Aug. 28, 1956 K. L. MAGEE 2,760,622

UNIVERSAL ELEVATOR

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Fig. 1.

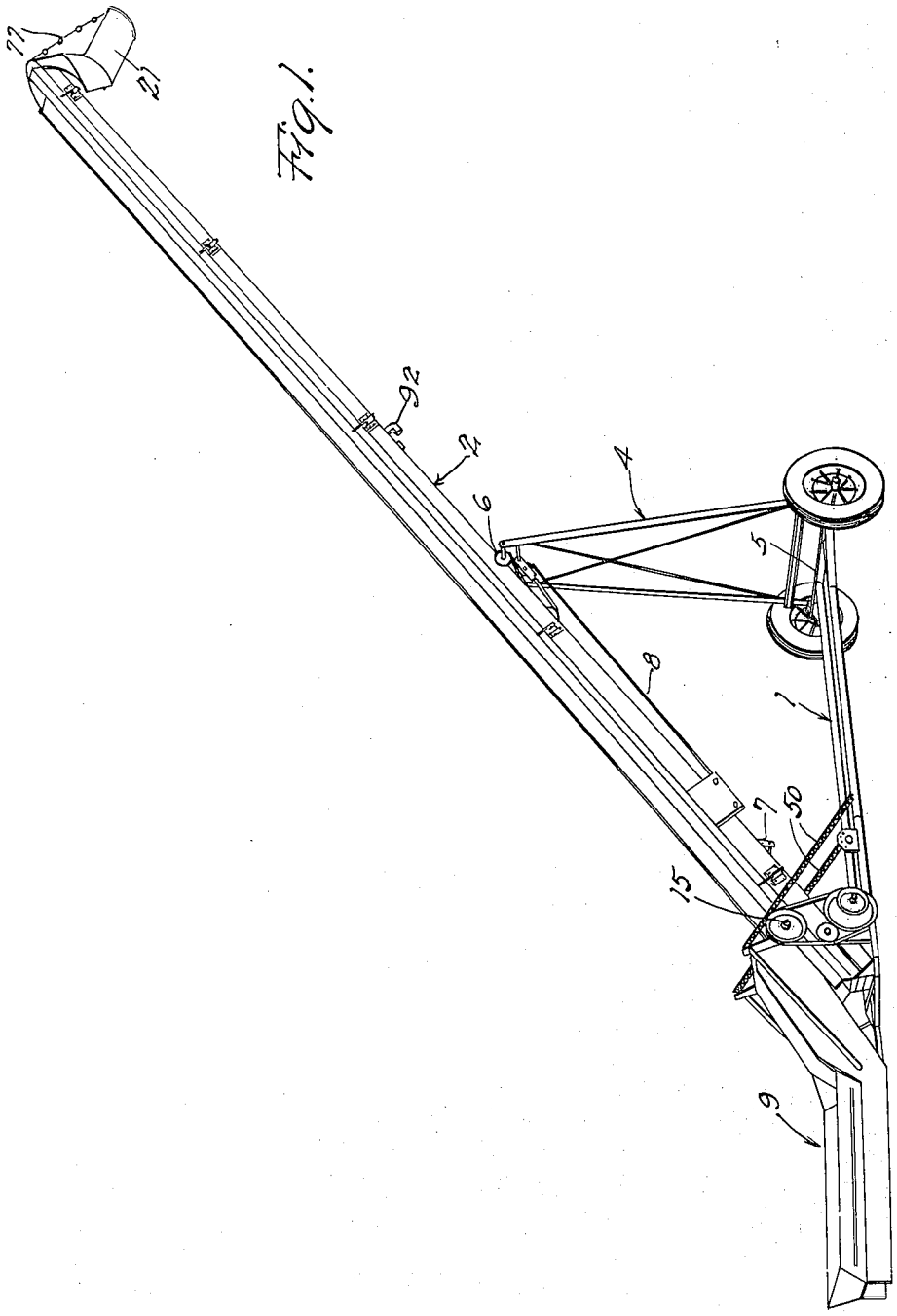

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Fig. 2.

