Dec. 4, 1945. F. J. LE ROY 2,390,261

CONVEYER

Filed Sept. 11, 1943 2 Sheets-Sheet 1

Fig. 2

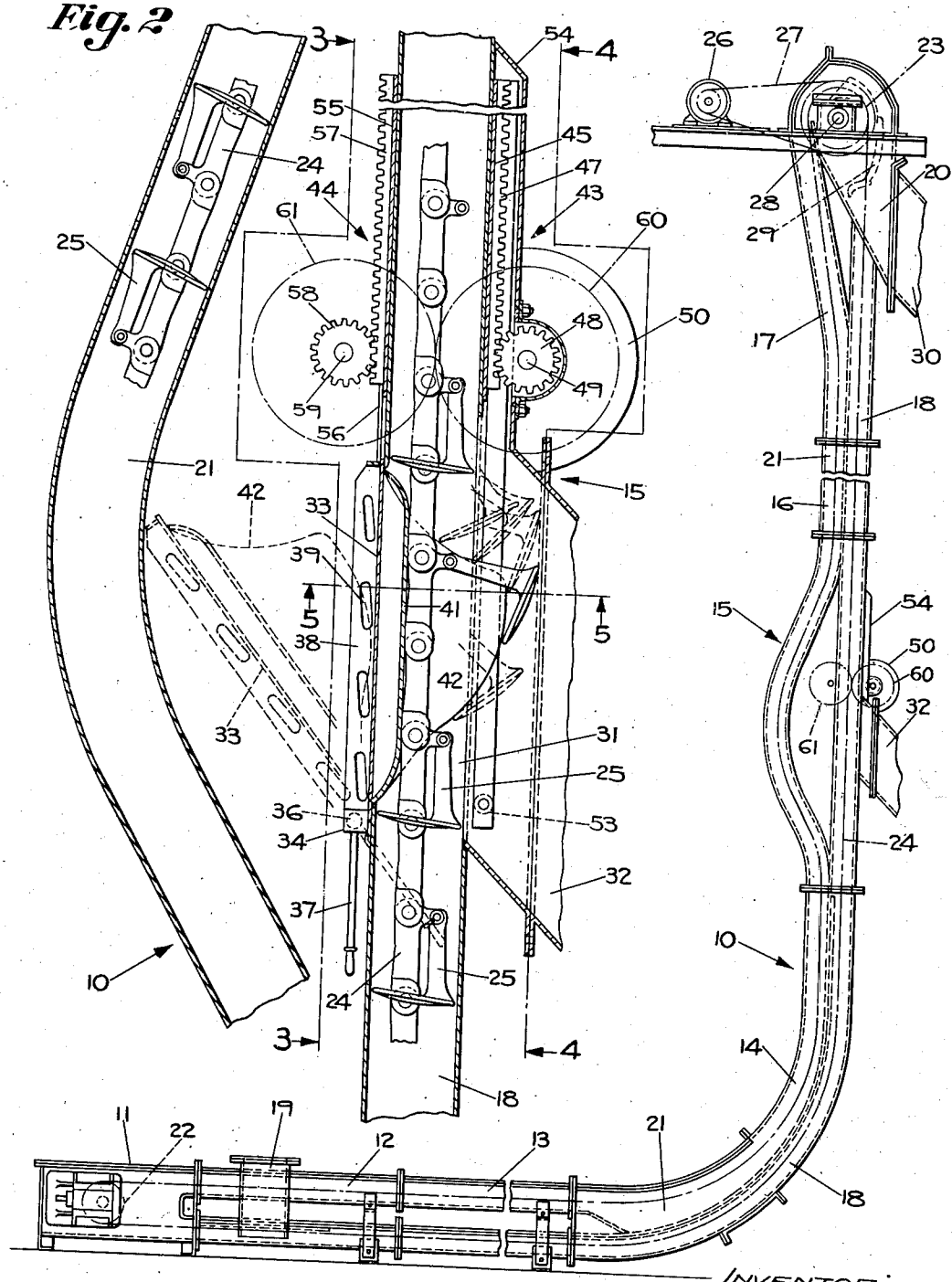


Fig. 1

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Dec. 4, 1945. F. J. LE ROY 2,390,261

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Filed Sept. 11, 1943 2 Sheets-Sheet 2

