

S. JOHNSON.
ELEVATOR.

APPLICATION FILED OCT. 8, 1910.

Patented Nov. 21, 1911.

1,009,318.

4 SHEETS-SHEET 1.

Fig. 6.

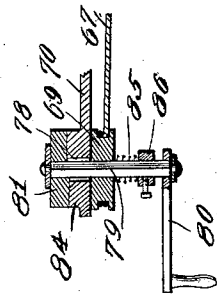
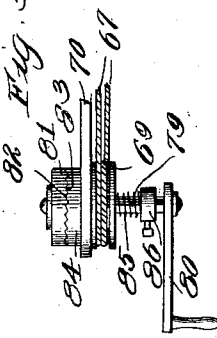
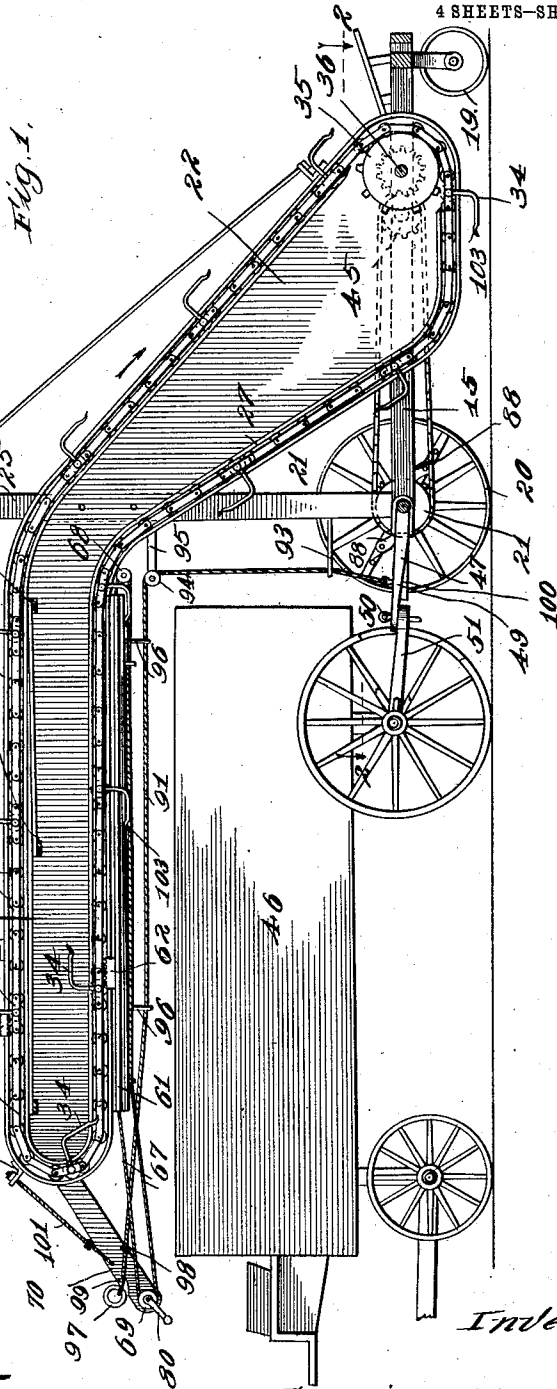


Fig. 5.



Witnesses:

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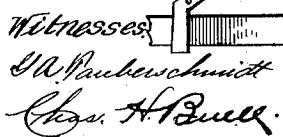
By Dyrenforth, Lee, Chittton & Niles.
Per W. H. Dyrenforth.

Attest.

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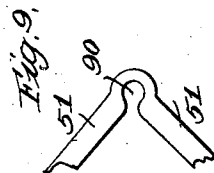
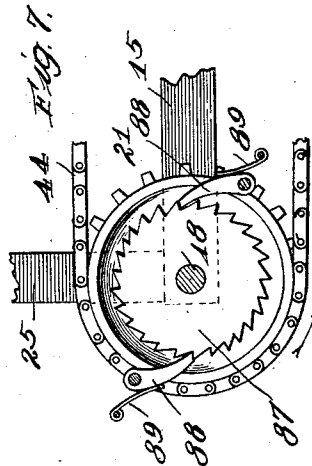
4 SHEETS—SHEET 2.



