June 24, 1930. A. D. EVANS ET AL 1,767,442

SHEET PACKING APPARATUS

Filed May 22, 1928 2 Sheets-Sheet 1

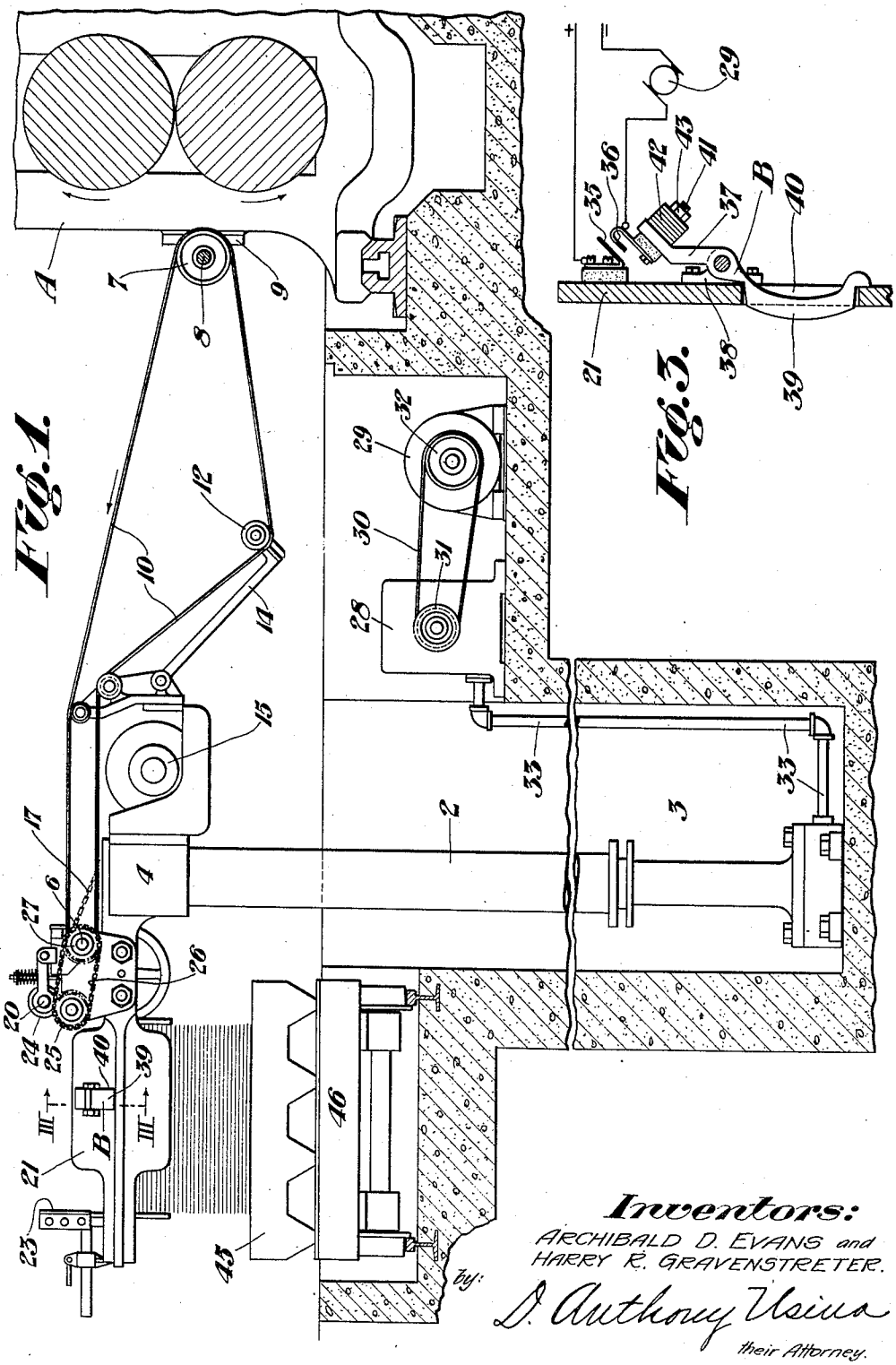


Fig. 1.

