July 26, 1932. L. L. BEACH ET AL 1,868,560

SHEET HANDLING APPARATUS

Filed Dec. 23, 1929 2 Sheets-Sheet 1

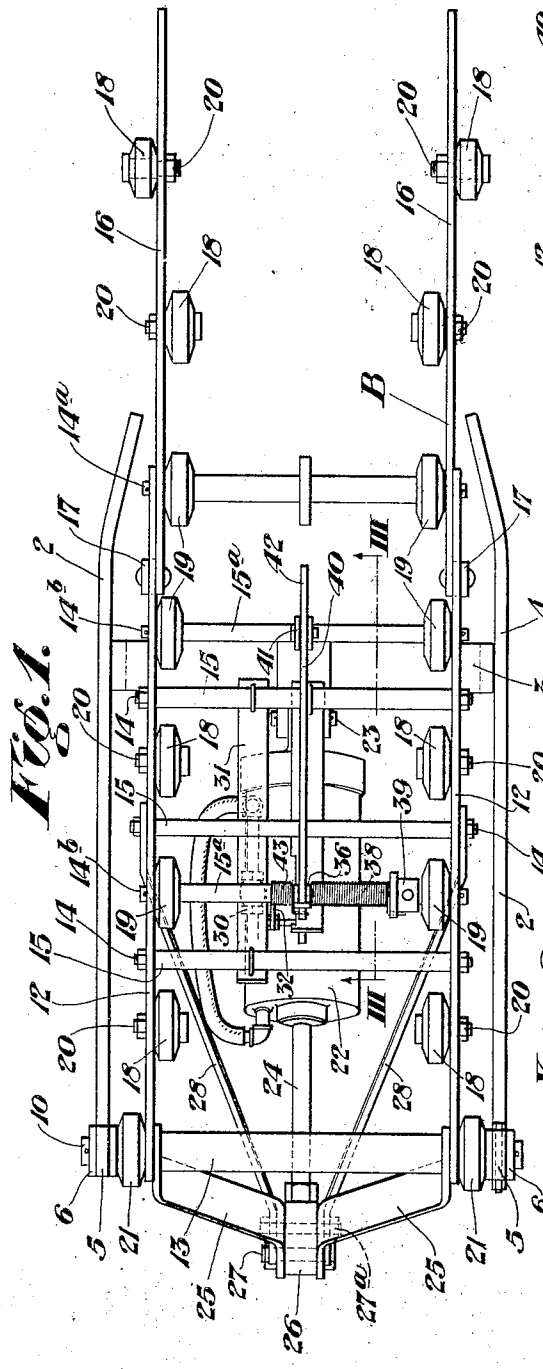


Fig. 1.

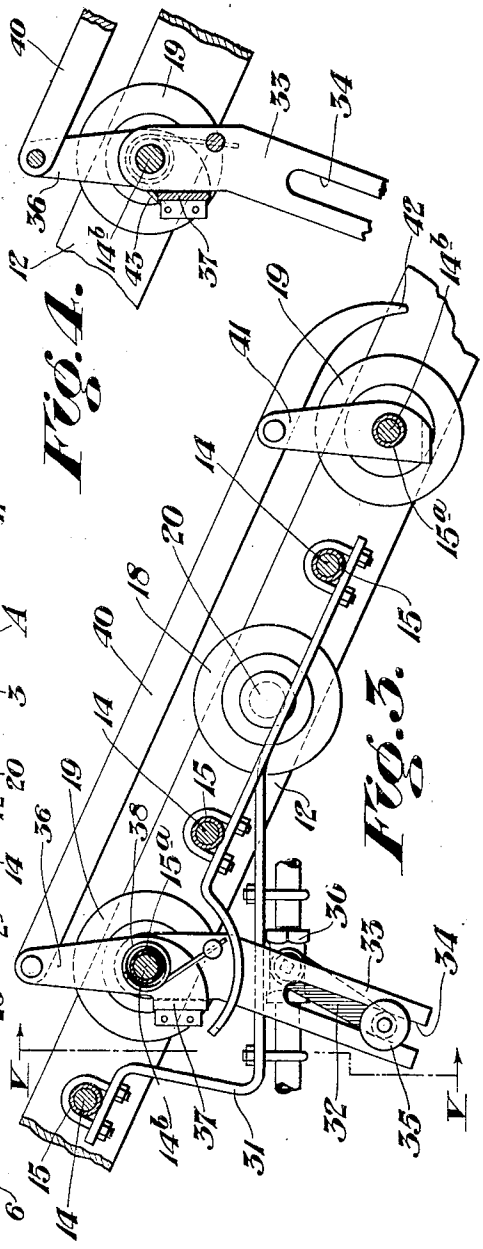


Fig. 3.

