

No. 638,954.

Patented Dec. 12, 1899.

H. H. CARR.
PORTABLE ELEVATOR.

(Application filed Dec. 5, 1898.)

(No Model.)

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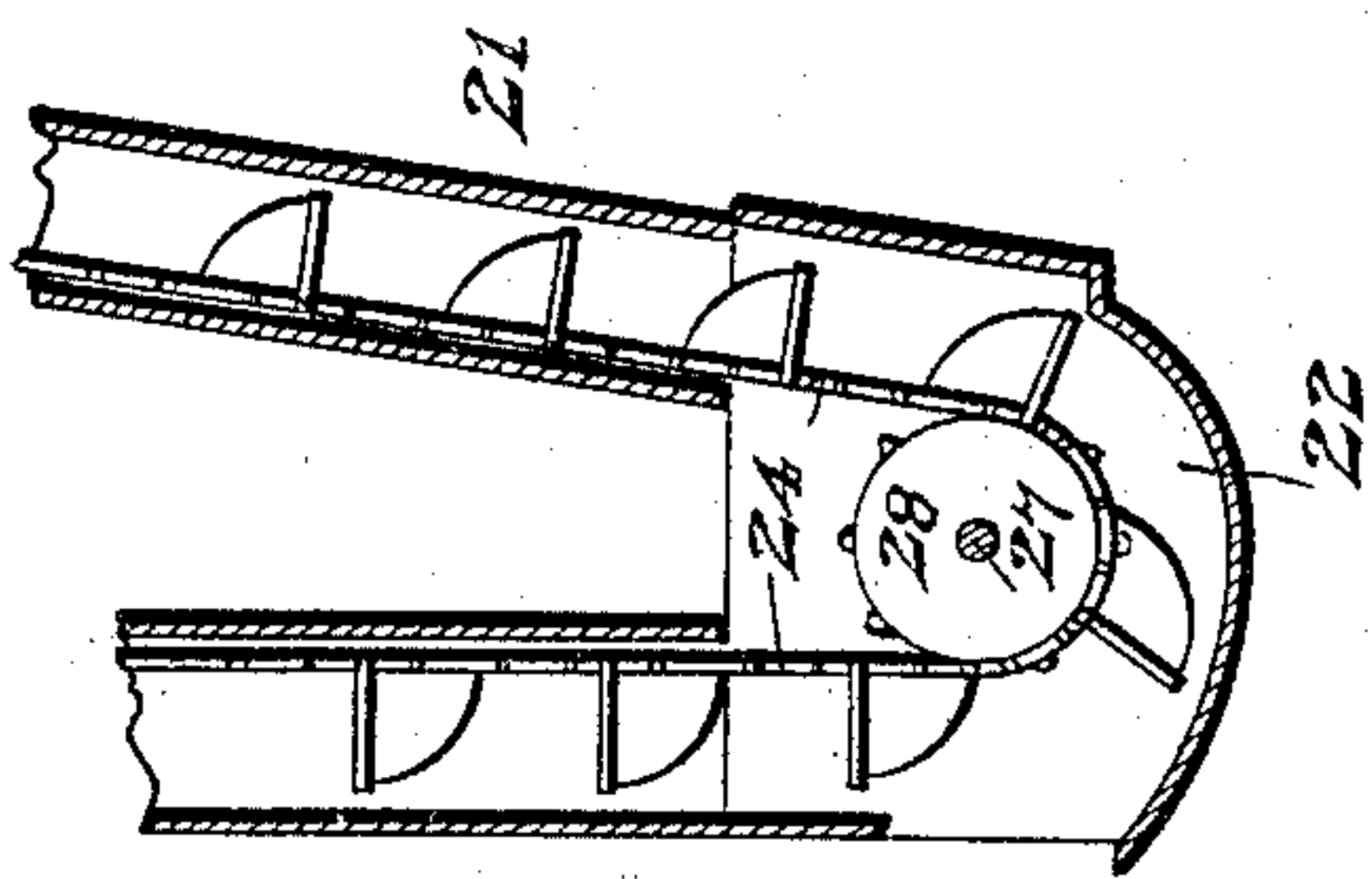


Fig. 7.