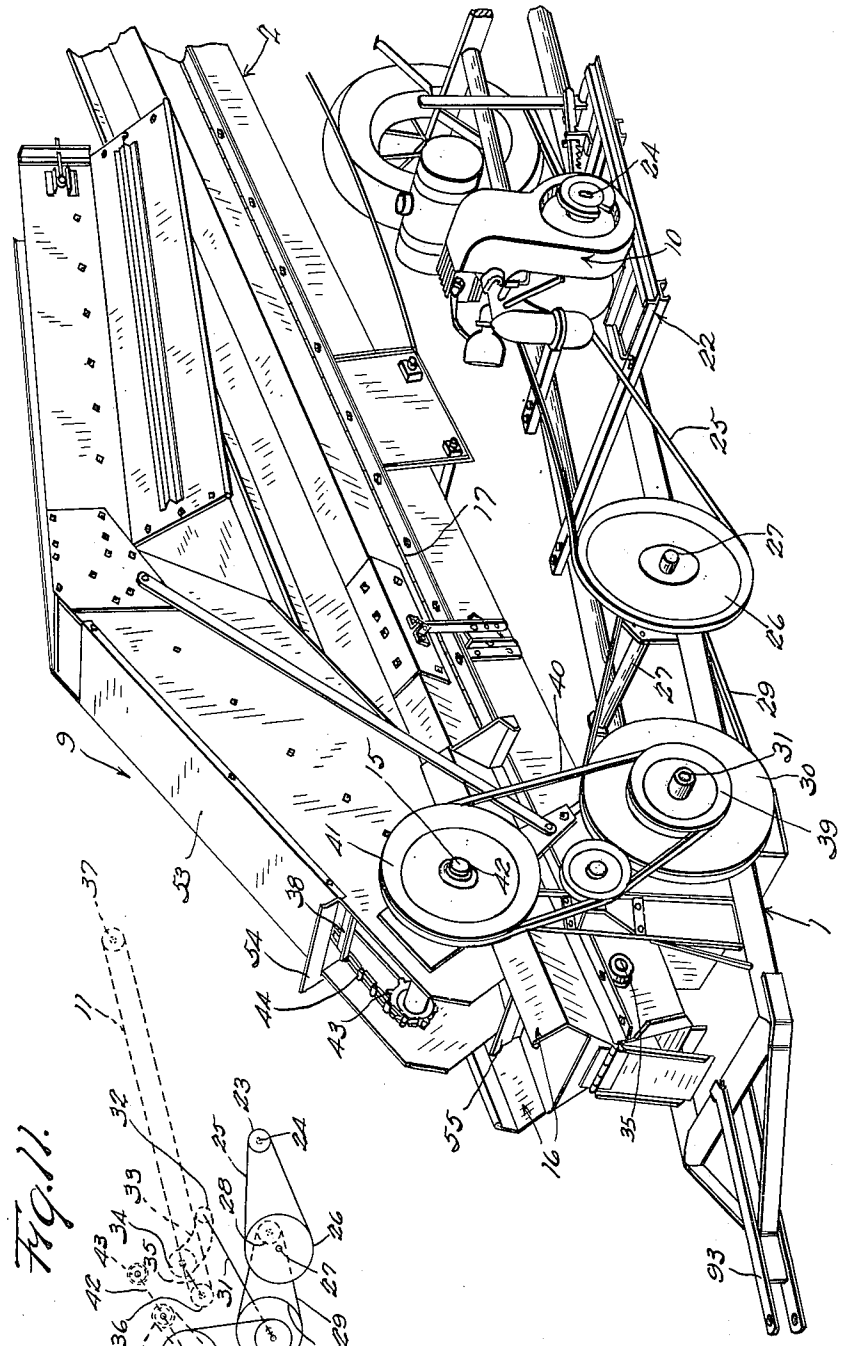

Fig. 1.

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Fig. 3.