Fig. 4.

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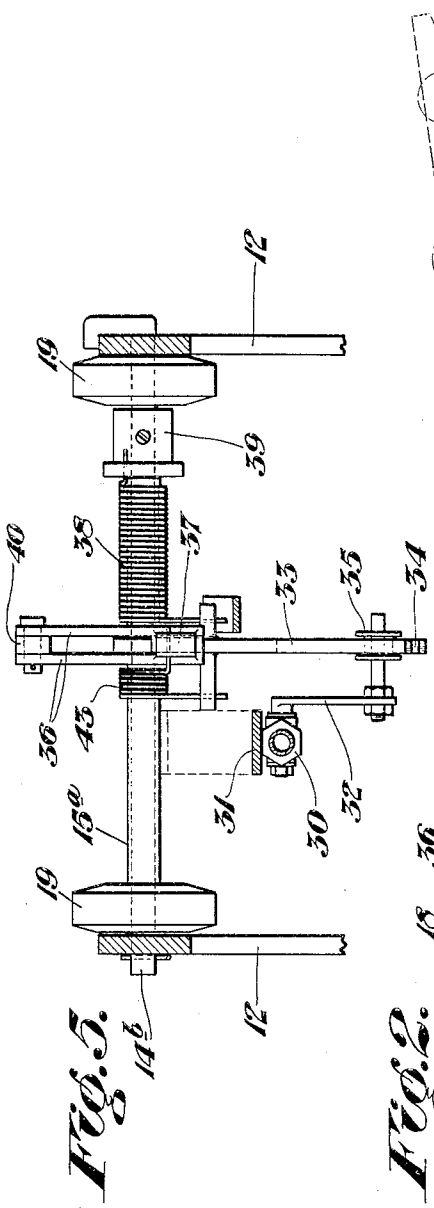


Fig. 1.

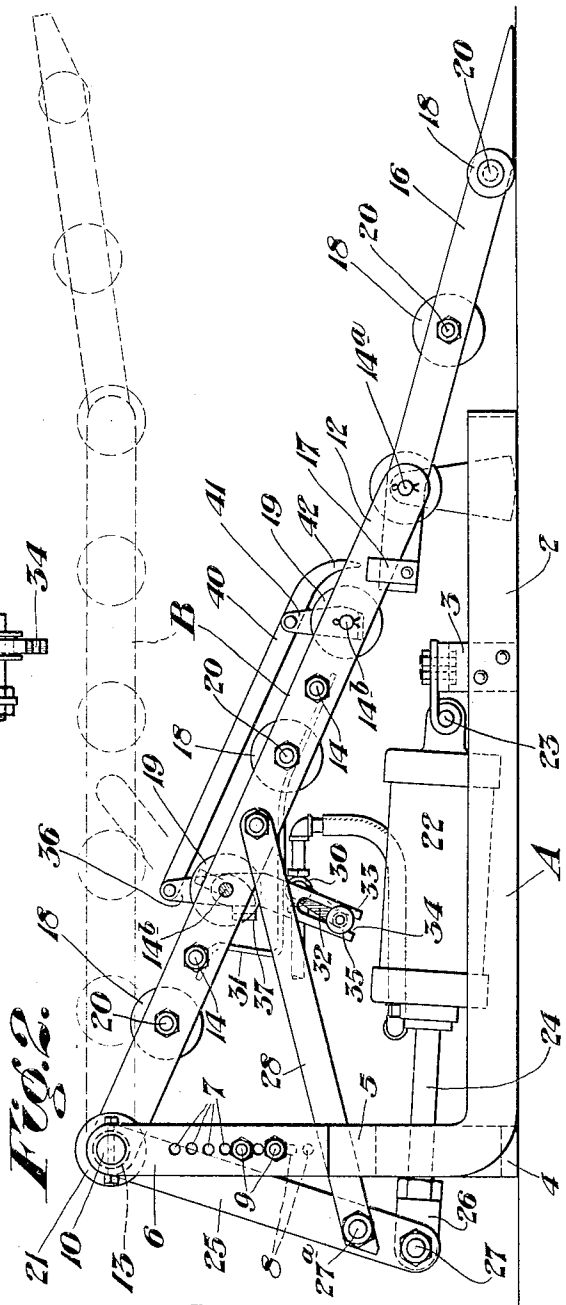


Fig. 2.