Fig. 3.

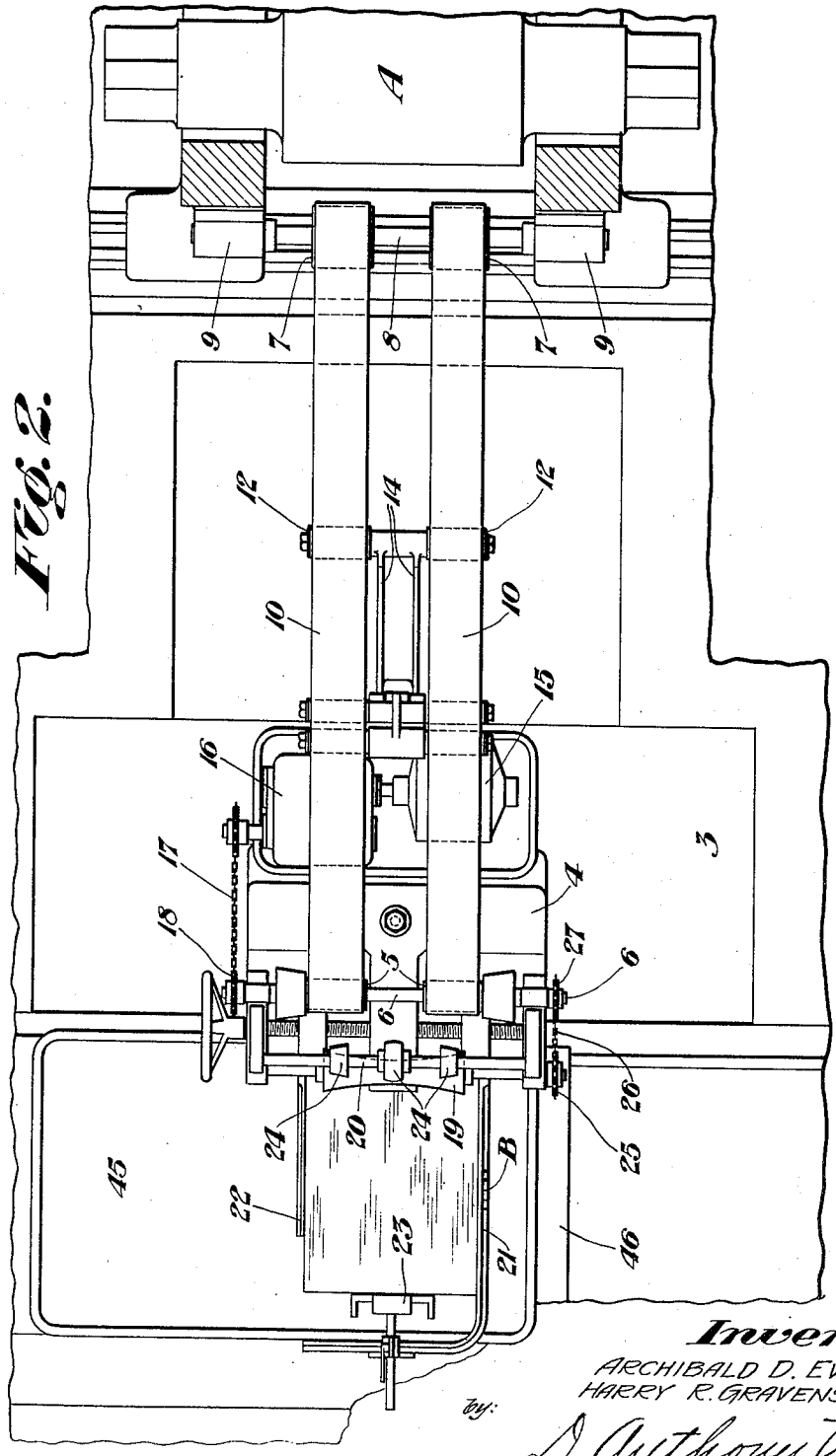
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Fig. 2.