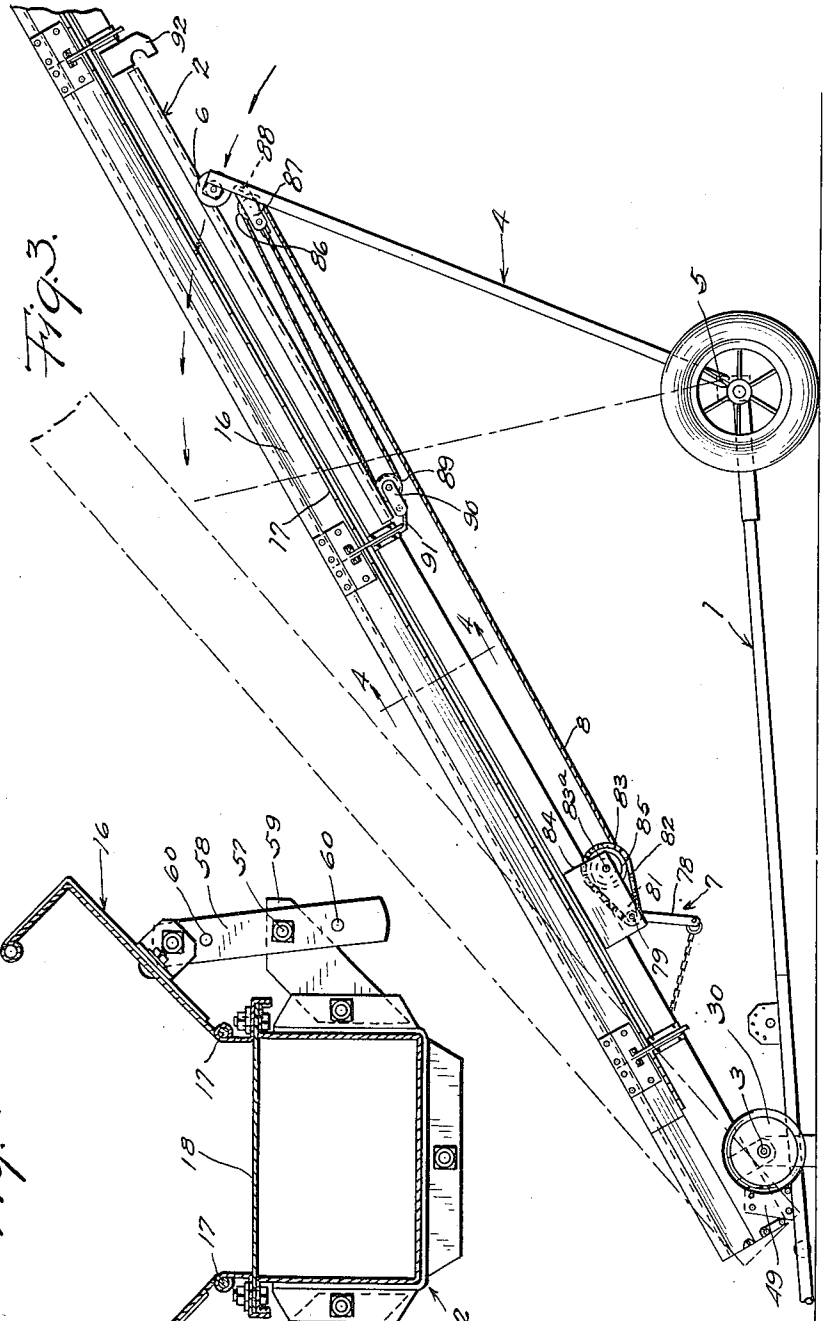

Fig. 4.

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Fig. 5.

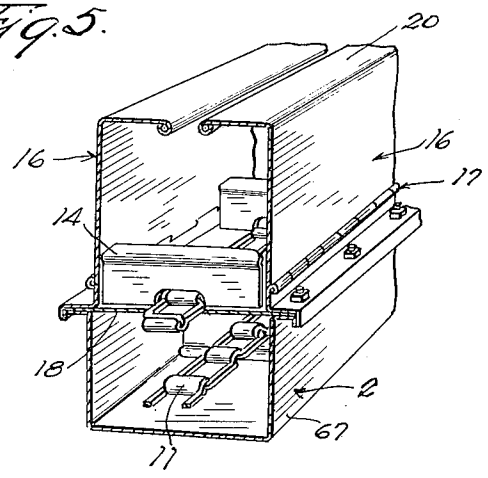


Fig. 6.

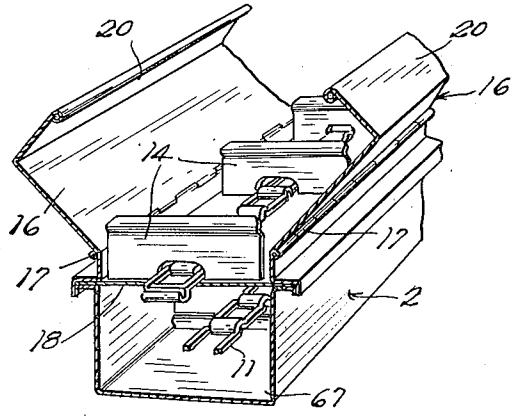
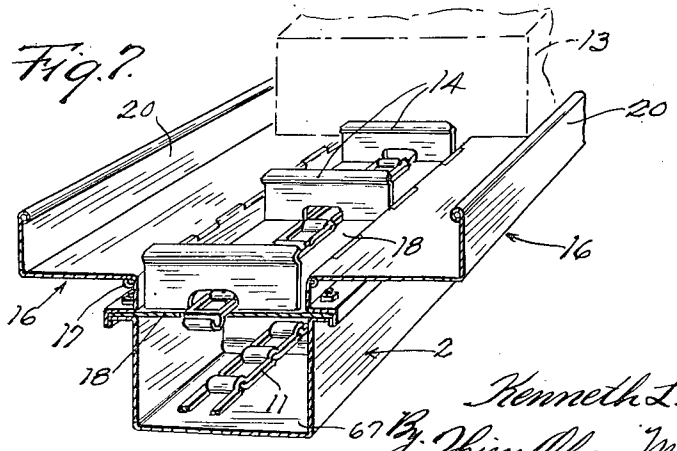


Fig. 7.



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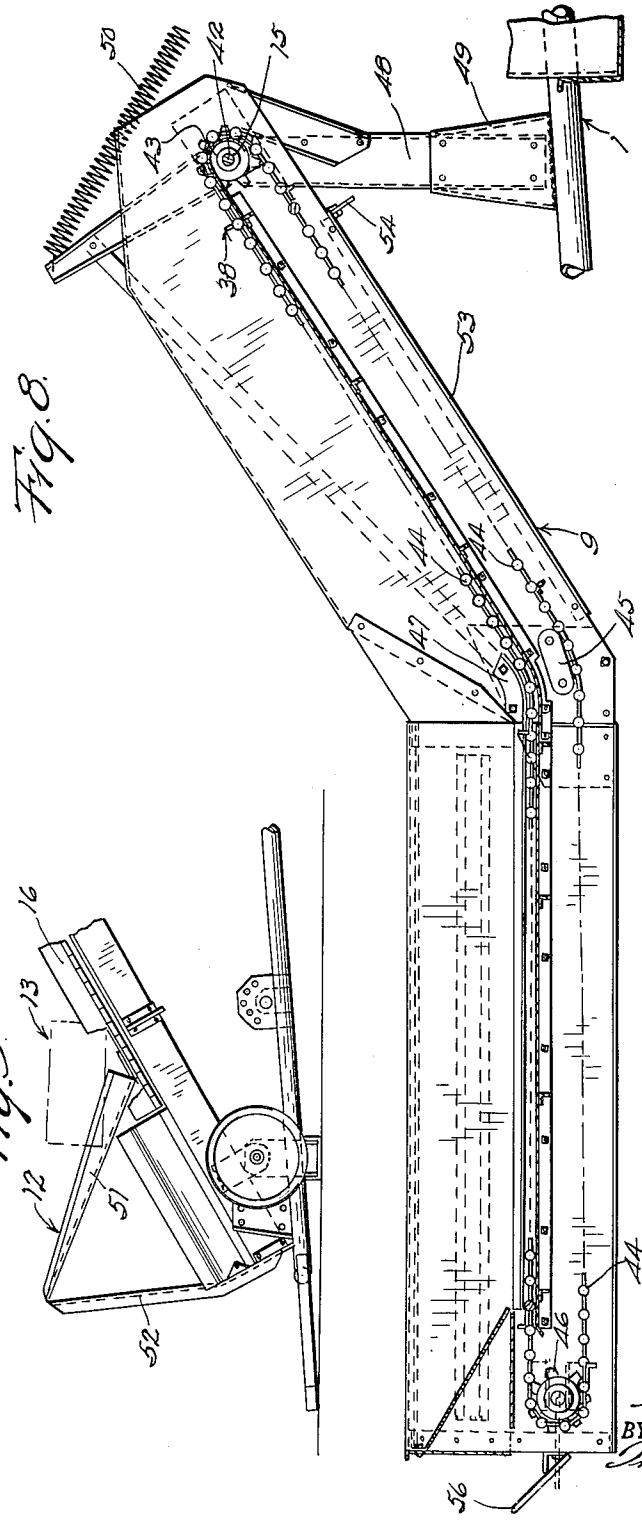