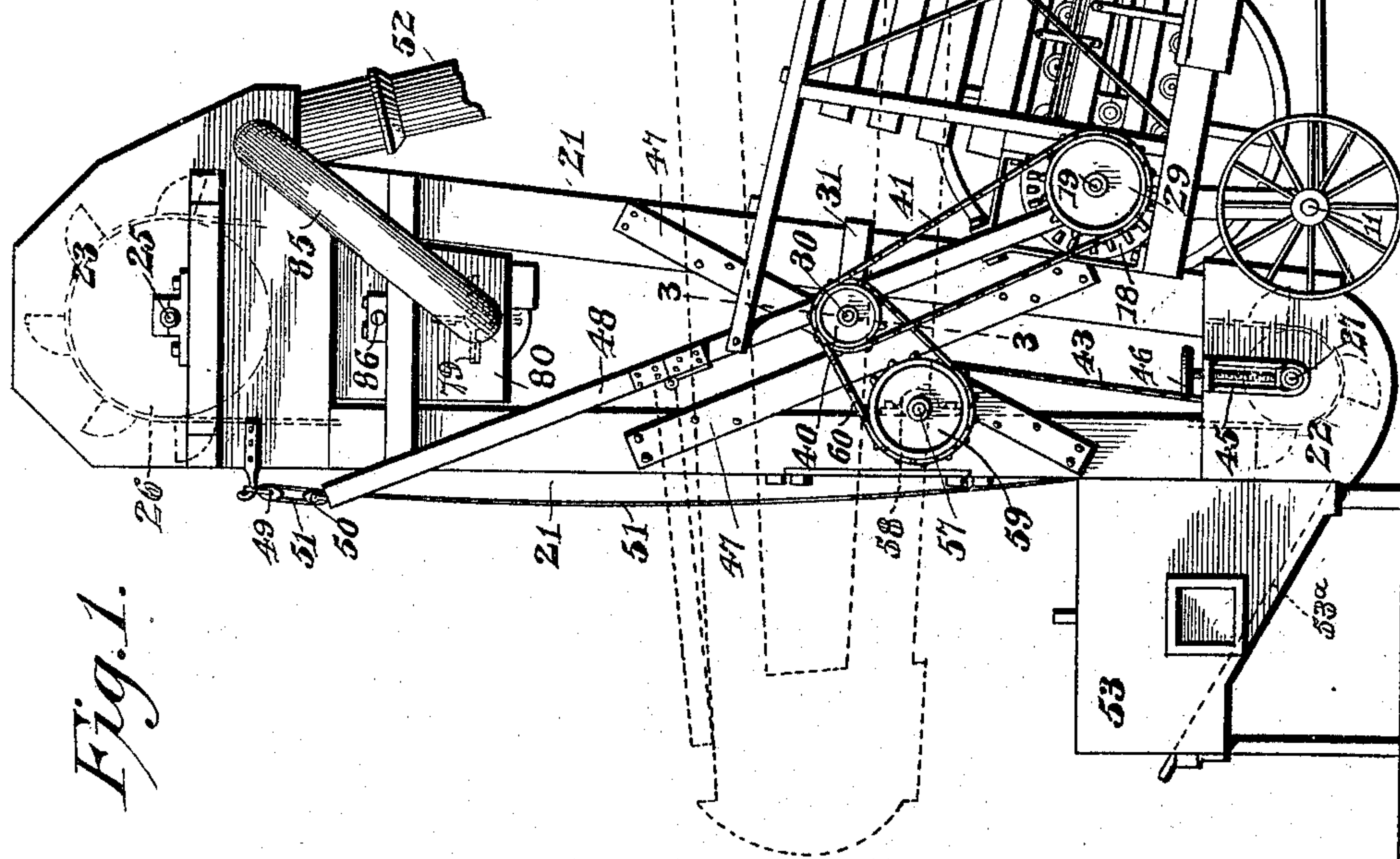


Fig. 1.