By

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Atty's



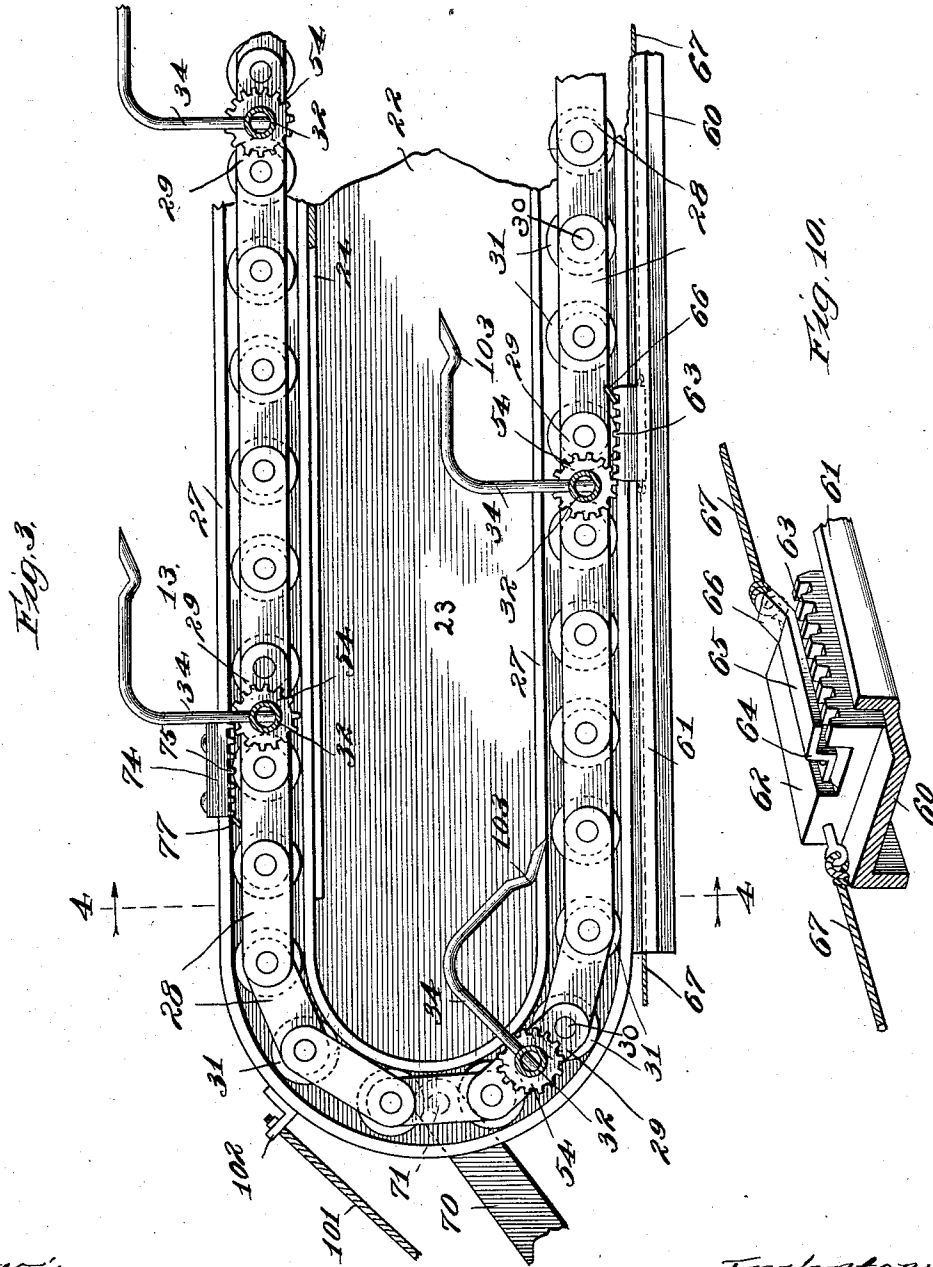
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4 SHEETS—SHEET 3.

