

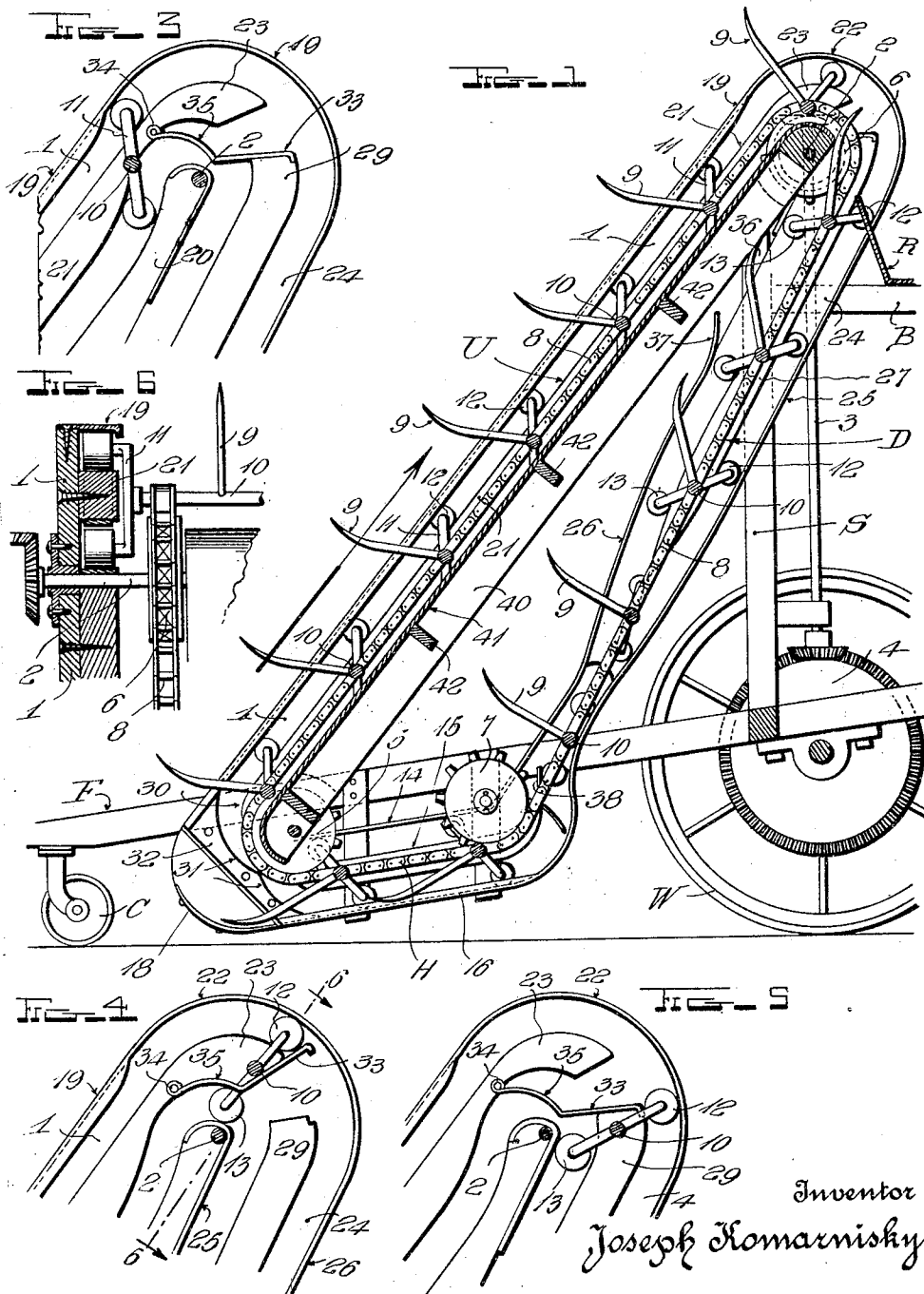
Sept. 2, 1924.