Witnesses

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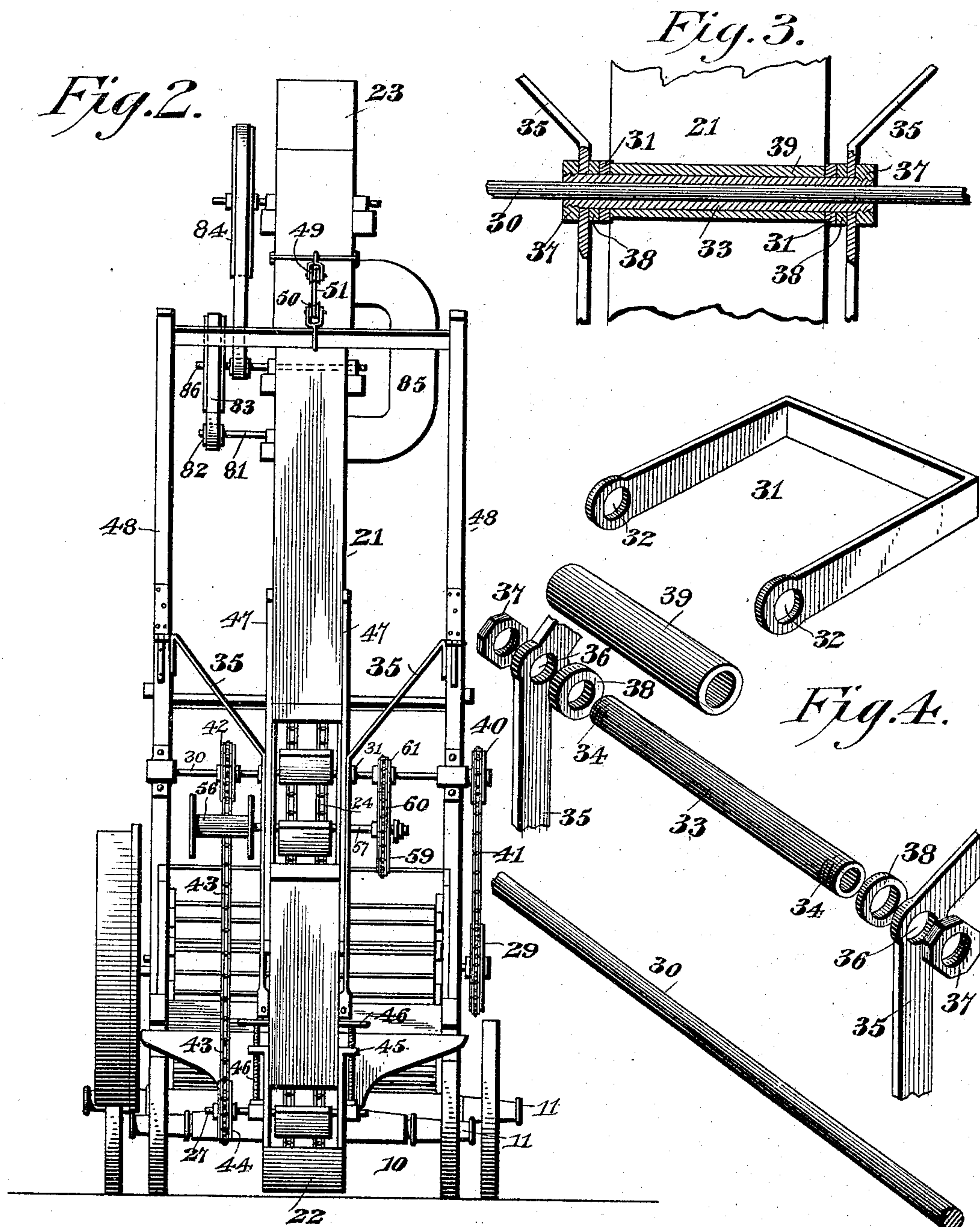
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Witnesses

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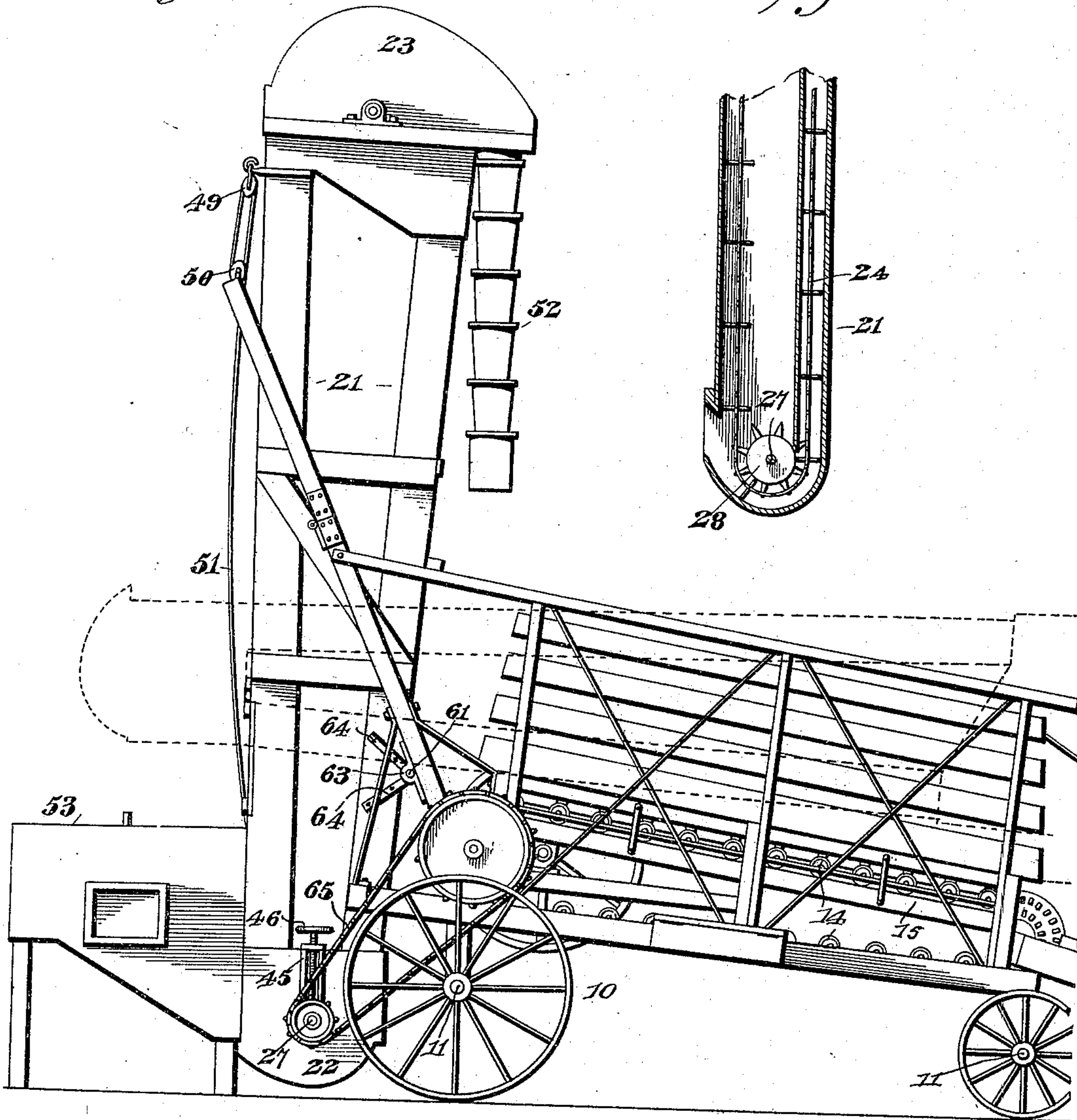
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Fig. 5.