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4 SHEETS--SHEET 4.



Sigfrid Johnson.

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UNITED STATES PATENT OFFICE.

SIGFRID JOHNSON, OF ST. CHARLES, ILLINOIS.

ELEVATOR.

1,009,318.

Specification of Letters Patent.

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Application filed October 8, 1910. Serial No. 585,962.

To all whom it may concern:

Be it known that I, SIGFRID JOHNSON, a subject of the King of Sweden, residing at St. Charles, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Elevators, of which the following is a specification.

My invention relates to improvements in elevators of the type employed in connection with wagons for gathering bundles, or shocks, of grain from the field and elevating them into the wagon to which the elevator is attached.

My objects, generally stated, are to provide improvements in elevators of this character, to the end of providing for the distribution of the bundles throughout the wagon, improving the means for controlling the tripping of the bundle-gathering fingers, and generally to so improve upon constructions of this character as hitherto provided as to render them better adapted to the use for which they are intended.

Referring to the accompanying drawings, Figure 1 is a view in side elevation of a wagon and an elevator connected therewith, the elevator being constructed in accordance with my invention and shown in longitudinal section. Fig. 2 is an enlarged sectional view taken at the line 2 on Fig. 1 and viewed in the direction of the arrow. Fig. 3 is an enlarged view in sectional elevation of the forward end-portion of the elevator-leg. Fig. 4 is an enlarged section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow. Fig. 5 is a plan view of the mechanism illustrated in Fig. 1 for adjusting the position of the hook-tripping mechanism. Fig. 6 is a plan sectional view of the mechanism illustrated in Fig. 5. Fig. 7 is a broken sectional view taken at the line 7 on Fig. 2 and viewed in the direction of the arrow. Fig. 8 is a broken view in side elevation of a part of the mechanism for driving the endless chains of the elevator. Fig. 9 is a broken enlarged plan view of one end of the bail attachment carried by the wagon at which the elevator is secured, for draft purposes. Fig. 10 is a perspective view of the adjustable trip-device for automatically tripping the bundle-engaging hooks, the guide for the tripping-device being shown in section and partly broken away. Fig. 11 is an enlarged section taken

at the line 11 on Fig. 4 and viewed in the direction of the arrow; and Fig. 12, an enlarged section taken at the line 12 on Fig. 11 and viewed in the direction of the arrow.

The elevator, generally stated, is formed of a rectangular frame composed of longitudinally-extending bars 15 connected together by cross-rods 16 and 17 and an axle 18, this frame being equipped at its rear end with a pair of relatively small wheels 19 and at its front end with a pair of wheels 20 journaled on the axle 18, sprockets 21 being journaled on this axle adjacent to the wheels 20. Secured to the frame of which the bars 15 form a part, is a pair of spaced side-frames 22 provided with forwardly-projecting horizontally-disposed extensions 23 at which the frames 22 are secured together as by brace rods 24. The frames 22 are braced between the bars 24 and their rear ends by uprights 25 secured to the bars 15 and engaging at their upper ends with brace rods 26 which are connected with the frames 22 near their opposite ends, the frame-work described serving to support an endless conveyer element equipped with bundle-engaging means, as hereinafter described.

The inner opposed sides of the frames 22 are provided about their marginal edges with channel-irons 27, the flanges of which afford pairs of tracks at the opposite side of the conveyer in which the conveyer-chains are located and guided, these chains, represented at 28, being preferably formed of overlapping links 29 connected together by shafts 30 equipped with rollers 31 which roll upon the flanges of the irons 27, as represented in Fig. 4.