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Patented June 24, 1930 1,767,442

UNITED STATES PATENT OFFICE

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SHEET-PACKING APPARATUS

Application filed May 22, 1928. Serial No. 279,825.

This invention relates to sheet handling apparatus and, while not limited thereto, relates more specifically to a cold mill packer for piling cold rolled sheets or plates, and has for one of its objects the provision of an improved apparatus of this type which will deliver the sheets with a minimum drop onto the pile.

Another object is to provide an apparatus which will be automatically raised as the pile is formed so as to permit the forming of standard height piles.

A further object is to provide an apparatus having the novel design, construction and combination of parts hereinafter described and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a side elevation of a sheet packing apparatus constructed in accordance with this invention.

Figure 2 is a plan view thereof.

Figure 3 is a fragmentary sectional detail taken on the line III—III of Figure 1, showing the details of the control switch.

Referring more particularly to the drawings, the numeral 2 designates a vertically disposed hydraulic cylinder which is mounted in a pit 3 and supports a horizontal frame 4.

Suitable conveyer head pulleys 5 are secured on a shaft 6 journaled in the frame 4 and suitable conveyer tail pulleys 7 are secured on a shaft 8 journaled in supports 9 adjacent the discharge side of a cold mill A.

Conveyer belts 10 are trained around the pulleys 5 and 7 and are tensioned by tensioning pulleys 12 carried by swinging levers 14.

A motor 15 is mounted on the frame 4 and is connected through a speed reducer 16 and chain 17 with a sprocket 18 on the conveyer head pulley-shaft 6.

A piling mechanism is supported on the frame 4 forward of and adapted to receive the sheets from the conveyer and comprises feed-out rollers 19 and 20 journaled in the frame 4, guide-members 21 and 22, and a stop-plate 23.

The lower feed-out roller 19 is concave in the direction of its axis and the upper roller 20 consists of a shaft having three spaced disks 24 thereon of varying diameters to follow the contour of the roller 19.

The lower feed-out roller 19 has a sprocket 25 on its shaft which is connected by a chain 26 to a sprocket 27 on the head pulley-shaft 6.

The hydraulic cylinder 2 is adapted to receive fluid from a standard oil gear hydraulic pump 28 which is driven by an electric motor 29. The motor 29 is connected to the pump 28 by a drive-chain 30 trained over sprockets 31 and 32. A pipe line 33 extends from the pump 28 to the cylinder 2 through which the fluid is forced.

The motor 29 is adapted to be controlled by a switch B, mounted on the guide-member 21, and operated by the sheets as they pass between the guides 21 and 22 to the pile.

The switch B comprises a fixed contact member 35, mounted on the guide-member 21, and a movable contact member 36 mounted on the upper end of a lever 37 pivotally mounted on brackets 38 secured on the guide-member 21. The lower end of the lever 37 is curved to form a cam portion 39 which projects through an opening 40 in the guide 21 into the path of the sheets as they move downwardly between the guides 21 and 22. The upper end of the lever 37 is provided with a counter-weight rod 41 on which a plurality of weight members 42 are removably secured by a nut 43.

The sheets delivered through the piling mechanism are shown forming a pile on an annealing box bottom 45 mounted on a truck 46.

In operation, as the sheets emerge from the cold mill A they pass onto the conveyer belts 10 and are conveyed forwardly into the vite of the feed-out rollers 19 and 20 which, due to their shape, will cause the sheets to be bent or flexed transversely so as to stiffen said sheets as they are fed from between the rollers, thereby causing said plates to be discharged on a substantially

horizontal plane between the guides 21 and 22.