1,506,843

J. KOMARNISKY
ELEVATOR

Filed Jan. 28, 1924

2 Sheets-Sheet 1



Inventor

Joseph Komarnisky

By *A. Blumson & Co.*

Attorneys

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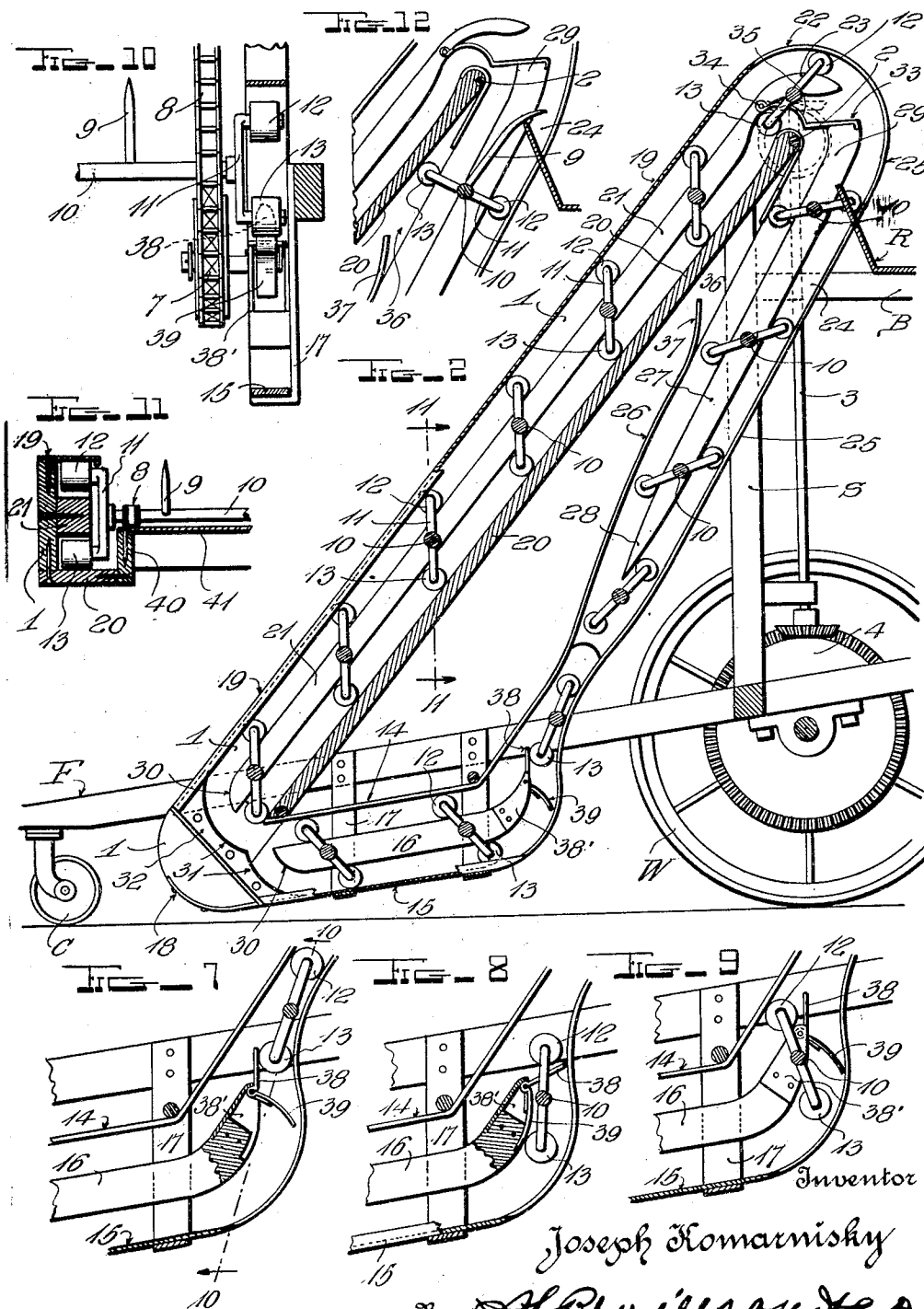
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UNITED STATES PATENT OFFICE.

JOSEPH KOMARNISKY, OF SCOBEY, MONTANA.

ELEVATOR.

Application filed January 28, 1924. Serial No. 689,072.

To all whom it may concern:

Be it known that I, JOSEPH KOMARNISKY, a citizen of the United States, residing at Scobey, in the county of Daniels and State of Montana, have invented certain new and useful Improvements in Elevators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to conveyors and more particularly to those used for elevating purposes, for instance, to elevate bundles of grain from the ground to a receiver for directing them to a traveling bundle-carrier or any other desired machine. The device includes an endless carrier having a plurality of pivoted forks or other elevating members, and it is the primary object of the invention to provide new and improved means for controlling the actions of these members, during their travel with the endless carrier.

With the foregoing in view, the invention resides in the novel subject matter herein-after described and claimed, the description being supplemented by the accompanying drawings.

Figure 1 is a substantially vertical longitudinal sectional view through a machine constructed in accordance with my invention.