At intervals throughout their length, the chains 28 are connected together by tubular rods 32, which are journaled in bosses 33 on opposed links of the chains, each rod carrying a plurality of hooks 34, spaced apart and rigidly connected therewith, these hooks being preferably secured at their ends in openings in the rods, as illustrated in Fig. 3. The inner flanges of the irons 27 are cut away at the rear end of the machine, as illustrated in Fig. 1, and at this point the chains 28, which are in effect sprocket-chains, pass over sprocket-wheels 35 fixed on the ends of the axle 36 within the confines of the frames 22, this axle carrying at its opposite ends beyond the frames collars

37 journaled thereon and adapted to be clutched to the axle 36 through the medium of longitudinal clutch-members 38 feathered on this axle and slidable longitudinally thereon, through the medium of yoke-levers 39 fulcrumed on lugs 40 secured to the outer faces of the frames 40 cooperating with notched stop-devices 41 for holding the levers 39 in the position to which they are adjusted for clutching or unclutching the gears 37 to the axle 36. The gears 37 mesh with gears 42 journaled on stub-shafts 43 secured to the bars 15 and adapted to be rotated for driving the chains 28 in the direction of the arrow in Fig. 1, by a sprocket-chain 44 extending over sprockets 45 on the stub-shafts 43 and the sprockets 21, whereby as the elevator is drawn over the field, the endless chains 28 and the hooks 34 carried thereby, when the gears 37 are clutched to the shaft 36, will travel in an endless path.

In practice, the elevator would be used in connection with a wagon, as for instance that illustrated at 46 in Fig. 1, and over practically the whole length of which the forward extensions or legs 23 of the conveyer extend, the elevator for this purpose having its front axle provided with draft-bars 47 and 48 journaled on the axle 18 and terminating at their forward ends in a tongue 49 adapted to be connected, as through the medium of the pin 50, with converging rearwardly-extending draft-bars 51 carried by the rear axle of the wagon. The elevator, as it is drawn along behind the wagon, engages at its hooks 34 with the bundles of grain (not shown) lying in the field and extending into the path of these hooks, lifting the bundles from the ground and carrying them to a point above the wagon into which they are discharged by the automatic disengagement of the hooks therefrom.

To accomplish the automatic discharge of the bundles from the conveyer, I provide tripping mechanism and resetting mechanism for the hooks, a description of which is as follows: Each rod 32 at one end contains diametrically opposed openings 52 and 53 which are located within the bosses 33. Each rod 32 carries a gear 54 rigidly connected therewith for rotating these rods in the bosses 33, in the manner hereinafter described. Each boss contains an opening 55 in which a plunger 56 is located, these plungers being adapted to be inwardly pressed through the medium of coil-springs 57 confined between the heads of the plungers and plugs 58 confined in the outer ends of the openings 55 and through which the stems 59 of the plungers extend. The openings 52 and 53 are so proportioned with respect to the heads of the plunger 56 that the latter may enter these openings under the action of the springs 57 when these

openings are moved into alinement with the openings 55 in the bosses. The arrangement of the parts described is such that as the hooks travel adjacent to the ground the openings 53 will be in registration with the openings 55 and the plungers 56 will engage with the rods 32 for holding the hooks in position with relation to the conveyer-chains 28, as illustrated of the lowermost hook in Fig. 1. One of the frames 22 extends below its lowermost channel-iron 27 and supports a Z-shaped bar 60 presenting an upwardly-turned flange 61, (see Fig. 4) this bar extending practically the full length of the forwardly-projecting leg of the elevator. Slidably confined between the frame 22 and the flange 61 is a block 62 equipped at an edge thereof with a horizontally-extending rack 63, and to one side of this rack with a Z-shaped member 64 spaced from the rack 63 and affording a horizontally-extending flange 65 having an upwardly-deflected section 66 extending a slight distance beyond the adjacent end of the rack 63, as clearly represented in Figs. 3 and 10. The block 62 connects at its opposite ends with the free ends of a cable 67, which passes over a pulley 68 secured to the frame 22 at the rear end of its horizontal portion, and a pulley 69 carried by a forwardly-projecting extension 70 pivoted to the frame 22, as indicated at 71, whereby adjustment of the block 62 at any point along the bar 60 may be effected by operating the pulley 69 in a manner hereinafter described. The rack 63 is provided for the purpose of cooperating with the gears 54 rotatable with the rods 32, whereby as the hook-devices 34 are brought to a position adjacent to this bar, the gears 54 engage with the rack 63 for turning the rods 32 in the bosses 33 for inverting the hooks to permit the bundles elevated thereby to drop into the wagon. Before the tripping of the hooks 34 can take place, the plungers 56 must be withdrawn from their engagement with the openings 53 in the rods, and this I accomplish through the medium of the cam-plates 66 which extend into the path of movement of rollers 72, (see Fig. 12) one of which is journaled on a pin 73 carried by the stem 59 of each plunger.