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1,868,560

UNITED STATES PATENT OFFICE

LETCHER L. BEACH AND CARL GUSTAVE WRIGHT, OF CAMBRIDGE, OHIO, ASSIGNORS TO AMERICAN SHEET AND TIN PLATE COMPANY, A CORPORATION OF NEW JERSEY

SHEET HANDLING APPARATUS

Application filed December 23, 1929. Serial No. 416,116.

This invention relates to sheet handling apparatus and more particularly to a conveying and lifting apparatus for sheets and packs of sheets and has for its object the provision of an apparatus for elevating sheets and packs of sheets from the floor level of a mill up into line with the bite of the rolls of a rolling mill, onto a level with the door of a furnace, or onto a level with any other elevated mechanism.

In the manufacture of sheets it is necessary in many cases to lift the sheets or packs of sheets from the mill floor and heretofore this lifting has been done manually.

The present invention provides a roller table over which the sheets or packs of sheets may be readily moved and provides means operable by the sheets or packs of sheets as they move over said table for elevating the table to raise the sheets to the desired level thereby eliminating the manual lifting and speeding up the operation of the mill.

In the drawings:

Figure 1 is a plan of a machine constructed in accordance with this invention.

Figure 2 is a side elevation thereof.

Figure 3 is a fragmentary sectional view taken on the line III—III of Figure 1.

Figure 4 is a fragmentary detail taken through the center of the valve operating lever.

Figure 5 is a sectional elevation taken on the line V—V of Figure 3.

Referring more particularly to the drawings, the letter A designates the frame as a whole which is composed of a pair of parallel L-shaped side members 2 which are held in fixed spaced relation by transverse members 3 and 4. The upstanding legs 5 of the members 2 are provided with adjustable extensions 6 which are provided with a series of holes 7 adapted to register with a series of holes 8 in the legs 5, so as to provide for vertical adjustment of the extensions 6 by passing bolts 9 through selected ones of the registered holes 7 and 8.

A transverse rod 10 extends between and is secured in the upper ends of the leg extensions 6 and serves as a support for a hinged or pivoted table B. The table B comprises side members 12 which are pivotally mounted at their rear ends on the rod 10 and held in spaced relation on said rod by a sleeve 13. A plurality of tie rods 14 are arranged at spaced intervals along the length of the side members 12 and carry spacer sleeves 15 for holding the side members in assembled spaced relation.

Short skid arms 16 are pivotally mounted on a shaft 14^a at the forward end of the table side members 12 and form extensions of the side members 12. The rear ends of the arms 16 extend beyond the shaft 14^a to which they are pivoted and are provided with outwardly projected stop members 17 adapted to engage the lower faces of the side members 12 when the table is elevated to hold said skid arms in line with said side members.

A plurality of conveyer roller-disks 18 and 19 are mounted on the table B. The disks 18 are mounted on stub shafts 20 while the disks 19 are mounted on the shaft 14^a and other shafts 14^b. A pair of disks 21 are mounted on the rod 10.

A fluid pressure cylinder 22 is hingedly mounted at 23 to the transverse frame member 3 and has its piston rod 24 extending rearwardly and pivotally connected to the lower end of a pair of arms 25 which are pivotally mounted on the rod 10 and have their lower ends joined together by a spacer-block 26 and bolt 27.

Connecting arms 28 have their forward ends connected to the opposite side members 12 of the table B and have their rear ends mounted on the bolt 27^a.

In operation, when the cylinder 22 is operated to retract the piston rod 24 the arms 25 will be rocked forwardly so as to cause the connecting arms 28 to move forwardly and upwardly and thereby lift the table B upwardly about its pivotal mounting on the rod 10.

In order to control the operation of the cylinder 22, a three-way control valve 30 is supported on a bracket 31 suspended from two spaced ones of the rods 14. The valve 30 is provided with an operating lever 32 adapted to be swung in a direction parallel with the longitudinal axis of the table.

A lever 33 is pivotally mounted on the spacer-sleeve 15ᵉ of the shaft 14ᵇ immediately above the valve 30 and has its lower end slotted at 34 and fitted over a spool 35 rotatably mounted on the valve operating lever 32. A second lever 36 is pivotally mounted on the sleeve 15ᵃ adjacent the lever 33 and has a lug 37 which overlies the rear edge of the lever 33. When the lever 36 is rocked rearwardly the lug 37 engages the lever 33 and rocks it forwardly so as to operate the valve 30 and admit fluid to the cylinder 22 and thereby operate said cylinder to raise the table B.

