

No. 862,874.

PATENTED AUG. 13, 1907.

J. BEACH.  
PORTABLE ELEVATOR.  
APPLICATION FILED AUG. 1, 1906.

3 SHEETS—SHEET 1.

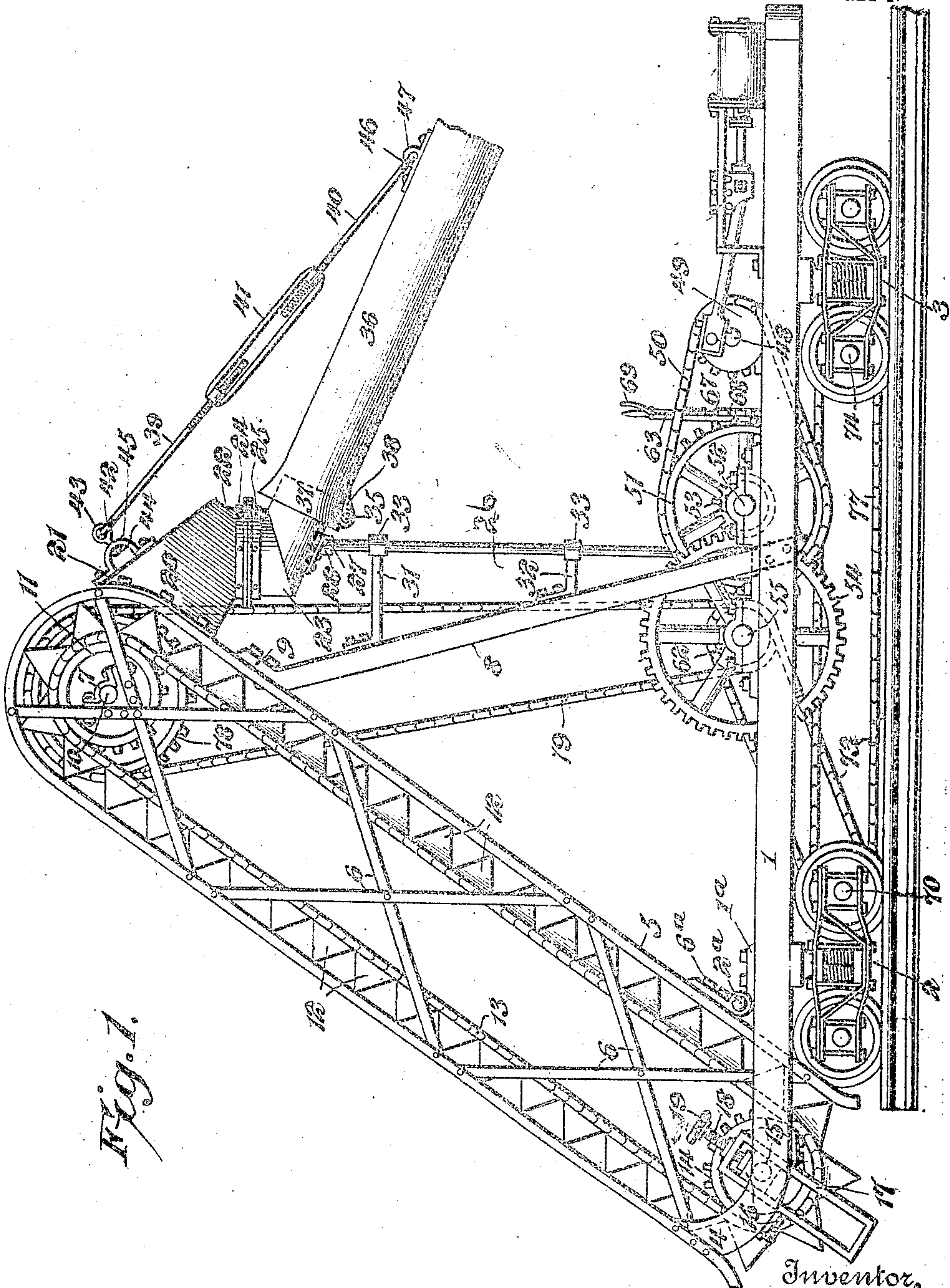


Fig. 1.