Figure 2 is a view similar to Fig. 1 but cut in a plane beyond the plane in which Fig. 1 is taken.

Figures 3, 4 and 5 are detail vertical sectional views showing the manner in which the controlling shoes of the pivoted elevating members, are guided into proper relation with guiding tracks, as they descend.

Figure 6 is a vertical transverse sectional view as indicated by line 6—6 of Fig. 4.

Figures 7, 8 and 9 are detail vertical longitudinal sectional views illustrating the manner in which the shoes of the pivoted elevating members, are guided from certain vertical trackage, onto horizontal trackage which leads forwardly therefrom to the main trackage up which said shoes travel during the elevating operation.

Figure 10 is a vertical transverse sectional view as indicated by line 10—10 of Fig. 7.

Figure 11 is a transverse sectional view on line 11—11 of Fig. 2.

Figure 12 is a view similar to a portion of Fig. 2, but illustrating more particularly the position taken by each of the pivoted elevating members, when depositing its load upon the elevated receiver.

In illustrating my invention, I have shown it mounted upon a portable frame F having rear wheels W and front casters C. Standards S have been shown, rising from the rear end of the frame F and supporting the front ends of horizontal bars, one of which is indicated at B in Figs. 1 and 2, these bars being provided for the support of an elevated chute or other receiver R for directing bundles of grain, elevated by the improved elevator, to any desired traveling carrier or other machine.

In the construction shown, a pair of rearwardly inclined side boards 1 extend from the front portion of the frame F to the upper ends of the standards S, and an upper transverse shaft 2 extends between the upper ends of said side boards, said shaft being suitably driven from a vertical shaft 3 in turn driven by gearing 4 from one of the wheels W. At the lower ends of the side boards 1, guide sprockets 5 are suitably mounted in alinement with other sprockets 6 secured upon the shaft 2, and an endless carrier is trained around these sprockets, and additional sprockets 7 which are mounted behind said sprockets 5. In the construction shown, this carrier includes a pair of endless chains 8 which pivotally carry a plurality of forks or other elevating members 9, each of these members being shown as provided with a rock shaft 10 carried by the chains 8, the ends of said rock shaft being provided with cross arms 11 having controlling shoes 12 and 13 which are preferably in the form of rollers.

The endless carrier above described, is provided with a short horizontally movable reach H, an upwardly movable reach U and a downwardly moving reach D, and guiding trackage is provided for the shoes 12 and 13, so that the forks or the like 9 are directed forwardly, substantially toward the reach U as they travel horizontally with the reach H, so that said forks may pick up bundles or the like from the ground. Other trackage is provided to engage the shoes and hold the forks 9 in bundle-carrying position while they travel upwardly, additional trackage is provided down which the shoes travel with the reach D, to cause

the forks 9 to start their descent in a substantially upstanding position, and means are provided to engage the shoes and swing the forks 9 forwardly toward their horizontal positions, before starting them along the horizontal trackage.

In the construction shown, the trackage for the horizontal reach H, comprises an upper rail 14, a lower preferably channeled rail 15, and an intermediate rail 16, thus forming one track for the shoes 12, between the rails 14 and 16, and another track for the shoes 13 between the rails 15 and 16. All of these rails may well be secured to suitable hangers 17, carried by the frame F. The front end of each rail 15 is preferably turned upwardly and secured to the lower end of the adjacent side board 1, as indicated at 18.

The substantially vertical trackage for the upwardly moving reach U, in the construction herein disclosed, comprises an upper guide rail 19, a lower guide rail 20 and an intermediate rail 21, one set of these rails being secured to the inner side of each of the side boards 1. The shoes 12 travel between the rails 19 and 21 and the shoes 13 are received between the rails 20 and 21. The upper end of the rail 19 is shown turned rearwardly around the upper end of the side board 1 as indicated at 22, and the upper end of rail 21 is similarly curved as indicated at 23.

Trackage for guiding the shoes during their descent includes in the present disclosure, a forwardly declined plate 24 at each side of the machine, said plate having rails or flanges 25 and 26 at its opposite edges and an intermediate rail 27 between said flanges terminating at a point as indicated at 28, the point being at the lower end of the rail 27, while the upper end 29 of the latter is in spaced, end to end relation with the rearwardly turned end 23 of the rail 21. Below the point 28, the flanges or rails 25 and 26 assume a rather close relation with each other and constitute a common trackway for the shoes 12 and 13, whereas previously to reaching this common trackway, the shoes 13 traveled between the rails 26 and 27 and the shoes 12 were received between the rails 25 and 27. In the construction shown, the lower end of the rail 26 is joined to the rail 14 and the lower end of the rail 25 is joined to the rail 15.