Fig. 8.

Fig. 9.

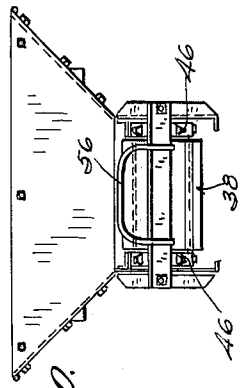

Fig. 10.

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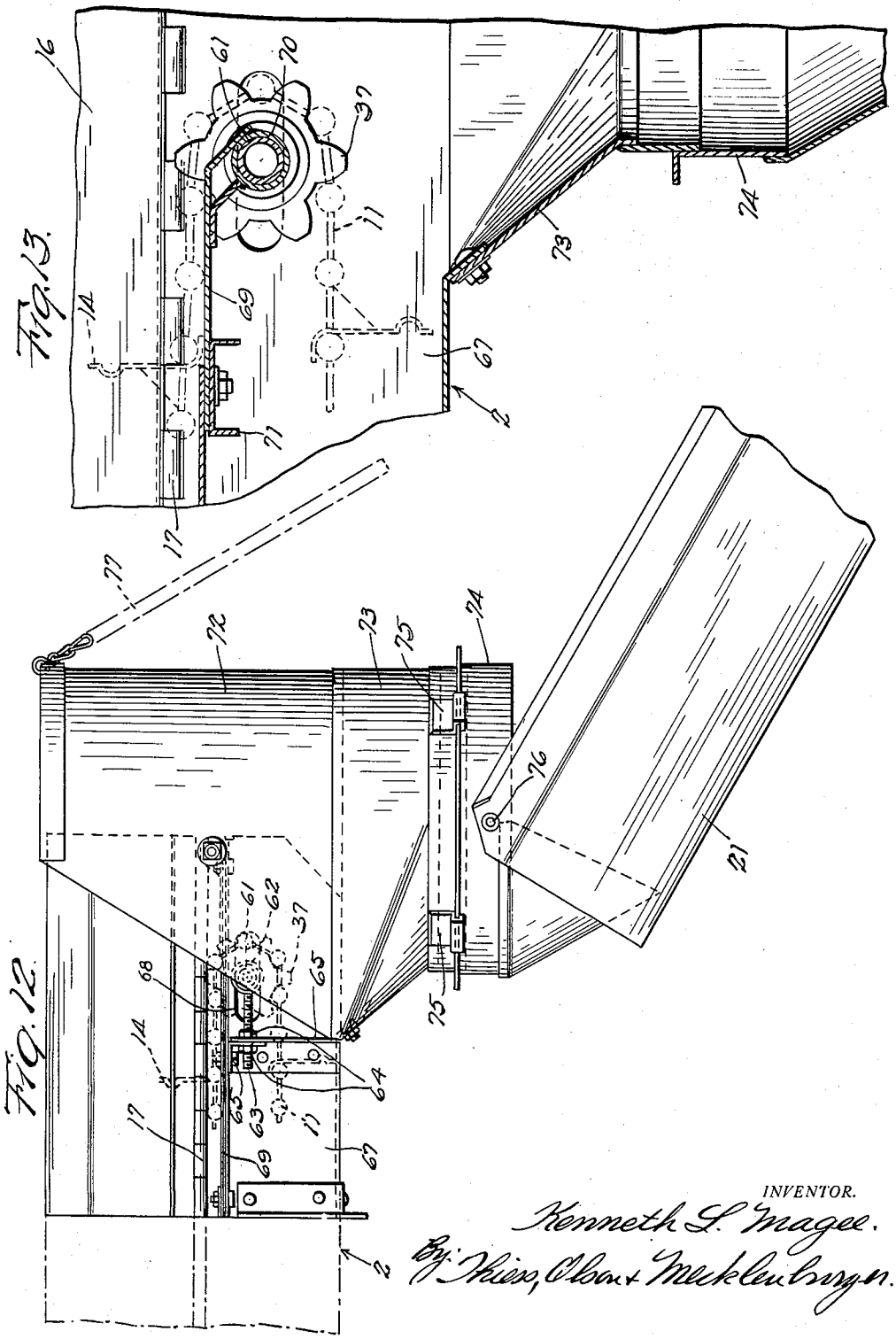

Fig. 13.

