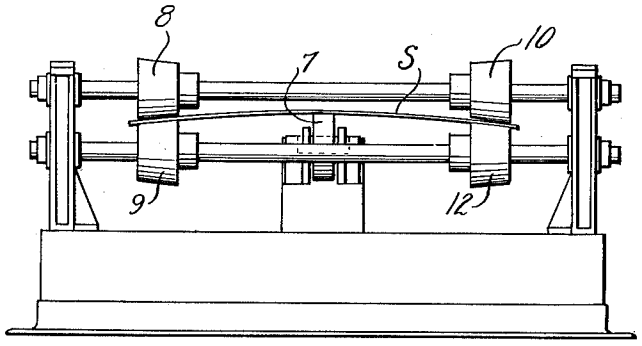
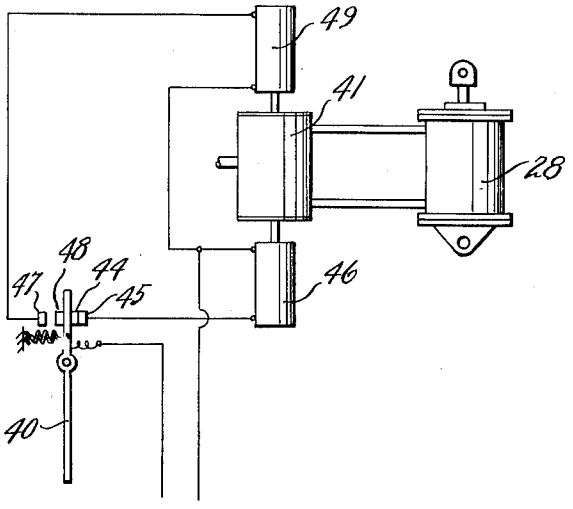


Fig. 5.



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Patented Dec. 23, 1952 2,622,876

UNITED STATES PATENT OFFICE

2,622,876

APPARATUS FOR PILING SHEETS

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Application May 20, 1947, Serial No. 749,194

5 Claims. (Cl. 271—68)

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This invention relates to the piling of sheets and more particularly to an improved apparatus for accomplishing the same.

It has long been a difficult problem to pile sheets (especially metallic sheets) in a rapid and efficient manner without damaging the same. This is particularly true with respect to the sheets of larger size. Various types of pilers and conveyors have been proposed and used but proved unsatisfactory for the reason that they tended to scratch or bend the sheets which, of course, is objectionable.

The present invention has among its objects the provision of an efficient apparatus for piling sheets by means of which sheets can be rapidly piled without damage to them.

Another object is to provide an apparatus of the class described which is simple and inexpensive to construct, use and maintain.

According to the teachings of the present invention, the sheets to be piled, however large, are held in bowed condition by conveying means, delivered to a predetermined point while maintained in such bowed condition, then dropped and guided to a point therebelow so that they (the sheets) are neatly piled one on top of the other, thereby avoiding any danger of scratching or bending the sheets.

The invention, then, comprises the features hereinafter fully described and as particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative of several of the number of ways in which the principles of the invention may be employed.

In said drawings:

Figure 1 is a side elevational view of the improved sheet piling apparatus of my invention;

Figure 2 is an elevational view on the line II—II of Figure 1;

Figure 3 is a plan;

Figure 4 is an end elevational view showing the means for initially imparting a bowed condition to the sheets;

Figure 5 is a schematic diagram showing a control circuit which may be utilized in connection with the apparatus of the invention.

Referring more particularly to the drawings there is shown a conventional type of belt conveyor having a belt 2 and pulley 3, the latter being supported in bearings 4 mounted on a base 5. The conveyor of Figure 1 may be disposed at the end of a flying shear line in which the metallic sheets are cut to length and delivered

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therefrom in spaced relationship. From the belt 2, sheets are fed into a pinch roll or oiling machine 6 which discharges them forwardly over a roll 7 which causes the leading end of the sheet to bow upwardly in the center.

Spaced beyond roll 7 are two pairs of conical rolls 8, 9 and 10, 12 (see Figure 4) for receiving the bowed sheet and feeding the same while still in bowed condition to a pair of parallel endless conveyor chains 13 and 14 which are driven at the desired operating speed by variable speed motors X. The chains 13 and 14 are adjustably positioned in parallelism by means of screws 15 and 16 secured in slides 17 and 18 to accommodate different sheet widths and maintain the bowed shape of the sheets while they are being conveyed.