Fig. 8.



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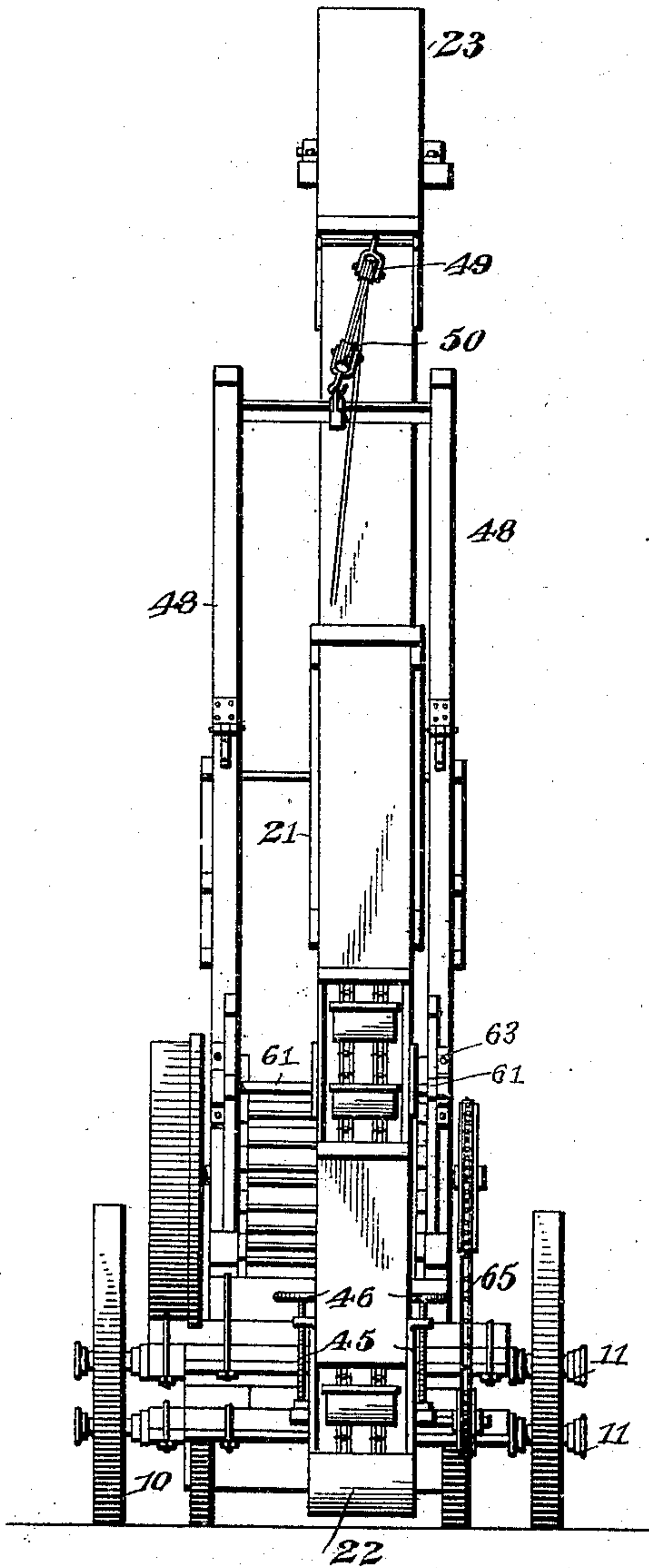
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4 Sheets—Sheet 4

Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY H. CARR, OF CHICAGO, ILLINOIS.