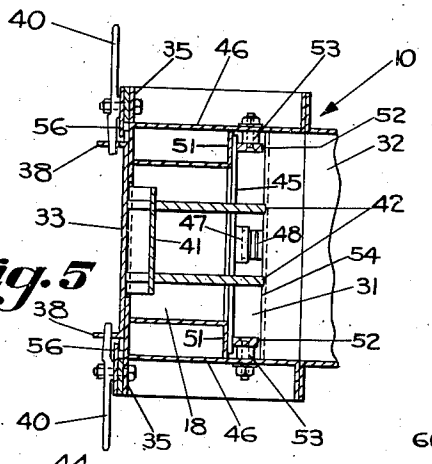


Fig. 5

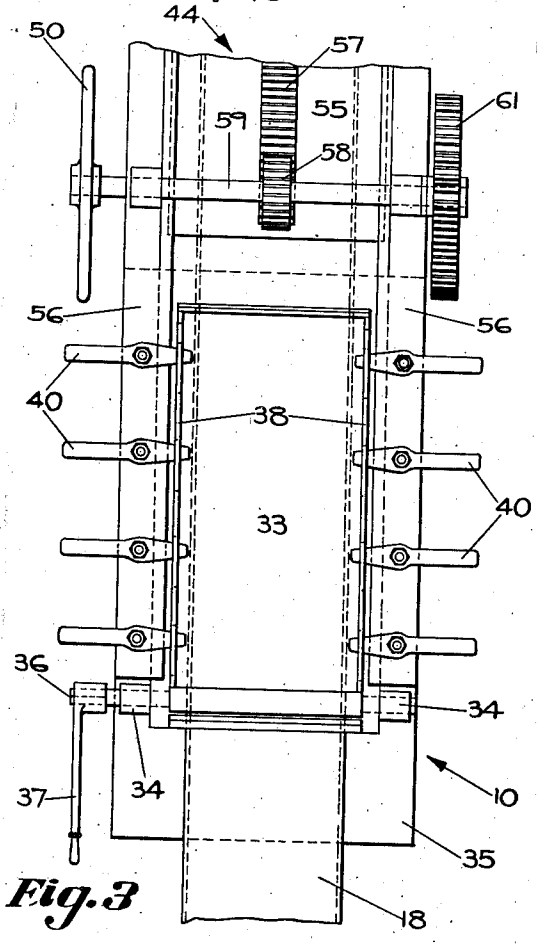


Fig. 3

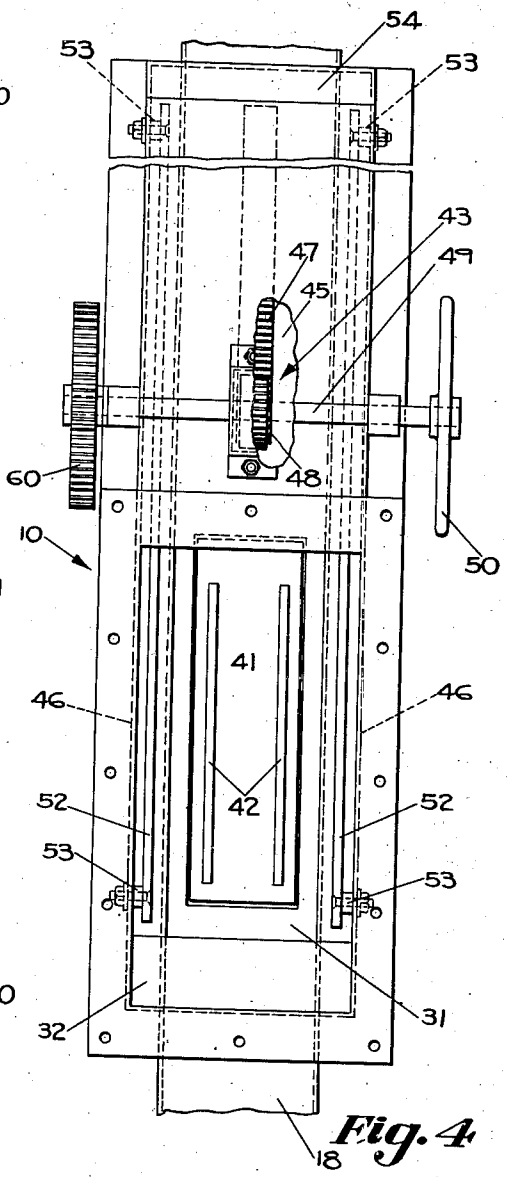


Fig. 4

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UNITED STATES PATENT OFFICE

2,390,261

CONVEYER

Franklin J. Le Roy, Columbus, Ohio, assignor to The Jeffrey Manufacturing Company, a corporation of Ohio

Application September 11, 1943, Serial No. 502,006

8 Claims. (Cl. 198—169)

This invention relates to a conveyer and particularly to an elevating type of conveyer having a casing forming enclosing working and return legs.