A coiled spring 38 is mounted over the sleeve 15ᵃ, on which the levers 33 and 36 are pivoted, and has one end connected to a collar 39 removably locked on said sleeve and its other end secured to the lever 33 so that the spring will return the levers 33 and 36 and valve lever 32 to normal or closed valve position when the lever 36 is released.

A trigger-bar 40 has its rear end pivotally connected to the upper end of the lever 36 and is supported adjacent its forward end by a link 41 having its lower end pivotally mounted on one of the rods 14 and having its upper end pivotally connected to the trigger-bar 40. The forward end of the trigger-bar 40 is curved downward below the top of the roller-disks 18 and 19, as at 42, so as to provide a skid surface over which the sheets and packs of sheets being moved over the table will pass.

A second coiled spring 43 is mounted around the sleeve 15ᵃ on which the levers 33 and 36 are pivoted and is connected to the lever 36 so as to be tensioned when said lever is rocked forwardly by sheets being moved forwardly on the table and being adapted to automatically return the lever 36 and trigger-bar 40 to normal position when the sheets have passed forwardly over the trigger-bar.

In operation, the apparatus of this invenvention will be placed in position adjacent the furnace, mill or other device into which it is desired to feed the sheets or packs of sheets. The operator will then slide the sheets onto and along the table B so that they engage the trigger-bar 40 and thus operate the valve 30 to admit fluid to the cylinder 22 which will then operate to raise the table B on a level with the entrance of the furnace or other device receiving the sheets. The operator will continue to move the sheets along the table B as the table is being raised and thus feed the sheets into or onto the device receiving the sheets without lifting. As the sheets move from over the trigger-bar 40 the trigger-bar 40 and assembled mechanism will be returned to normal position by means of the coiled spring 38.

While the table B is shown with idler conveyer rollers 18 and 19, it will be understood that these rollers may be driven rollers if desired.

It will also be understood that while we have shown the apparatus of this invention as a portable apparatus capable of being bodily moved from place to place in a mill by the aid of a crane, we do not wish to be limited to such construction since various modifications may be made without departing from the scope of our invention, as defined in the appended claims.

We claim:

1. A portable sheet lifter and conveying mechanism for sheets and packs comprising an L-shaped frame, said frame having its vertical leg adjustable vertically, a normally inclined roller table having one end pivotally mounted on the upper end of said vertical leg and its other end free and adapted to rest on the mill floor, a fluid pressure cylinder pivotally mounted on said frame, means operatively connecting the piston of said cylinder and said table whereby operation of said cylinder will rock said table about its pivotal mounting on said frame so as to raise said table to a position horizontal with said mounting, a valve mounted on said table for controlling the flow of fluid to said cylinder, means operable by the sheets passing along said table for operating said valve to admit fluid to said cylinder and spring means for returning said operating mechanism to normal position to close said valve.

2. A portable sheet lifter and conveying mechanism for sheets and packs comprising an L-shaped frame, said frame having its vertical leg adjustable vertically, means for locking said leg in selected adjusted positions, a roller table pivotally mounted at one end to said vertical leg of said frame and adapted to be raised to a position substantially horizontal with said pivotal mounting and to be lowered to an inclined position so that its free end rests on the floor, and power means for raising and lowering said roller table.

3. A portable sheet lifter and conveying mechanism for sheets and packs comprising an L-shaped frame, said frame having its vertical leg adjustable vertically, means for locking said leg in selected adjusted positions, a roller table pivotally mounted at one end to said vertical leg of said frame and adapted to be raised to a position substantially horizontal with said pivotal mounting and to be lowered to an inclined position so that its free end rests on the floor, a fluid pressure cylinder connected to and adapted to raise and lower said table, a valve for controlling the flow of fluid under pressure to said cylinder, and means operable by the sheets passing over said table for operating said valve.

4. A portable sheet lifter and conveying mechanism for sheets and packs comprising an L-shaped frame, said frame having its vertical leg adjustable vertically, a normally

inclined roller table having one end pivotally mounted on the upper end of said vertical leg and its other end free and adapted to rest on the mill floor, a fluid pressure cylinder pivotally mounted on said frame, means operatively connecting the piston of said cylinder and said table whereby operation of said cylinder will rock said table about its pivotal mounting on said frame so as to raise said table to a position horizontal with said mounting, and a valve for controlling the flow of fluid to said cylinder.

In testimony whereof, we have hereunto set our hands.

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