The adjacent ends of the rails 16 and 21 are rounded as indicated at 30 and co-act with concave surfaces 31 on bars 32 secured vertically across the lower ends of the side boards 1 in guiding the rollers 12 and 13 as they cease moving horizontally and start to move vertically. When the upward travel of these rollers and associated parts is completed and they are to be engaged with the

trackage for guiding them downwardly, they are properly guided into engagement with this trackage by the means described below.

An upwardly swingable, normally lowered arm 33, is pivoted at 34 adjacent the upper end of the rail 21 and has its free end disposed in the space between the rail ends 23 and 29. This arm is provided with a curved portion 35 at the end of the upward path of the roller 13 and when any of these rollers 13 comes in contact with said portion 35, the actions detailed in Figs. 3, 4, and 5, take place, that is, the roller 13 swings the arm 35 upwardly so that its free end constitutes an abutment to arrest movement of the roller 12 until said roller 13 is in proper position to engage with the track which guides it downwardly. Then, the arm 33 is released by said roller 13, as shown in Fig. 5, and the roller 12 can descend in its proper track. By this arrangement of abutment and operating means therefor, it will be seen that the movement of the forks or the like 9 as they start downwardly, is properly controlled, so that they may deposit their load into the receiver R. This depositing is preferably facilitated by cutting out a portion of the rail 26, as indicated at 36. Thus, the weight of any of the material clinging to the forks as they start downwardly, will tilt said forks rearwardly when the rollers 13 come opposite the cut-out 36, as seen in Fig. 12, and thus, the fork or the like 9 may substantially scrape upon the edge of the receiver R so that all material will be effectively removed therefrom. To restore the parts to their proper positions, after the scraping operation, I provide means such as a cam 37 in the downward path of the roller 13, as shown most clearly in Figs. 1 and 2.

In addition to the shoe-controlled means for properly guiding the shoes 12 and 13 into engagement with the trackage down which they descend, I provide somewhat similar, shoe-controlled, switch means for insuring proper guiding of said shoes into engagement with the horizontal trackage. In the construction shown, a switch tongue 38 is pivoted to the metal-bound rear end 38' of the rail 16 and this tongue is normally in a position to engage any of the shoes 13 as shown in Figs. 2 and 7, so as to guide said shoe downwardly under the rail 16. I have shown an operating arm 39 connected with and extending from the tongue 38 across the downward path of the shoe 13, so that when said arm is struck by said shoe as shown in Fig. 8, the switch tongue 38 is swung to a position for guiding the adjacent shoe 12 over the rail 16, as will be clear by reference to Figs. 8 and 9. It is thus insured that the shoes 12 and 13 shall travel properly along the horizontal trackage.

In the preferred form of construction, the rails 20 above described, are rather wide as shown in detail in Fig. 11, and vertical flanges 40 rise therefrom, one of these flanges being illustrated. The flanges at opposite sides of the machine are connected by a metal sheet 41 which may be supported at intervals by transverse bars 42 so as to form an effective support for the material being elevated.

While it is believed that the operation of the machine will be readily understood from the foregoing, it may be summarized as follows:—In traveling forwardly, the forks 9 are held in about the position shown in Fig. 1 by engagement of their control shoes 12 and 13, with the trackage 14—15—16 and these forks are properly turned to load-supporting position, as they start to ascend, by the construction of trackage above described for that purpose. As the forks ascend, the shoes 12 and 13, cooperating with the rails 19, 20 and 21, maintain said forks in such position as to effectively elevate their loads, and as the forks turn rearwardly from the last mentioned rails, the pivoted arm 33 retards their shoes 12 until the shoes 13 are properly positioned to descend between the rails 26 and 27. Then, the shoes 12 are released and can descend between the rails 25 and 27. When the gap 36 is encountered by any of the rollers 13, the fork 9 associated with said roller may tilt rearwardly as shown in Fig. 12 to effectively deposit its load upon the receiver R, and when said shoe 13 engages the cam 37, the fork is again swung forwardly to some extent. When the shoes 12 and 13 leave the point 28 of the rail 27, said shoes mutually travel between the portions of the rails 25 and 26 below said point, and thus the forks 9 swing forwardly toward horizontal position. When any of the shoes 13 encounters the spring-raised switch tongue 38, it necessarily can travel only into the space between the rails 15 and 16 and the adjacent shoe 12 can then enter no other space except that between the rails 14 and 16, as the shoe 13 has then swung the switch tongue 38 to the position of Fig. 8.