The relation of the parts just described is such that immediately preceding the engagement of a gear 54 with the rack 63, the plunger 56 cooperating therewith will be drawn downwardly against the action of the spring 57 to withdraw it from the opening 53 in the rod 32 and thus permit the gear 54 to roll upon the rack 63, the full movement of the gear 53 in operating against this rack turning the hooks 34 connected therewith to the position illustrated of the lowermost one in the right-hand side of Fig. 3. The plate 65 reaches short of the left-hand

end of the rack in Figs. 3, 10 and 11, and thus before the gear 54 coöperating therewith disengages with the rack 63, the plunger 56 is free to be forced under the action of the spring 57, thus causing the head of the plunger 56 to enter the opening 52 in the rod 32 for holding the hooks in the position of the one last referred to until the rods 32 and hooks 34 have been carried to a position in which they are traveling in the uppermost channel-bars 27, at which point they are caused to be returned to normal position for engaging with the bundles for the elevating purpose, through the medium of a stationary trip-device 74 which is a facsimile of the block 62 excepting that it is fixed on the uppermost one of the channel-irons 27 instead of being slidable upon the one beneath it. The device 74 is provided with a rack 75 and a plate 76 corresponding with the rack 63 and the plate 65 respectively of the block 62, whereby as the rods 32 are carried to a point adjacent to the device 74, the plungers, by engaging at their rollers 72 with the deflected cam-portion 77 of the plate 76, will operate to raise the plungers 56, withdrawing them from the openings 52 in the rods 32 immediately before the gears 54 mesh with the rack 75, thereby permitting the rack 75, by its engagement with the gears 54, to rotate the latter for turning the hooks to normal position. Before the gears 54 disengage with the rack 75 the rollers 72 of the plungers 56 disengage with the plate 76, as described of their action with relation to the block 62, and thus the plungers 56 are free to be projected, under the action of their springs 57, into the openings 53 in the rods 32 for locking these rods in a position in which the hooks 34 may hook into the bundles lying in the field when the hooks are moved through the lowermost portion of their path.

It will be noted from the foregoing, that by adjusting the block 62 along the bar 60, the point at which the rods 32 are turned for permitting the bundles to become disengaged from the hooks 34 may be varied as desired, thereby permitting the operator, by turning the pulley 69 in a manner herein-after referred to, to discharge the bundles at any points in the wagon, whereby manual handling of the same for their proper distribution throughout the wagon is avoided.

The pulley 69 is so connected with the member 70 as to permit it to be rotated in either direction for shifting the bar 62 to the right or left in Fig. 1 as desired, and holding it in such adjusted position, and as a desirable means for accomplishing this, I provide the following described construction: Extending through an opening 78 in the member 70 is a shaft 79, square in cross-section, which carries at one end a crank-handle 80 for turning it, and at its opposite

end a disk 81 provided on its face with teeth 82 adapted to mesh with teeth 83 provided on the opposing face of a boss 84 secured to the extension 70. The shaft 79 carries the pulley 69 which is longitudinally slidable thereon and forms a stop for one end of a coiled spring 85 bearing at its opposite end against a collar 86 fixed on the shaft, whereby the teeth on the member 81 are releasably held in intermeshing engagement with the teeth on the boss 84. It will be observed that the construction is such that the shaft 79 may be rotated in either direction for setting the block 62 but the movement of the latter when engaged by the gears 54 is prevented by reason of the clutching of the member 81 to the boss 84. The sprockets 21 are preferably driven from the wheels 20 through the medium of pawl-and-ratchet mechanism operating from these wheels, this mechanism, which is duplicated on each of the wheels 20, comprising a ratchet-wheel 37 rotatable on the shaft 18 and fixed to its co-operating sprocket 21, coöperating with pawls 88 pivoted on the spokes of the wheels 20 and held against the wheels 37 by springs 89 likewise carried by the spokes, whereby as the wheels 20 rotate to the left in Fig. 1, they will drive the ratchets 37 and sprockets 21 for moving the conveyer-chains 28. The provision of this pawl-and-ratchet connection between the drive-wheels 20 and sprockets 21 operates as a differential, whereby in drawing the elevator along a curved path, one of the wheels 20 operates faster than the other, strain upon the driving mechanism cannot be produced, as any unequal rotation of the wheels 20 will be compensated for by slippage of the pawls 88 relative to the ratchet 37.