PORTABLE ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 638,954, dated December 12, 1899.

Application filed December 5, 1898. Serial No. 698,327. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. CARR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have
5 invented a new and useful Portable Elevator, of which the following is a specification.

This invention relates to a portable elevator and loader for the expeditious and economical handling of grain, seeds, and ground sub-
10 stances, as well as for other materials in bulk; and it is more particularly designed for transferring grain from wagons into bins or other receptacles, or from wagons into grain-cars, or vice versa, whereby the manual labor in-
15 separable from the slow and expensive way of shoveling by hand is obviated.

A further object of the invention is to provide a portable elevator which may be folded compactly upon the power mechanism to ren-
20 der the apparatus portable bodily from one place to another, and this foldable-elevator mechanism and the power mechanism for driving the operative elements thereof are combined together in such a manner that the
25 elevator may be folded without disconnecting the power-transmitting appliances, thus making provision for the expeditious adjustment of the elevator into operative position for service.

30 A further object of the invention is, in the preferred embodiment thereof, to arrange the supporting and driving means for the elevator in a manner to secure freedom in the rotation of the driving-shaft and easy swinging
35 adjustment of the foldable elevator without friction or binding on either the shaft or the elevator pivotal devices, notwithstanding that the driving-shaft constitutes the axis of adjustment to the elevator.

40 With these ends in view the invention consists in the novel combination of mechanisms and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

45 To enable others to understand the invention, the preferred embodiment thereof is illustrated in the accompanying drawings, forming a part hereof, and in which—

50 Figure 1 is a side elevation illustrating the preferred construction of the elevator in its working position, the dotted line showing the elevator folded compactly upon the power

mechanism. Fig. 2 is a front elevation of the apparatus represented by Fig. 1. Fig. 3 is an enlarged detail sectional view on the plane indicated by the dotted line 3 3 of Fig. 1, showing the counter-shaft and pivotal shaft for the elevator and the means by which the elevator boot or casing is pivotally hung concentric with the counter-shaft. Fig. 4 is a detail perspective view of parts of the device shown by Fig. 3 for pivotally supporting the elevator boot or casing. Fig. 5 is a side elevation of another embodiment of the portable apparatus, and Fig. 6 is a front elevation of the structure shown by Fig. 5. Figs. 7 and 8 are detail sectional elevations of modified types of the endless elevator within a boot or casing.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

In carrying the invention into practice, a portable frame or truck 10 is provided for the power mechanism and to sustain the elevator mechanism in its upright operative position, as well as in the folded inoperative position. This portable frame or truck is supported by wheeled axles 11, and as one means for moving the apparatus from one place to another the truck is equipped with a draft-tongue 12, to which a team may be hitched. This portable apparatus (represented by the accompanying drawings) embraces a power mechanism which is represented as embodied in a structure known to those familiar in the art as a "treadmill," adapted for operation by horse-power; but in its broad aspect the invention is not restricted to this particular type of power mechanism, because it is evident that a skilled mechanic in embodying the invention may employ equivalent power mechanisms, such as a horse-power sweep, an electric motor, a gasoline engine, or other motive-power apparatus. The motive-power mechanism is mounted on or carried by the portable truck for the purpose, primarily, of furnishing the power for operating the elevator and the other mechanisms which enter into the construction of the apparatus in its entirety; but, as will be evident to a skilled mechanic, the motive-power mechanism may, if desired, embody devices for the propulsion of the entire apparatus bodily from one place

to another in a manner similar to a traction-engine, thus dispensing with the draft-tongue 12.

The power mechanism, in the form of a treadmill, embraces an endless traveling platform, consisting of a series of slats or bars flexibly joined together and provided with antifriction-rolls 14, arranged to ride on suitable guide-tracks 15, which are supported in fixed positions on the frame of the treadmill. One end of the endless traveling platform is supported by an idle drum 16 on a shaft 17, which is mounted in proper bearings on the frame or truck of the apparatus, and at its other end the traveling platform passes around the driving-drum 18 in a manner to actuate the latter. This driving-drum is mounted on a shaft 19, which is journaled in proper bearings on the frame or truck, and on this shaft 19 is secured a member of the gear by which the power is transmitted to the elevator mechanism to drive the latter. The horse or other animal required for the operation of the treadmill is enabled to ascend thereto or descend from the traveling platform by means of the inclined platform 20, one end of which is suitably connected to the frame or truck, while its opposite end rests upon the ground or on the wheels.