An object of the invention is to provide a conveyer of the above-mentioned type in which material which is being elevated in upward direction may be discharged, if desired, at an intermediate position between the feed position and the normal discharge position in the head section.

Another object of the invention is to provide improved mechanism controlling selectively the discharging or non-discharging of material at an intermediate station in an elevating conveyer.

A further object of the invention is to provide an improved intermediate section for a conveyer particularly adapted to provide for the discharge of material, if desired, or to provide for the continuous conveying of the material therethrough to the head section where it is normally discharged.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claims.

In the accompanying drawings,

Fig. 1 is a side elevational view of a conveyer or elevator incorporating the features of my invention;

Fig. 2 is an enlarged sectional view showing a portion of the intermediate section which constitutes a feature of my invention;

Fig. 3 is a rear view taken on the line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a front view taken on the line 4—4 of Fig. 2, looking in the direction of the arrows; and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2, looking upwardly or in the direction of the arrows.

The conveyer or elevator of my invention is shown as generally L-shaped, though it is to be understood that various other shapes of conveyer may be employed. Said conveyer includes a casing or housing 10 which is made up of a plurality of interconnected sections including foot or tail section 11, feed section 12, one or more horizontal sections 13, curved section 14, intermediate discharge or special section 15, one or more upright or vertical sections 16, and a head or discharge section 17. Each of the above-mentioned sections is of normal construction and preferably follows the structure of similar sections in the application of Stanley M. Mercier, Serial No. 448,395, filed June 25, 1942, entitled Conveyer, except for the intermediate discharge or special section 15 which is novel in this device.

The interconnected sections 11 to 17, inclusive, form a substantially totally enclosing housing and provide a substantially totally enclosing working leg 18 which extends from a feed chute 19 associated with the feed section 12 to a discharge chamber 20 formed in the head section 17. This working leg is generally rectangular in shape and thus is provided with four walls. Also extending from the feed section 12 to the head section 17 is a return leg 21 which is substantially totally enclosing and is also formed of generally rectangular shape provided with four walls.

Throughout a number of the sections or portions of them, the working leg 18 and the return leg 21 have a common partition. For example, throughout section 16 these two legs have such a common partition. Furthermore, at the top and the bottom, or, in other words, at the two ends, of the intermediate discharge section 15 there is a common partition for the portions of the working leg 18 and return leg 21 provided by this special section, but intermediate these two ends said leg portions are spaced-apart and thus have entirely independent walls. As clearly illustrated in Figs. 1 and 2 of the drawings, the return leg portion provided by the section 15, is curved outwardly between its two ends. This provides for apparatus hereinafter described more completely.

Traveling through the working leg 18 and return leg 21 and between a foot sprocket 22 in foot section 11 and a driving head sprocket 23 in head section 17, is a conveying mechanism in the form of an endless draft chain 24 which is provided with pivoted trailing flights 25 which are disclosed in the above mentioned Mercier application as well as in the patent to A. F. White, No. 2,170,934, dated August 29, 1939. It may be stated that the flights 25 as here illustrated are substantially of the so-called solid type but, if desired, skeleton type flights may be employed.

To drive the draft chain 24 there is provided an electric motor 26 which is connected by a chain and sprocket drive mechanism 27 to drive a head shaft 28 on which the head sprocket 23 is mounted. It may also be pointed out that the head section 17 includes cam means 29 which tilt the pivoted flights 25 as they travel through the discharge chamber 20 and thus discharge material onto a sloping plate forming a bottom of said discharge chamber 20 over which material will flow by gravity through a discharge chute 30.

Attention is now directed to the particular

structure of the intermediate discharge or special section 15. Said special section 15 includes portions of the working leg 18 and the return leg 21 which have a common dividing wall or partition at their opposite ends or, in other words, at their tops and bottoms as illustrated in Fig. 1 of the drawings. Between these ends, however, the two legs have entirely independent walls, and the return leg is curved outwardly to provide an appreciable amount of space between them.