Fig. 12.

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Fig. 14.

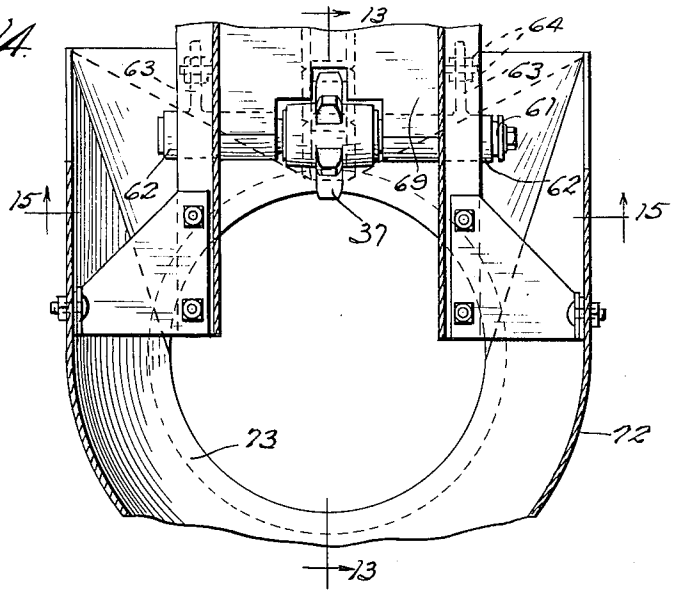
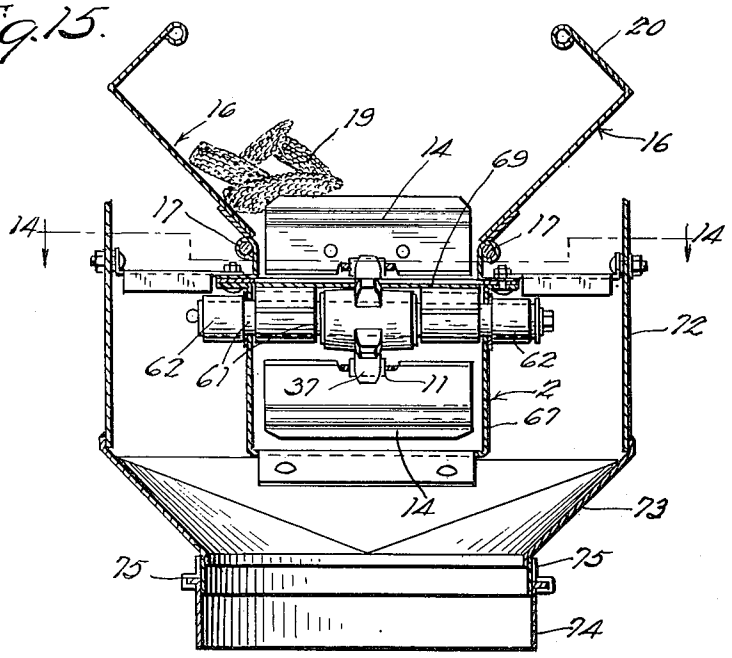


Fig. 15.



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United States Patent Office 2,760,622 Patented Aug. 28, 1956

2,760,622

UNIVERSAL ELEVATOR

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Continuation of application Serial No. 785,413, November 12, 1947. This application May 9, 1951, Serial No. 225,435

5 Claims. (Cl. 198—173)

My invention relates to elevators for handling different types of material.

This application is a continuation of my copending application Serial No. 785,413, filed November 12, 1947 and now abandoned.

One of the objects of my invention is to provide an improved elevator which may be adjusted to handle several types of material.

A further object is to provide improved means for adjusting the length of the bottom of the elevator chute as the elevator chain is tightened or loosened.

A further object is to provide improved means for feeding material to the elevator.

A further object is to provide improved means for folding the feeder over the elevator for transportation.

A further object is to provide improved means for ready attachment and detachment of the conveyor feeder.

A further object is to provide improved means for ready attachment and detachment of the chute feeder.

A further object of my invention is to provide improved transmission means for the elevator and feeder.

A further object is to provide improved discharge means for the elevator.

Further objects will appear from the disclosure and claims.

In the drawings in which an embodiment of my invention is shown,

Fig. 1 is a perspective view of a material elevator, with the feeder in position of use, parts being removed for the sake of clarity;

Fig. 2 is a perspective view of the lower end of the elevator showing the feeder folded in position for transport;

Fig. 3 is a side elevational view of the lower part of the elevator;

Fig. 4 is a cross-sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a detail perspective view showing the side wings of the elevator in position for handling granular material or the like;

Fig. 6 is a view similar to Fig. 5 showing the side wings in an intermediate sloping position for handling interjamming material, for example, ear corn;

Fig. 7 is a view similar to Figs. 5 and 6 showing the side wings folded down flat in position for handling bulky material, such as baled hay or the like;

Fig. 8 is a vertical longitudinal sectional view of the feeder lowered in position for use;

Fig. 9 is a side elevational view of the lower end of the elevator showing the feeder removed and the feed chute substituted therefor for handling material such as baled hay and the like;

Fig. 10 is an elevational view from the left of Fig. 8;

Fig. 11 is a diagrammatic view outlining the transmission from the engine to the elevator conveyor and the feeder conveyor;

Fig. 12 is a side elevational view of the discharge end of the elevator;

Fig. 13 is a vertical axial sectional view of the upper end of the conveyor shown in Fig. 12, the section being substantially on the line 13—13 of Fig. 14;

Fig. 14 is a generally horizontal sectional view of the upper end of the elevator substantially on the line 14—14 of Fig. 15; and

Fig. 15 is a substantially vertical sectional view on the line 15—15 of Fig. 14.