The elevator mechanism is disposed at one end of the motive-power mechanism, and this elevator mechanism is hung or pivoted on a horizontal axis, so that in operative position the elevator is upright or vertical; but when the apparatus is to be transported the elevator mechanism is folded to a horizontal position upon the motive-power mechanism, whereby all the parts of the apparatus are disposed compactly for convenience in transportation. This elevator mechanism is equipped with a boot or casing, which in its entirety is indicated by the numeral 21, and this boot or casing comprises a receiving-foot 22, a head 23, and inclined legs or members, which are joined firmly to the foot or head, so as to make the structure present a substantial rigid appearance. The elevator proper is in the form of an endless belt or a pair of linked chains 24, which are equipped with buckets or flights of any suitable pattern known to those skilled in the art, and this endless elevator is operatively arranged within the legs, the foot or head of the elevator-casing to travel therein. The endless elevator passes over an idle shaft 25, journaled in proper bearings within the head 23, and this shaft has pulleys or sprocket-wheels 26 to accommodate the belt or chain 24. The endless belt or chain also passes around pulleys or sprockets 28 on the elevator driving-shaft 27, which is journaled in proper bearings at the foot 22, and one end of this shaft 27 is extended beyond the foot of the boot for the reception of a gear element, by which the shaft 27 may be rotated for the propulsion of the endless elevator.

The shaft 19, which is driven by the mo-

tive-power mechanism, is equipped with a master-gear 29, from which the power is taken for transmission to the endless elevator, and in the preferred embodiment of this invention the power-transmission gearing embraces as one element thereof a counter-shaft 30, which serves as the axis of movement for the elevator mechanism in adjusting the latter to its folded and unfolded positions.

The elevator boot or casing 21 is equipped at a point intermediate of its length with a yoke 31, which is arranged to embrace one leg or member of said elevator boot-and is firmly secured thereto by any approved means. This yoke has its ends extended or projected into the space between the legs or members of the boot or casing, and the extended ends of said yoke are formed with eyes or openings 32. A tubular pivotal shaft 33 passes through the eyes or openings of the yoke, and this shaft 33 has its ends threaded exteriorly, as at 34. (See Figs. 3 and 4.) An upright frame 48 is secured firmly to the portable truck or frame, and to this frame is firmly secured the ends of angular braces 35, and these braces are provided at points intermediate of their lengths with openings 36, which are coincident with the openings 32 of the yoke, so as to permit the threaded ends 34 of the tubular pivotal shaft 33 to pass through said openings in the angular braces. The pivotal shaft and the braces are united firmly together by means of the nuts 37, which are screwed on the threaded ends 34 of the shaft and bear against the braces 35, and the ends of the yoke and the sides of the braces are spaced relatively to each other by means of washers 38, which are fitted on the tubular pivotal shaft 33 and are interposed between the braces and the yoke, whereby the elevator boot or casing may turn freely in a vertical plane on its pivotal connection with the inclined fixed frame. To prevent the arms of the yoke 31 from collapsing or bending under the weight of the elevator-boot, a brace-sleeve 39 is fitted loosely on the pivotal shaft 33, so as to engage with the ends of the yoke 31. The counter-shaft 30 passes through and is journaled for rotation freely in the pivotal shaft, which, it will be observed, has its ends extended to open through the braces 35, and at one end this shaft 30 is provided with a sprocket wheel or pulley 40, which is connected by an endless chain or belt 41 with the master gear or pulley 29 on the shaft 19, which is actuated by the motive-power mechanism. This shaft 30 is also provided with a sprocket wheel or pulley 42, which is connected by a chain or belt 43 to the sprocket wheel or pulley 44 on the driving-shaft 27 of the elevator, and thus the counter-shaft 30 is operatively connected with the shaft 19 and with the shaft 27 for the purpose of transmitting the motion of the motive-power mechanism to the endless elevator.

It will be observed that the elevator boot or casing is pivotally supported by devices

which are concentric with the axis of the counter-shaft 30, and that this counter-shaft constitutes one element of the transmitting mechanism between the power mechanism 5 and the elevator driving-shaft, and by thus combining and arranging the several mechanisms the elevator boot or casing is free to swing on a horizontal axis in folding or unfolding the same without slackening the gear connections from the motive-power mechanisms to the elevator driving-shaft or without throwing the transmitting-gearing out of active relation to the elevator or the power mechanism whereby the elevator mechanism 15 may be easily and quickly adjusted for service from its folded position to its operative position. At the same time the swinging adjustment of the elevator may be effected without binding the counter-shaft 30 or the tubular pivotal shaft, thus reducing friction and wear on these elements to a minimum.