As excellent results may be obtained from the details disclosed, such details may well be followed, but it is to be understood that the present disclosure is principally for illustrative purposes and that within the scope of the invention as claimed, numerous changes may be made.

I claim:

1. An elevator comprising an endless carrier having an upwardly moving reach, a downwardly moving reach and a horizontally moving reach between the lower ends of said upwardly and downwardly moving reaches, said carrier including a pivoted elevating member, and a pair of spaced controlling shoes therefor, substantially hori-

zontal tracks for said shoes to direct said elevating member substantially toward said upwardly moving reach as said member moves horizontally, whereby to permit it to pick up a load, trackage for said shoes when traveling upwardly adapted to hold said elevating member in load-carrying position, substantially vertical tracks for said shoes when traveling downwardly to start said elevating member on its descent in an up-standing load-discharging position, shoe-controlled means for holding one of said shoes against engagement with its respective vertical track until the other shoe is positioned to engage its track, common trackage for both shoes under said vertical tracks to turn said elevating member toward its horizontal load-receiving position, and shoe-controlled switch means for properly guiding said shoes from said common trackage into engagement with said horizontal tracks.

2. A conveyor comprising an endless carrier having oppositely moving reaches, said carrier including a pivoted conveying member having a pair of spaced control shoes, means for guiding said shoes when moving in one direction, individual tracks for guiding said shoes when moving in the other direction, a normally inactive abutment to prevent movement of one of said shoes along its respective track until the other shoe is positioned to properly engage the other track, and means for automatically moving said abutment to operative position.

3. A conveyor comprising an endless carrier having oppositely moving reaches, said carrier including a pivoted conveying member having a pair of spaced control shoes, means for guiding said shoes when moving in one direction, individual tracks for guiding said shoes when moving in the other direction, and means actuated by one of said shoes for arresting movement of the other shoe until said one shoe is properly positioned to move along its respective track.

4. A conveyor comprising an endless carrier having oppositely moving reaches, said carrier including a pivoted conveying member having a pair of spaced control shoes, means for guiding said shoes when moving in one direction, individual tracks for guiding said shoes when moving in the other direction, and a pivoted arm adapted to swing into the path of one of said shoes to prevent movement thereof along its respective track until the other shoe is positioned to travel along the other track, said arm having a portion in the path of said other shoe adapted to be struck by the latter to swing said arm to operative position.

5. An elevator comprising an endless carrier having upwardly and downwardly moving reaches, said carrier including a pivoted elevating member having a pair of

spaced control shoes; inner and outer parallel tracks for said shoes when traveling upwardly, additional inner and outer tracks for said shoes when traveling downwardly, the upper ends of the inner and outer tracks being in communication with each other respectively, and a normally lowered pivoted arm adapted to swing upwardly into the descending path of one of said shoes to check the latter until the other shoe is positioned to engage its respective track when descending, said arm having a portion in the upward path of said other shoe to be struck by the latter, whereby to raise said arm to operative position.

6. A structure as specified in claim 4; said shoe guiding means including a rail between the two shoe paths; said individual tracks including a rail between the two shoe paths terminating in spaced end to end relation with the first named rail; said arm being pivoted at one end adjacent the first named rail and having its free end extending into the space between the two rails.

7. A conveyor comprising an endless carrier having a pivoted conveying member provided with spaced control shoes, a pair of parallel tracks for said shoes respectively, including a rail between the shoe paths, common guiding means for both shoes lead-

ing to said tracks, a switch tongue pivoted on one end of said rail and normally positioned to guide one of said shoes into engagement with its respective track, and an operating arm extending from said tongue into the path of said one shoe to be operated by the latter and move said tongue to a position for guiding the other shoe into engagement with its respective track.

8. An elevator comprising an endless carrier having upwardly and downwardly moving reaches and including a pivoted elevating member having two spaced control shoes, guiding means for said shoes including trackage along which they descend with said elevating member directed upwardly, a receiver for the material elevated by said member, said receiver being disposed adjacent the upper end of said trackage, said trackage having a gap in its downward reach to release one of said shoes and permit substantially horizontal swinging of said elevating member toward said receiver to deposit its load thereon, and a cam at the end of said gap in the downward path of said one shoe for returning said shoe after depositing the load on said receiver.

In testimony whereof I have hereunto affixed my signature.

JOSEPH KOMARNISKY.