The construction shown comprises a transportable two-wheeled chassis 1, an elevator chute or trough 2 pivotally mounted on said chassis 1 at 3 to swing from a lowered to a raised position, means for raising and lowering the chute 3 comprising a lifter strut or mast 4 pivotally mounted on the chassis 1 at 5 carrying an antifriction roller 6 on its upper end for engaging the chute 3, a windlass 7 and cable 8 for effecting movement of the strut 4 and roller 6 with respect to the chute, and a loader 9 for receiving material to be elevated and delivering it to the elevator adjacent its lower end.

An internal combustion engine 10 is mounted on the chassis 1 for driving the endless conveyor chain 11 which operates in the elevator chute 2. The loader 9 may be attachable and detachable with respect to the chute since in handling certain kinds of material the loader may be useful, and in handling other kinds of material the loader may not be desirable. In order to facilitate the placing of packaged material such as baled hay on the endless conveyor, a feed chute 12 may be secured to the lower end of the trough which slopes downwardly toward the endless conveyor so that articles such as bales of hay 13 placed on this inclined chute will be seized by the conveyor flights 14 and carried upwardly. The loader 9, when attached to the elevator, may be mounted for pivotal movement with respect to the elevator to swing about an axis at 15 from a lowered position of use (Figs. 1 and 8) to a raised position (Fig. 2) above the elevator chute for transport.

In order to enable the endless chain conveyor 11 to be used for handling different kinds of material, such for example as granular material, interjamming or interdigitating material or uniformly packaged material, the sides 16 of the chute or trough in which the flights 14 of the endless chain conveyor operate are made pivotally adjustable about axes at 17 extending longitudinally of the trough. Typical or illustrative of different types of material which may be handled by the conveyor are shelled corn, ear corn, and bales of hay.

For handling baled hay, for example, the feeder 9 is removed, the bale chute 12 placed in position (Fig. 9) and the wing portions 16 are placed in their widest spread lowermost position (Figs. 7 and 9) in which the bales of hay 13 may be received crosswise from the bale chute 12, with their opposite ends resting on the conveyor wings 16 and their medial portions spaced from the bottom 18 of the channel portion of the chute 2 and engageable by the successive flights 14 of the conveyor. In handling interjamming material, such as ear corn 19 (Fig. 15), lump fuel, etc., the wings are set in an intermediate position (Figs. 6 and 15) in which they slope inwardly and downwardly, tending to cause material resting against the sloping wing portions to gravitate inwardly toward the channel portion. In handling this interjamming material, such as ear corn, the material may be placed in the conveyor chute by the feeder in quantities so as to substantially fill the space between the wing portions. The flights of the endless conveyor will engage the ears of corn lying in the trough, and the ears of corn will be so interjammed or interlocked that the entire body of material between the wings will be carried upwardly as the flights travel. The bent-over edges 20 of the wing portions will serve to prevent the ears of corn from slopping over the edges of the wings. In handling shelled

corn, the wings **16** are placed in their extreme raised position (Fig. 5) in which the main portions of the wings **16** are in substantially vertical position. The shelled corn may be fed from the feeder to the conveyor in quantities which will fill the conveyor chute above the level of the upper edges of the flights. The layer of shelled corn above the upper level of the flights will rest as a sort of ribbon on the material lying between the conveyor flights and will be carried upwardly along with the lowermost layer of shelled corn.

In order to distribute the material delivered from the upper end of the endless conveyor, a swiveled discharge spout **21** is provided which may be swung about an upright axis to deliver the material received by the spout at the end portion of the arc defined by the swinging end of the spout.

The engine **10** of any suitable type is mounted on a platform **22** secured to the chassis **1**. The transmission from the engine to the endless conveyor comprises a drive pulley **23** (Fig. 11) on the motor shaft **24** (Figs. 2 and 11), a belt **25** running over this drive pulley, a pulley **26** over which this belt **25** runs mounted on a shaft **27** mounted in suitable bearings on the chassis **1**, a pulley **28** mounted on a shaft **27**, a belt **29** running over the pulley **28**, a pulley **30** over which the belt **29** passes, a shaft **31** mounted on the chassis **1** rotatable with the pulley **30**, a sprocket **32** secured to the opposite end of this shaft **31**, a sprocket chain **33** running over this sprocket, a driven sprocket **34** over which this sprocket chain runs, a shaft **35** rotatably mounted on the chute **2** on which this sprocket **34** is mounted, and a sprocket **36** rotatable with this shaft **31** over which the conveyor chain **11** runs. The upper end of the conveyor chain runs over a sprocket **37** at the upper end of the elevator chute **2**.