The connection of the elevator with the wagon is preferably of such a character as to permit a wagon to be readily backed up to the elevator and connected therewith without requiring accurate positioning of the wagon with relation to the elevator, and as a desirable connection between the elevator and wagon, I form the draft-bars in accordance with the illustration in the drawings, a description of which is as follows: The bars 51 converging rearwardly, as illustrated in Fig. 2, are connected together at their rear ends and afford an opening 90 of general curved shape in cross-section adapted to receive the pin 50. The draft-rigging, composed of the bars 47 and 48 and tongue 49, which are pivotally connected with the axle 18 as hereinbefore described, is connected with a cable 91 which extends through an eye 92 in a bail 93 connected with the uprights 25, over a pulley 94 journaled on a bail 95 likewise secured to the uprights 25 and through guides 96 supported on the frames, to the member 70, at which free end it is equipped with a ring 97. The

cable 91 is knotted, as represented at 98, and is adapted to be inserted into the notched portion 99 of the member 70. The cable is so constructed as to cause the tongue 49 to rest upon the extremities of the bars 51 when the ring engages with the notch 99, and be lifted free from the bars 51 for disengaging the pin 50 therefrom when the cable 91 is moved to a position in which the knotted portion 98 interlocks with the walls of the notch 99.

It will be observed from the foregoing description, that the operator sitting upon the seat of the wagon may, by drawing upon the cable 91, lift the draft-rigging of the loader and disengage the pin 50 from the wagon for disconnecting the elevator from the wagon.

The arrangement of parts described permits the operator to back the wagon up to the elevator into an approximate alining position therewith and to connect the elevator with the wagon without leaving the seat of the latter. To accomplish this, the operator would pull the cord 91 for raising the pin out of the plane occupied by the bars 51. As soon as the wagon is backed into a position wherein the pin 50 extends over the space between the bars 51, the operator will release the cable 91 allowing the ring 97 to engage with the walls of the notch 99, whereupon the tongue 49 will fall upon one of the bars 51 with the depending portion of the pin extending into the space between these bars, whereby upon moving the wagon forward, the pin will travel along one of the bars 51 and seat itself in the opening 90, in which position the elevator will be properly centered with relation to the wagon. A depending lug 100 carried on the under side of the tongue 49 serves to prevent undue jerking of the elevator when pulled along by the wagon after the pin 50 is positioned in the opening 90.

The arm 70 is held in the position illustrated in Fig. 1 by means of a cable 101 connected at its opposite ends with the member 70 and with a lug 102 carried by the adjacent frame-member 22, the object of providing the member 70 being that of affording a yielding construction for preventing this arm from becoming impaired in case it should strike against the wagon while the latter and the elevator are moving over uneven ground.

Another feature which I consider of importance in a construction of the character described is that of the formation of the hooks 34, these hooks having their free ends deflected upwardly, as represented at 103, whereby danger of prematurely disengaging the bundles from these hooks while the latter are moving to the point of discharge is obviated.

It will be noted from the foregoing that

the tripping mechanism provided for automatic discharge of the bundles from the hooks is of simple and durable construction and operates positively to perform the tripping function; and that the manner of securing the rods in the different positions described serves to present in the structure the maximum degree of rigidity and stability.