As shown more clearly in Figure 2, chains 14 and 13 travel on spaced horizontal trackways 19 and 20.

Spaced horizontal bars 21 and 24 extend transversely above endless chains 13 and 14. Bar 21 is supported at each of its ends by a vertical stand as at 22 and 23. Bar 24 is supported at each of its ends by a second pair of vertical stands 26—26'. These bars 21 and 24 provide a means for slidably mounting the slides 17 and 18 which are adjustably attached to hanger posts 27 for the trackways 19 and 20, which are themselves slidably movable along the bars 21 and 24.

Reciprocating movement is imparted to the two trackways for the endless chains 13 and 14 by means of air cylinders 28 and inter-connecting cranks 29 and rods 30 and 31, which function in a manner to be later described.

Standard roller conveyor sections 33 and 34 are provided to receive the piled sheets; and an air-operated stop 36 is positioned as shown in Figure 1 to restrain the forward movement of the sheets as they are released from the parallel endless conveyor chains.

To assist in guiding the sheets while piling them, adjustable guides 38 are positioned as shown lengthwise of the roller conveyor sections 33 and 34. Completing the piling arrangement is an adjustable back-stop 39 loosely mounted on the tops of the rollers in the conveyor section 34.

In operation, the bowed sheet S passes through and from rolls 8 to 12 inclusive, and is caused to pass between the parallel endless chains 13 and 14 which are traveling at the same rate of speed. A switch lever 40 is disposed in the path of movement of the sheet S (as shown in Fig-

ure 1) and when the forward end of the moving sheet strikes the lever it closes an electrical circuit to a solenoid-operated valve mechanism 41 (see Figure 5). The valve thereupon admits air to the cylinders 28, whereby the crank 29 and the rods 30 and 31 cause instantaneous separating movement of the two endless chains 13 and 14 and the sheet drops to the pile.

In Figure 5 it should be noted that contacts 44 and 45, which are normally closed, energize a solenoid 46 which operates the valve 41 to admit air to one end of the cylinder 28 and thus keep its piston retracted. This condition retains the endless conveyor chains 13 and 14 in what may be considered closed position whereby the conveyed sheet is maintained in bowed shape.

When the sheet strikes the lever 40, contacts 44 and 45 separate and break the electrical circuit to valve 41 which relieves the air pressure previously established in the cylinder 28. At this same instant contacts 47 and 48 close the circuit to a solenoid 49 which operates the valve 41 to admit air to the opposite end of the cylinder 28 whereupon, through the cranks 29, rods 30, etc., the endless chains 13 and 14 will immediately open, or retract, from their previously held positions against the edge of the sheet being conveyed. The retracting action will be amplified somewhat by the inherent stiffness in the sheet which is created by the bowed shape imparted to it.

As the endless chains 13 and 14 retract, the sheets assume a natural flat shape and drop by gravity to the pile, being guided into alignment by the stop 39 and guides 38. The lever 40 also returns to normal position and contacts 44 and 45 close the electrical circuit to the valve 41 which function to return the endless conveyor chains 13 and 14 to closed position as described previously.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of my invention as defined in the following claims.

I claim:

1. In apparatus for piling sheets, the combination with means for delivering sheets singly in succession and means for bowing each sheet transversely so it is arched upwardly at the center, of a pair of spaced parallel conveyors initially positioned to receive the bowed sheet between them and maintain it in such condition, and means mounting at least one of the conveyors for lateral movement away from the other, whereby to permit the sheet to flatten and fall on a pile when properly positioned thereover.

2. In a sheet piler, a pile support, spaced parallel bars extending transversely above the support, hangers slidable on said bars, a pair of conveyors extending above the support, one along each side thereof and suspended from said hangers, and power means for shifting the hangers of one conveyor laterally toward and from the other conveyor.

3. In a sheet piler, a pile support, a pair of spaced parallel conveyors above the support adapted to be engaged by the edges of an approaching sheet, spaced parallel bars extending transversely above the support, said conveyors being suspended from said bars, and hangers for at least one of said conveyors slidable on said bars.

4. The apparatus defined by claim 3 characterized by hangers for both conveyors slidable on said bars and common means for moving the conveyors toward and from each other.

5. The apparatus defined by claim 4 characterized by said means including levers pivoted at one side of the support, and cross links extending from each lever to the hangers of each conveyor.

FREDERICK K. SCHEFE.

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