The drive for the feeder conveyor **38** (Figs. 2, 8, and 11) is from a pulley **39** rotatable with the shaft **31**. This drive comprises a belt **40** running over this pulley **39**, a pulley **41** over which this belt runs, a shaft **42** rotatable with this pulley about which the feeder swings from lowered to raised position, and a pair of sprockets **43** rotatable with this shaft about which the feeder conveyor chains **44** run.

As shown in Figs. 8 and 10, the feeder conveyor chains **44** run over the sprockets **43**, thence under guide means **45** for the lower intermediate portion of the sprocket chain, thence over the front sprocket wheels **46**, and thence rearwardly under the curved guides **47** for the upper intermediate portion of the sprocket chain.

In order to remove the feeder from the elevator, the supporting and bearing brackets **48** on which the drive shaft **42** is mounted are detached from the uprights **49** at the front end of the chassis, the lifting springs **50** are disconnected from the chassis, and the feeder is lifted away from the chassis. The slide or chute **14** which may be used when handling baled hay is then substituted for the feeder, as shown in Fig. 9, by attaching the slide portion **51** of the chute to the folded-down wings **16** of the elevator chute and by attaching the lower ends of the uprights **52** of the chute to the lower end of the elevator chute.

In order to prevent or lessen leakage of material between the feeder and elevator, the feeder chute **53** is provided with a lip **54** (Figs. 2 and 8), which when the feeder is swung down into position of use engages an upstanding lip **55** at lower end of the elevator chute.

To facilitate raising the feeder from its lowered position of use to its raised position for transport, the lower rearward end of the chute may be provided with a lifting handle **56** (Figs. 8 and 10).

As shown in Figs. 4, 5, 6, and 7, the side wings **16** of the elevator chute may be secured in any one of three adjusted positions. This adjustment is accomplished by removing the bolt **57** which connects the swinging supporting arm **58** and the supporting bracket **59**, bringing the hinged wing portion **16** to the desired position and reinserting the bolt **57** in a different hole **60** in the arm **58**.

In order to adjust the upper conveyor sprocket **37** (Figs. 12, 13, 14, and 15) for tightening or loosening the conveyor chain **11**, the shaft **61** which carries the upper sprocket is mounted in a pair of journal members **62** to each of which is secured a stud **63** having a threaded portion on which are threaded two nuts **64** on opposite sides of the angle iron **65** and angle bar **66** which extends between the wall of the housing **67** which encloses the lower run of the conveyor. These walls are slotted at **68** to provide clearance for the shaft **61** and guide it in its movement.

In order that the bottom of the elevator chute may accommodate itself to the adjustment of the sprocket wheel **37**, it is provided with a sliding terminal section **69** at its upper end which is secured so as to move in unison with the sprocket shaft **61**. For this purpose the upper discharge end of this slidable end plate is bifurcated to straddle the sprocket **37** and secured to a pair of anchor collars **70** which surround the sprocket shaft **61** so as the sprocket shaft moves, the terminal plate **69** moves with it. The lower or rearward end of this terminal bottom plate rests on and is guided by a cross plate or channel member **71** extending between the sides of the elevator chute.

The discharge end of the elevator chute **2** is provided with material guiding apparatus comprising a semi-cylindrical hood **72** detachably secured to the upper end of the elevator chute, a cylindro-conical funnel-like member **73** secured to the lower skirt portion of the hood, a collar **74** secured by clips **75** to swivel on the lower end of the funnel-like member having a scoop-like discharge plate secured to its lower edge, and the discharge chute **21** pivotally mounted on the collar **74** at **76** and held in any desired position of angular adjustment by means of a supporting chain **77** secured at its lower end to the discharge chute **21** and detachably and adjustably secured at its upper end to the upper end of the hood **72**. When the elevator is used for handling bales the detachable hood **72** and the parts carried thereby are removed to enable the delivery of the bales from the upper end of the elevator chute **2**.

The apparatus for raising and lowering the elevator about the fulcrum **5** at its lower end (Figs. 1 and 3) comprises the lifter frame **4** rockably mounted on the chassis **1** adjacent its rear end, the antifriction roller **6** secured at the upper end of the lifter frame and engaging the lower side of the elevator chute **2**, a manually operated crank **78** journalled at **79** on the elevator chute adjacent its rear end, and transmission from this crank to the upper end of the lifter frame, enabling the upper end of the frame to be drawn forwardly for raising the elevator chute and enabling the cable **8** to be payed out to allow the elevator chute to move downwardly under gravity for lowering. The transmission from the crank to the upper end of the lifter frame comprises a sprocket **81** mounted on the shaft on which the crank is mounted, a sprocket chain **82** running over this sprocket, a large sprocket **83** over which this sprocket chain runs, a shaft **83a** journalled on plates **84** secured to and extending downwardly from the elevator chute, a winding-up drum **85** rotatable with this large sprocket, the cable **8** secured to this drum, a pulley **86** rotatably mounted on a clevis **87** pivoted to the lifter frame at **88** over which this cable passes, and a pulley **89** rotatably mounted in a sheave or pulley block **90** secured to the bracket **91** extending downwardly from the elevator chute over which pulley the cable **80** passes, the end of the cable being anchored to the pulley block or clevis **87**. In order to take the strain off the cable when the elevator is lowered to its lowermost position, a hook-like abutment plate **92** is secured underneath the elevator chute having a semicircular opening to receive and engage the antifriction roller **6**.