While I have illustrated and described a certain embodiment of my invention, I do not wish to be understood as being limited to such device, as various alterations and changes may be made in the construction without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent is—

1. In an elevator of the character described, the combination of its suitably supported endless conveyer, hooks pivotally connected with said conveyer, and means movable with said hooks for holding said hooks in position for engaging with the material to be elevated, and supporting the same until it reaches a predetermined point at which it discharges from the hooks, and operating to reengage with said hooks after such discharge for securing them in material-engaging position before engaging with the material to be elevated.

2. In an elevator of the character described, the combination of its suitably supported endless conveyer, hooks pivotally connected with said conveyer, and adjustable means movable with said hooks for holding said hooks in position for engaging with the material to be elevated, and supporting the same until it reaches a predetermined point at which it discharges from the hooks, and operating to reengage with said hooks after such discharge for securing them in material-engaging position before engaging with the material to be elevated.

3. In an elevator of the character described, the combination of its suitably supported endless conveyer, hooks pivotally connected with said conveyer, means movable with said hooks for holding said hooks in position for engaging with the material to be elevated and supporting the material until the hooks reach a predetermined point at which they discharge, and means for positively operating said hooks to move them to discharging position, said hook-holding means reengaging with said hooks after such discharge for securing them in material-engaging position before engaging with the material to be elevated.

4. In an elevator of the character described, the combination of its suitably supported endless conveyer provided with hooks pivotally connected with said conveyer for engaging with the material to be elevated, means for releasably holding said hooks in

material-engaging position, and means for operating said hooks when released to cause the material to be discharged therefrom and adjustable for effecting such discharge at any desired point thereon.

5 5. In an elevator of the character described, the combination of its suitably supported endless conveyer provided with hooks pivotally connected with said conveyer for
10 engaging with the material to be elevated, means for releasably holding said hooks in material-engaging position, and automatically operating means for operating said hooks to cause the material to be discharged
15 from the elevator and adjustable for effecting such discharge at any desired point thereon.

6. In an elevator of the character described, the combination with its suitably
20 supported endless conveyer provided with hooks pivotally connected with said conveyer for engaging with the material to be elevated, means for releasably holding said hooks in material-engaging position, and
25 means for operating said hooks to cause them to be moved to a position in which the material will be discharged therefrom, said means being adjustable for effecting such discharge at any desired point from the ele-
30 vator.

7. In an elevator of the character described, the combination of its endless conveyer provided with means for engaging with the material to be elevated, releasable
35 means movable into and out of engagement with said first-named means for holding said first-named means in position for engaging with the material and carrying it into position for dumping, means for re-
40 leasing said releasable means, and means for returning said material-engaging means to the normal operative position, wherein they are again engaged by said releasable means, for the purpose set forth.

45 8. In an elevator of the character described, the combination of its endless conveyer provided with means for engaging with the material to be elevated, releasable means for holding said first-named means
50 in position for engaging with the material and carrying it into position for dumping, means for releasing said releasable means adjustable for effecting such release at any desired point on the elevator, and means for
55 returning said material-engaging means to the normally operative position wherein they are again engaged by said releasable means, for the purpose set forth.

9. In an elevator of the character described, the combination of its endless conveyer provided with means for engaging with the material to be elevated, releasable means for holding said material-engaging means in position for engaging with the ma-
60 terial and carrying it into position for

dumping, means for releasing said releasable means adjustable for effecting such release at any point desired on the elevator, adjustable means for positively operating said material-engaging means to move them
70 to discharging position, and means for returning said material-engaging means to normally operative position, wherein they are again engaged by said releasable means, for the purpose set forth.

10. In an elevator of the character described, the combination of its endless conveyer provided with hooks pivotally connected with said conveyer for engaging with the material to be elevated, means for hold-
80 ing said hooks in material-engaging position until they reach the point of discharge, gear-mechanism operatively connected with said hooks, and a rack supported on the elevator and adapted to engage with said gear-mechanism for operating said hooks to discharge the material therefrom when the hooks reach the point of discharge.

11. In an elevator of the character described, the combination of its endless conveyer provided with means for engaging with the material to be elevated, releasable means for holding said material-engaging means in position for engaging with the material and carrying it to the point of discharge, gear-mechanism operatively connected with said material-engaging means, means for actuating said releasing means to permit said material-engaging means to be moved relative to said conveyer, and a rack
90 on the elevator adapted to engage with said gear-mechanism when said material-engaging means reaches a predetermined point for operating the latter to discharge the material therefrom.