The front wall of the working leg 18 is provided with a discharge opening 31 which leads to a discharge chute 32. Opposite the opening 31 and on the back wall of the working leg 18 is a pivoted door 33 which when in the full line position illustrated in Fig. 2 of the drawings, closes an opening in said back wall. The door 33 is pivotally attached to spaced brackets 34 formed on a back plate 35 which is built in the form of a pair of wings constituting lateral extensions of the back wall of said working leg 18. Said wings may, for example, be welded along the edges of the leg 18 parallel with said back wall.

A pivotal connection for the door 33 is provided by a shaft 36 which is pivoted in journals provided by brackets 34 and which is rigidly attached to the door 33. An operating handle 37 is provided to swing the shaft 36 and thus to swing the door 33 either to the full line position illustrated in Fig. 2 of the drawings or to the dotted line position illustrated therein.

The door 33 is provided on its sides and at its rear with a pair of reinforcing plates 38 which are provided with elongated sloping slots 39 adapted to receive pivoted latches 40. On its inside the door 33 is provided with a chain supporting and guiding plate 41, the top and bottom edges of which are curved into contact with the door 33 and are rigidly attached thereto as by welding. Also mounted on the door 33 and extending inwardly and thus into the working leg 18, is a pair of spaced cams 42, said cams being welded to the door 33 and extending through slots in the plate 41 to which they are also preferably welded.

As clearly illustrated in Fig. 2 of the drawings, the cams 42 are adapted to tilt the pivoted flights 25 to a discharging position as the chain 24 travels upwardly through the working leg 18 to convey material therethrough from the feed chute 19 and when the parts are in the positions illustrated in Fig. 2 of the drawings, the material being conveyed will be discharged by the intermediate discharge or special section 15 and thus be delivered from the elevator or conveyer by way of chute 32.

The structure of the intermediate discharge section 15 is such that the cams 42 may be removed from the working leg 18 and the discharge opening 31 as well as the opening which is normally closed by door 33 closed so that the material will travel through the working leg 18 within section 15 and be discharged by way of the discharge chamber 20 and discharge chute 30 in the head section 17. In other words, material may or may not be discharged by the special section 15, at the option of the operator. It is particularly for this reason that the door 33 is adjustable by virtue of its pivotal connection above described and movable to the dotted line position illustrated in Fig. 2, in which the cams 42 are moved completely from the working leg 18.

To provide for the closure of the opening normally closed by the door 33 and the discharge opening 31, there is provided a pair of adjustable gates designated generally by the reference characters 43 and 44. The gate 43 includes a vertically slidable plate 45 which, as clearly illustrated in Fig. 5 of the drawings, has a lateral extension beyond the vertical side walls of the working leg 18 and is within the confines of an enclosing box-like extension housing formed by a pair of side plates 46 which are rigidly attached as by welding to the back plate 35 and which cooperate with the chute 32 to provide a discharge chamber which has a width appreciably greater than the width of the working leg 18, as clearly illustrated in Figs. 4 and 5 of the drawings.

Vertical sliding movement of the plate 45 is provided by a rack 47 which is rigidly attached to the plate 45 and which meshes with a pinion 48 carried on a shaft 49 journaled in appropriate bearings on side flanges provided on the fronts of side plates, which shaft 49 is operated by a hand wheel 50. The plate 45 of the gate 43 is guided laterally by the aforementioned side plates 46. At its back it bears upon the front wall of the working leg 18 and lateral extensions thereof which are seen at 51 in Fig. 5 of the drawings.

To hold the plate 45 against the lateral extensions 51 and against the forward wall of the working leg 18, there is provided a guide rail 52 adjacent each side edge thereof, said rails 52 being supported by top and bottom brackets 53 from the aforedescribed side plates 46. It is evident that by operating the hand wheel 50, the slide plate 45 may be vertically adjusted either to close the discharge opening 31 or to open it completely. It is, of course, evident that in order to close said opening by lowering the plate 45, the door 33 must be swung rearwardly to its dotted line position shown in Fig. 2 of the drawings so as to remove the cams 42 from the working leg 18.

It may be pointed out further that the plate 45, rack 47 and the pinion 48 are preferably enclosed by virtue of a housing 54 which is mounted on the front wall of the working leg 18.