In order to enable the elevator to be transported readily, the front end of it is provided with a clevis 93 which may be attached to a tractor. The elevator chute is shown as being made in four sections which are detachably secured together by means of connecting plates and angles.

Further modifications will be apparent to those skilled in the art and it is desired, therefore, that the invention be limited only by the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An endless conveyor elevator construction comprising a conveyor chute, an endless propeller operating in said chute having spaced blade-like flights secured thereto, said chute comprising a medial material-guiding channel portion in which said propeller operates and a pair of side wing material-guiding portions pivotally mounted adjacent the opposite side edges thereof to swing from a lowered substantially co-planar position, in which large objects placed on the conveyor will extend across the channel portion and be supported by the wing portions and will have their medial portions engaged by said conveyor flights, to an intermediate inwardly and downwardly sloping positon in which interjamming smaller objects placed in the conveyor chute will be confined by said wing portions and urged by gravity toward said channel portion and be jammed together so that the confined objects will be carried along by said flights, said flights extending above the level of the adjacent opposing wing portion, said side wings having guiding and positioning flanges extending at an angle to their object supporting portions for engaging the edges of the large objects for centering and guiding them, said object-supporting portions forming a part of the conveyor chute and supporting the large objects for longitudinal movement by the propeller, each flight substantially filling the cross section of the channel.

2. An endless conveyor construction comprising a conveyor chute, an endless propeller operating in said chute having spaced blade-like flights secured thereto, said chute comprising a medial material-guiding channel portion in which said propeller operates and with respect to which the flights are in grain-tight proximity and a pair of side wing material-guiding portions pivotally mounted adjacent the opposite side edges thereof to swing from a lowered substantially co-planar position, in which large objects placed on the conveyor will extend across the channel portion and be supported by the wing portions and will have their medial portions engaged by said conveyor flights, to an intermediate inwardly and downwardly sloping position in which interjamming smaller objects placed in the conveyor chute will be confined by said wing portions and urged by gravity toward said channel portion and be jammed together so that the confined objects will be carried along by said flights and to a third substantially upright raised position in grain-tight proximity to the ends of the blade-like flights in which granular material may be placed in the chute to lie in the channel position and be confined by the wing portions, each flight substantially filling the cross section of the channel.

3. An endless conveyor elevator construction comprising a conveyor chute, an endless propeller operating in said chute having spaced blade-like flights secured thereto, said chute comprising a medial material-guiding channel portion in which said propeller operates and a pair of side wing material-guiding portions pivotally mounted adjacent the opposite side edges thereof to swing from a spread-apart position in which relatively large objects placed on the conveyor will be guided by the wing portions and will be engaged by said conveyor flights, to

a raised position in which smaller objects placed in the conveyor chute will be confined by said wing portions and urged by gravity toward said channel portion, said flights extending above the level of the adjacent opposing wing portion, said side wings having guiding and positoning flanges extending at an angle to their object supporting portions for engaging the edges of the large objects for centering and guiding them, said object-supporting portions forming a part of the conveyor chute and supporting the large objects for longitudinal movement by the propeller, each flight substantially filling the cross section of the channel.

4. An endless conveyor construction comprising a conveyor chute, an endless propeller operating in said chute having spaced blade-like flights secured thereto, said chute comprising a medial material-guiding channel portion in which said propeller operates and with respect to which the flights are in grain-tight proximity and a pair of side wing material-guiding portions pivotally mounted adjacent the opposite side edges thereof to swing from a lowered position, in which interjamming objects placed in the conveyor chute will be confined by said wing portion and urged by gravity toward said channel portion and be jammed together so that the confined objects will be carried along by said flights, to a substantially upright raised position in grain-tight proximity to the ends of the blade-like flights, in which position small granular material may be placed in the chute to lie in the channel portion and be confined by the wing portions and be carried along by said flights, each flight substantially filling the cross section of the channel.

5. An endless conveyor construction comprising a conveyor chute, an endless propeller operating along said chute having spaced blade-like flights secured thereto, said chute comprising a medial material-guiding channel portion in which said propeller operates and with respect to which the flights are in grain-tight proximity and a pair of side wing material-guiding portions pivotally mounted adjacent the opposite side edges thereof to swing from a lowered substantially co-planar position, in which large objects placed on the conveyor will extend across the channel portion and be supported by the wing portions and will have their medial portions engaged by said conveyor flights and advanced thereby, to an intermediate inwardly and downwardly sloping position in which interjamming smaller objects placed in the conveyor chute will be confined by said wing portions and urged by gravity toward said channel portion and be jammed together so that the confined objects will be carried along by said flights and to a third substantially upright raised position in grain-tight proximity to the ends of the blade-like flights, in which position small granular material may be placed in the chute to lie in the channel portion and be confined by the wing portions and be carried along by said flights, each flight substantially filling the cross section of the channel.

References Cited in the file of this patent

UNITED STATES PATENTS

620,232	Dingell	Feb. 28, 1899
1,056,734	Brown	Mar. 18, 1913
2,195,567	Glidden et al.	Apr. 2, 1940
2,356,434	Russell	Aug. 22, 1944
2,446,472	Graf	Aug. 3, 1948

FOREIGN PATENTS

585,536	France	Dec. 10, 1924