12. In an elevator of the character described, the combination of its endless conveyer provided with hooks pivotally connected with said conveyer for engaging with the material to be elevated, means for hold-
110 ing said hooks in material-engaging position until the hooks reach the point of discharge, gear-mechanism operatively connected with said hooks, and a rack supported on the elevator and adapted to engage with said gear-mechanism for operating said hooks to discharge the material therefrom when the hooks reach the point of discharge.

13. In an elevator of the character described, the combination of its endless conveyer provided with means for engaging with the material to be elevated, spring locking means movable into and out of engagement with said first-named means for releasably holding said first-named means
125 in position for engaging with the material and carrying the same to the point of discharge, and means for operating said spring-locking means at a predetermined point on the elevator to disconnect them from said first-
130

named means, said spring-means reengaging with said material-engaging means after discharge of the material therefrom.

14. In an elevator of the character described, the combination of its endless conveyer provided with means for engaging with the material to be elevated, spring-means for releasably holding said first-named means in position for engaging with the material and carrying the same to the point of discharge, means for operating said releasing means at a predetermined point on the elevator, and means for operating said first-named means for moving the latter to a position for discharging the material therefrom, for the purpose set forth.

15. In an elevator of the character described, the combination of its suitably supported endless conveyer provided with means for engaging with the material to be elevated, releasable spring-means for holding said first-named means in position for engaging with the material and carrying it to the point of discharge, means operating to release said releasable means at a predetermined point on the elevator, means for operating said first-named means to permit the material to be discharged therefrom, and means for moving the hooks relative to said conveyer for positioning them for engagement with the material in which they are again engaged by said releasable means, for the purpose set forth.

16. In an elevator of the character described, the combination of its suitably supported endless conveyer provided with means for engaging with the material to be elevated, releasable means for holding said first-named means in position for engaging with the material and carrying it to a predetermined point on the elevator, gear-mechanism connected with said first-named means, a rack adapted to engage at a predetermined point on the elevator with said gear-mechanism for moving said first-named means to discharging position, means for releasing said releasable means to permit said gear-mechanism to operate, and a second rack adapted to be engaged by said gear-mechanism for moving said first-named means with relation to said conveyer for returning them to normal material-engaging position in which position they are held by said releasable means.

17. In an elevator of the character described, the combination of its endless con-

veyer formed of a pair of endless chains of link-construction, rods connecting the chains together and movable with relation to said chains, means carried by said rods for engaging with the material to be elevated, releasable means normally holding said rods in a position for causing the material-engaging devices carried thereby to engage with the material, means for turning said rods upon said chains to cause the material-engaging means to be moved to a position for discharging the material therefrom, means for releasing said releasable means for permitting said rod-turning means to actuate, and means for returning said rods to normal position in which said releasable means again engage with the rods, for the purpose set forth.

18. In an elevator of the character described, the combination of its suitably supported endless conveyer formed of a pair of endless chains with rods connecting them together and movable with relation to the chains, means connected with said rods for engaging with the material to be elevated, spring-pressed plungers coöperating with said rods and operating when in normal position to hold the rods against turning, means for withdrawing the plungers from engagement with the rods, and means for turning the rods upon the chains to move said material-engaging means to a position for discharging the material carried thereby.

19. In an elevator of the character described, the combination of its endless conveyer provided with hooks pivotally connected with said conveyer for engaging with the material to be elevated, means for holding said hooks in material-engaging position until they reach the point of discharge, means for moving said hooks to cause the material carried thereby to be discharged, said last-named means being adjustable on the frame of the machine, means for adjusting said last-named means upon the machine, and means for returning said hooks to normally operative position relative to the conveyer in which position said hooks are engaged by said first-named means and are positioned for engaging with the material and elevating it to the point of discharge.

SIGFRID JOHNSON.

In presence of—

R. A. SCHAEFER,
JOHN WILSON.