The gate 44 includes a vertically adjustable plate 55 which is mounted adjacent the rear face of the rear wall of the working leg 18 and has its side edges guided by a pair of vertical guide plates 56 (see Figs. 3 and 5), which are spaced from the aforedescribed back plate 35 so that the plate 55 is held in proper position while being vertically adjusted. Said plate 55 is provided with a rack 57 which is driven by a pinion 58 mounted on a shaft 59 journaled in appropriate bearings carried by the guide plates 56.

To provide for operation of the shaft 59, it is geared to the aforementioned shaft 49 by virtue of a pair of large gears 60 and 61, the former being rigidly attached to the shaft 49 and the latter to shaft 59. As a consequence of this particular structure it is evident that operation of the handle 50 will simultaneously raise or lower the gates 43 and 44 by adjusting the slide plates 45 and 55 together. It is further evident that to close these gates 43 and 44 it is necessary to adjust or swing the door 33 to the dotted line position, whereupon when the gates are operated the two opposed openings in the front and rear walls of the working leg portion 18 will be closed and the conveyer chain 24 and flights 25 will travel through said working leg portion 18 in substantially the same manner and with substantially the same result as when traveling through a section, such as section 16.

The curved return leg portion 21, of course, provides room for swinging of the door 33 to the

dotted line position and guides the chain **24** and flights **25** around said door when it is so adjusted.

The operation of the device is believed to be quite clear from the above description, and briefly is as follows. Any granular material to be fed will be delivered to the feed chute **19** and by it preferably directed into the working leg **18** at the feed section **12**. The material will be conveyed through the working leg **18** by the travel of the chain **24** and flights **25** and if the intermediate discharge or special section **15** is adjusted to the full line position illustrated in Fig. 2 of the drawings, the material will be discharged by this section to the chute **32**. If, however, it is desirable to discharge the material to the chute **30**, the latches **40** will be adjusted to free the door **33** and it will be swung to the dotted line position illustrated in Fig. 2 of the drawings, and the gates **43** and **44** will be closed as above described. Under these conditions, the special section **15** will act substantially like an upright section **16** and the material will be conveyed through it and then discharged by discharge chute **30** in the head section **17**.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of the invention as defined by the claims hereto appended, and I therefore wish not to be restricted to the precise construction herein disclosed.

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

1. A casing section including walls providing an enclosing working leg, a discharge opening in a wall of said casing, a door on an opposite wall of said casing closing an opening in another casing wall, a cam on said door extending into said leg, means providing for adjustment of said door to remove said cam from said leg, and means for closing said two wall openings.

2. A casing section including four enclosing walls forming a working leg, a discharge opening in one wall, a second opening in another wall, a pivoted door normally closing said second opening, a cam on said door normally extending into said leg, means for adjusting said door to remove said cam from said leg, and interconnected rack and pinion operated gates for simultaneously closing said openings.

3. A casing section including four enclosing walls forming a working leg, a discharge opening in one wall, a second opening in another wall, a door normally closing said second opening, a cam on said door normally extending into said leg, means for adjusting said door to remove said cam from said leg, and interconnected rack and pinion operated gates for simultaneously closing said openings.

4. A casing section including four enclosing walls forming a working leg, a discharge opening in one wall, a second opening in another wall, a door normally closing said second opening, a cam on said door normally extending into said leg, means for adjusting said door to remove said cam from said leg, and rack and pinion operated gates for closing said openings.

5. A conveyer casing section forming a substantially totally enclosing working leg on opposite sides of a discharge opening in one wall thereof and adapted to confine material scraped therethrough, a second opening in said leg opposite said first named opening, a gate for each opening, and interlocked mechanism for simultaneously opening and closing each gate.

6. A conveyer casing having feed, head and intermediate sections connected together and forming enclosing working and return legs, said intermediate section having a common dividing partition wall between the two legs at each end and having entirely independent walls for the two legs for a portion between its ends, one of said legs being curved outwardly between its two ends, and a door on one of said legs swingable toward the curved portion of the other.

7. A conveyer casing having feed, head and intermediate sections connected together and forming enclosing working and return legs, said intermediate section having a common dividing partition wall between the two legs at one end and having entirely independent walls for the two legs for a portion between its ends, one of said legs being curved outwardly between its two ends, and a door on one of said legs swingable toward the curved portion of the other.

8. A casing section including an enclosing leg, a pivoted door for an opening therein, and a flight tilting cam on said door and within said leg when said door is closed.

FRANKLIN J. LE ROY.