The driving-shaft 27 for the endless elevator is mounted in slidable bearings 45, connected to the foot of the boot or casing 21, and to these bearings are connected the adjusting-screws 46, which are properly supported on the foot 22 for the purpose of taking up the slack which may exist in the endless elevator, thus maintaining the latter in a taut condition to secure maximum efficiency in the practical service thereof. The legs or members of the elevator-boot may be stayed by the cross-braces 47, which are properly secured to the boot or casing.

The elevator is mounted or hung on the substantial frame 48, which is arranged in an inclined position with relation to the portable truck or frame 10, and this inclined frame is solidly secured to the truck-frame 40 and braced by suitable stays to make it very substantial for supporting the weight of the boot or casing and its contained parts. The upper end of the fixed inclined frame 48 is hinged to the lower portion and equipped with a hoisting-tackle for conveniently moving the frame to its horizontal or upright positions, and as one embodiment of this tackle it is shown as consisting of a block or sheave 49, properly attached to the head of the boot or casing, another block or sheave 50, connected to the upper extremity of the inclined frame, and an operating-cable 51, which is reeved through the blocks or sheaves and is led or conducted down to the ground within convenient reach of the attendant, the free end of said cable being adapted for fastening to a cleat or other suitable device to maintain the boot or casing against tilting when it is in an upright position. By hinging the upper end of the frame so as to swing to the rear it can be folded down substantially even with the chute, as shown in dotted lines in Fig. 1, after the chute has been lowered to its horizontal position. When it is desired to elevate the chute, the hinged portion of the frame is swung into its elevated position and the rope is drawn through the blocks

sheaves of the hoisting-tackle until the chute has been drawn into its desired position. The location of the hinge upon the rear side 70 of the frame will prevent the upper portion from swinging forward of a straight line with the lower portion of the frame.

A flexible spout or chute 52 is attached to the head 23 of the elevator-boot, and this chute may be carried into a car for conveying the grain thereto.

As one means for supplying the grain to the elevator a stationary feeder 53 is arranged contiguous to the foot 22 of the elevator, and this feeder has an inclined bottom 53^a, which delivers the grain directly to a suitable opening in one side of said foot 22 of the elevator-casing, as shown by Figs. 1 and 5. When the feeder is employed in connection with the elevator, the grain may be discharged into the feeder directly from a wagon or other vehicle, and this feeder operates to supply the grain automatically to the elevator to be taken up by the buckets or flights thereof.

A winch or drum 56 is mounted on the foldable elevator-boot and is driven by suitable connections with the motive-power mechanism. This winch or drum is carried by a shaft 57, the latter mounted in bearings 58, secured to the elevator-boot. Said shaft has a sprocket wheel or pulley 59, which is engaged by a chain or belt 60, the latter also engaging with a sprocket or pulley 61 on the counter-shaft 30, whereby the winch-shaft is adapted to be driven by the counter-shaft for power purposes.

In the embodiment of the invention represented by Figs. 5 and 6 the elevator-boot is pivotally hung by a cross-shaft 61 in bearings 63, which are secured firmly to the inclined frame 48. The connection between the elevator-boot and the pivotal shaft is effected by means of brackets 64, which are secured firmly to the boot and are fitted loosely on the pivotal shaft 61, but it is evident that the arrangement of the brackets, the shaft, and the bearings therefor may be reversed. The driving-shaft for the endless elevator is belted or geared directly to the shaft which is driven by the motive-power mechanism, and this direct gear connection may be effected by an endless chain or belt 65, which is fitted to aligned sprocket wheels or pulleys on the power mechanism and the elevator driving-shaft. The construction represented by Figs. 5 and 6 embodies essentially the same elements disclosed by Figs. 1 and 2, except the transmitting-gearing and the means for pivotally suspending the elevator-boot, and said embodiment of the invention may also embrace the haulage winch or drum, as will be readily understood.

In operation the elevator boot or casing is adjusted to its upright position, the feeder is placed in operative relation to the foot of said casing, and the spout is arranged to deliver to a car or other receptacle. The treadmill having been set in motion, the shaft 19 is rotated

tated and the motion thereof is transmitted by the gear connections to the driving-shaft 27 of the elevator. The elevator is propelled to carry the grain from the foot of the boot and deliver the same to the spout 52, by which the grain is conveyed to the car or receptacle. When it is desired to transport the apparatus or move it from one place to another, the cable of the tackle is unfastened and the elevator-boot is allowed to swing or turn to the horizontal position shown by dotted lines, thus folding the elevator upon the portable truck or frame.