As the sheets are projected outwardly between the guides 21 and 22, they will strike the stop plate 23 and then fall by gravity onto the pile.

As the sheets fall between the guides 21 and 22, they will engage the cam portion 39 of the switch lever and remain in engagement therewith until a sufficient number of sheets have accumulated to overcome the effect of the counter-weights 42, at which time the lever 37 will be rocked about its pivotal mounting to cause the contacts 35 and 36 to engage, thereby completing the circuit to the motor 29 which will operate the pump 28 and force more fluid into the cylinder 2, so as to cause said cylinder and the frame 4 and its associated mechanism to rise. The switch B will remain in circuit closing position only momentarily until the sheets have moved past the lever 37, when the circuit will be automatically broken and the motor 29 and pump 28 will stop. Thus the cylinder 2 and the mechanism supported thereby will be elevated in a step-by-step manner.

After the cylinder has been elevated as far as necessary to complete a pile of sheets, and it is desired to lower the mechanism in readiness to form a new pile, a suitable by-pass valve, which is a part of the standard hydraulic oil gear pump 28, is opened to permit the fluid to return from the cylinder 2 to a reservoir which forms a part of said pump unit.

One of the main advantages of this apparatus is that the sheets may be delivered at approximately the same distance from the pile at all heights of the piles and, therefore, the fall or delivery of the sheets may be readily controlled.

While we have shown and described one specific embodiment of our invention, it will be understood that we do not wish to be limited thereto since various modifications may be made without departing from the scope thereof as defined in the appended claims as, for instance, the mechanism for elevating the frame may be overhead instead of in a pit, other sources of power may be used, and various other equivalents substituted for different parts of the apparatus.

We claim—

1. A cold mill packer comprising a vertically movable support, a sheet feeding conveyor having its delivery end carried on said support, a piling mechanism carried by said support, said piling mechanism including a series of stationary guides for guiding the sheets onto a pile and cooperating concave and convex rolls adapted to feed the sheets horizontally between said guides, means for moving said support vertically, and means operable by the sheets as they pass downwardly between said guides for automatically controlling said means for moving said support.

2. A cold mill packer comprising a vertically movable support, a sheet feeding conveyor having its delivery end carried on said support, a piling mechanism carried by said support, said piling mechanism including a series of stationary guides for guiding the sheets onto a pile and cooperating concave and convex rolls adapted to feed the sheets horizontally between said guides, electrically operated means for moving said support vertically, and a switch operable by the sheets as they pass between said guides for controlling said means for moving said support.

3. A cold mill packer comprising a vertically movable support, a sheet feeding conveyor having its delivery end carried on said support, a piling mechanism carried by said support, said piling mechanism including a series of guides for guiding the sheets onto a pile and cooperating concave and convex rolls adapted to feed the sheets horizontally between said guides, electrically operated means for moving said support vertically, and a switch operable by the sheets as they pass between said guides for controlling said means for moving said support, said switch including an operating lever pivotally mounted on one of said guides and having one end extending into the path of travel of the sheets as they pass between said guides, a contact carried by the other end of said lever, and a counter-weight carried by the contact end of said lever.

4. A cold mill packer comprising a fluid pressure cylinder, a supporting frame mounted on and adapted to be moved vertically by said cylinder, a sheet feeding conveyor having its delivery end carried on said supporting frame, a piling mechanism mounted on said frame, said piling mechanism including a series of guides for guiding the sheets onto a pile, an electrically operated pump for providing fluid under pressure to said cylinder to elevate said cylinder and said frame, and a switch operable by the sheets as they pass through said piling mechanism for controlling the operation of said pump, said switch including an operating lever pivotally mounted on one of said guides and having one end extending into the path of travel of the sheets as they pass between said guides, a contact carried by the other end of said lever, and a counter-weight carried by the contact end of said lever.

In testimony whereof, we have hereunto set our hands.

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