The motive-power mechanism shown by Figs. 5 and 6 of the drawings is adapted for operation by one horse; but it is evident that a two or three horse treadmill may be used, if desired.

The apparatus is also equipped with a pneumatic cleaner mechanism by which grain as it leaves the head of the elevator may have the dust, dirt, and light refuse eliminated therefrom. In this adaptation of the invention a suction-fan 79 is employed on the upright elevator for connection operatively with the head thereof, and said fan is adapted to be driven by the motive-power mechanism. The fan-casing 80 is secured to the elevator between the legs of the boot or casing and adjacent to the head, and in proper bearings on the fan-casing is journaled the fan-shaft 81, one end of which is prolonged to receive a pulley 82, around which passes a belt 83, that is driven by a pulley 84, secured to one end of the idle shaft at the head of the elevator, whereby the fan-shaft is driven by the elevator. The casing of the fan is connected by a suction tube or pipe 85 with the head of the elevator-casing at a point close to the attachment of the spout to said elevator-head, and as the fan is rotated it creates a current of air through the elevator-head of sufficient strength to carry off the dust, dirt, and light refuse through the tube or pipe 85 to the fan-casing, from which the refuse is discharged through suitable ports.

Changes may be made in the form and proportion of some of the parts, while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what is claimed is—

1. A portable grain-elevator comprising a wheeled truck, a foldable conveyer boot or casing carried by said truck, an endless conveyer within said boot or casing, and a fan or blower carried wholly by the conveyer-boot and foldable therewith, said fan or blower having a blast-pipe connected with the delivery end of the conveyer-boot, and the fan-shaft geared to a conveyer-shaft to be propelled thereby, substantially as described.

2. A portable grain-elevator comprising a

wheeled truck, a foldable conveyer boot or casing carried by said truck, an endless conveyer within said boot or casing, a fan or blower carried wholly by and foldable with the conveyer-boot at the upper end thereof and having said fan-casing connected by a blast-pipe with the delivery end of the conveyer-boot, and multiplying-gearing between the fan-shaft and a conveyer-shaft whereby the fan or blower is driven from said conveyer, substantially as described.

3. A portable grain-elevator comprising a wheeled truck, an inclined frame, 48, fixed to said truck, a conveyer boot or casing, pivoted at a point intermediate of its length to and within said inclined frame, said conveyer-boot having its upper end foldable over and upon the wheeled truck, and adapted to have its lower end abut against the truck on the unfolding of the boot or casing to its upright position, a conveyer within said boot or casing, and a hoisting-tackle connected to the upper parts of the foldable conveyer-boot and the fixed frame, substantially as described.

4. A portable grain-loader comprising a wheeled truck, the rear end of which is provided with a rigid frame, perforated braces secured to the frame, a tubular shaft through said perforations, a yoke secured to the shaft with the ends of its arms adjacent to the braces, a sleeve upon the tube, means for clamping said sleeve, yoke arms and braces rigidly together, an elevator secured within the yoke, and a shaft through the tubular shaft, the ends of which are provided with means for operating the conveyer of the elevator.

5. A portable grain-loader comprising a wheeled truck carrying a motive-power mechanism, an upright frame fixed to one end of said truck, a foldable elevator boot or casing adapted to be folded to an inoperative position over the truck or to assume an upright operative position at one end thereof, a tubular shaft fast with said frame, a yoke embracing the boot or casing and fitted on said tubular shaft, a sleeve also fitted on the tubular shaft and engaging the ends of said yoke, an elevator within the boot or casing, a counter-shaft passing through the tubular shaft, and suitable gearing, substantially as described.

6. A portable grain-loader comprising a wheeled truck carrying a motive-power mechanism, an upright frame situated at one end of and secured firmly to said truck, brackets fast with said frame, an elevator boot or casing fitted between the brackets, a tubular shaft having the threaded ends clamped in said brackets, a yoke embracing the boot or casing and fitted loosely on the tubular shaft, a counter-shaft passing through the tubular shaft, an elevator, and suitable gearing, substantially as described.

7. A portable grain-loader comprising a wheeled truck having a motive-power mech-

anism, an elevator boot or casing foldable on
said truck, a shaft, 30, geared to the motive-
power mechanism and to an elevator within
said boot or casing, and a winch or drum
5 journaled on the boot or casing to be foldable
therewith and geared to the shaft, 38, to be
driven thereby, substantially as described.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses.

HENRY H. CARR.

Witnesses:

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ARTHUR J. FLYNN.