Witnesses

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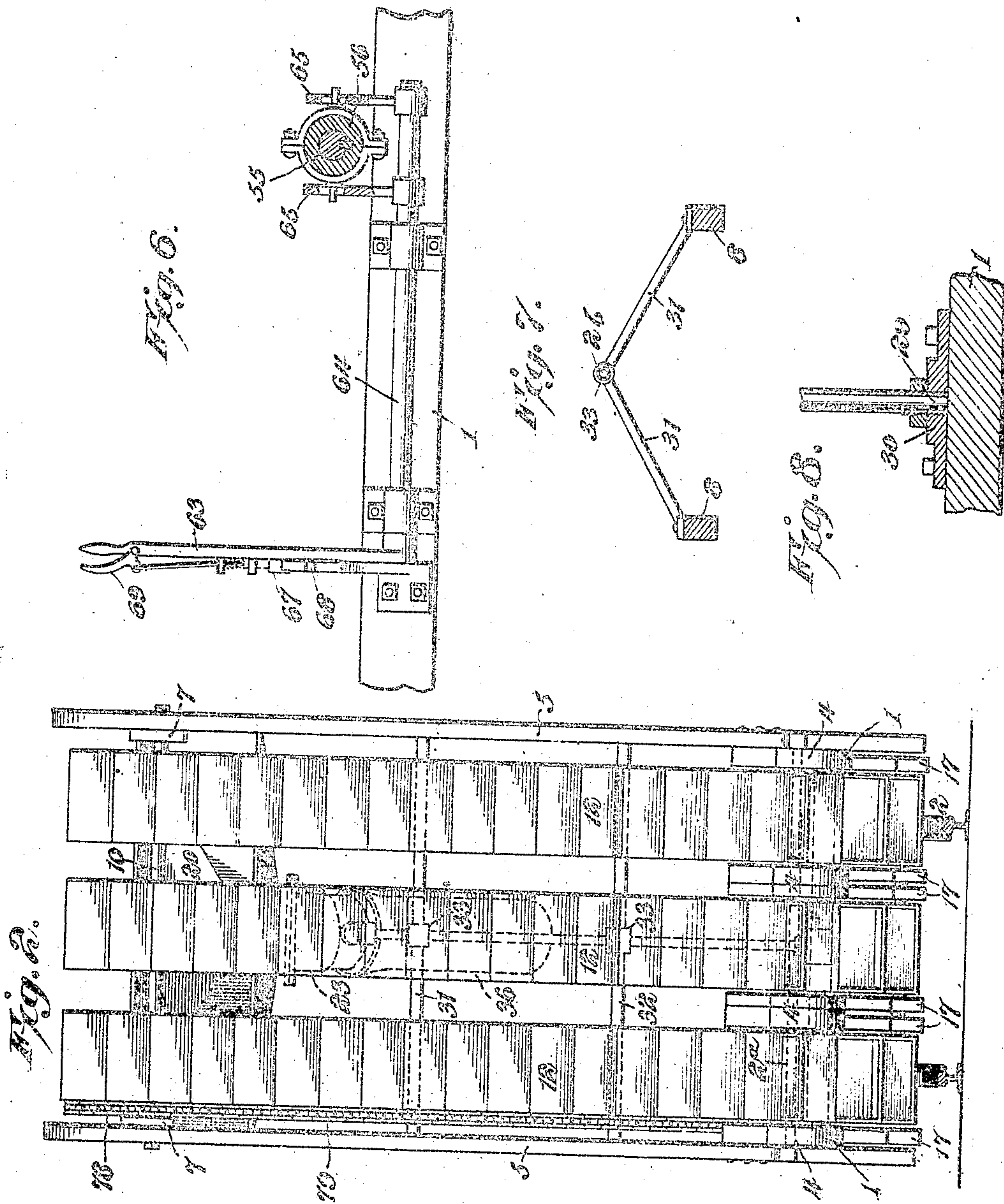


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PATENTED AUG. 13, 1907.

J. BEACH.  
PORTABLE ELEVATOR.  
APPLICATION FILED AUG. 1, 1900.

3 SHEETS—SHEET 2.



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No. 862,874.

PATENTED AUG. 13, 1907.

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PORTABLE ELEVATOR.  
APPLICATION FILED AUG. 1, 1903.

3 SHEETS—SHEET 3.

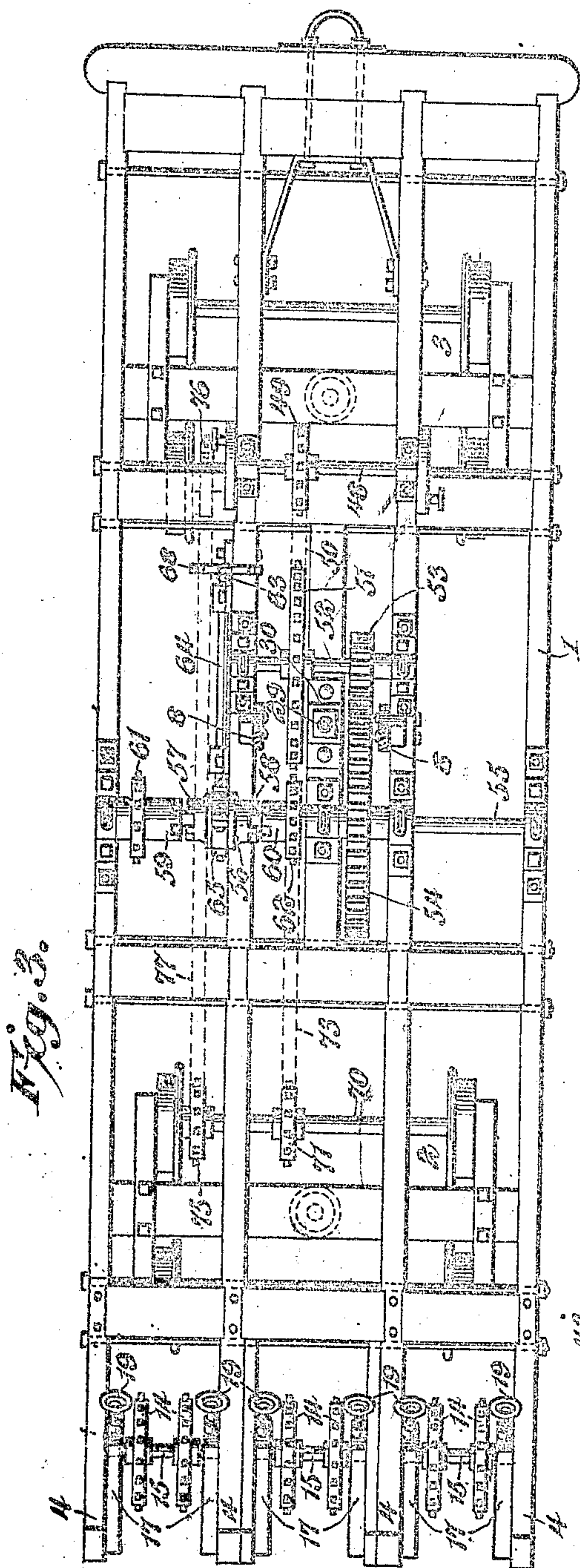


Fig. 3.

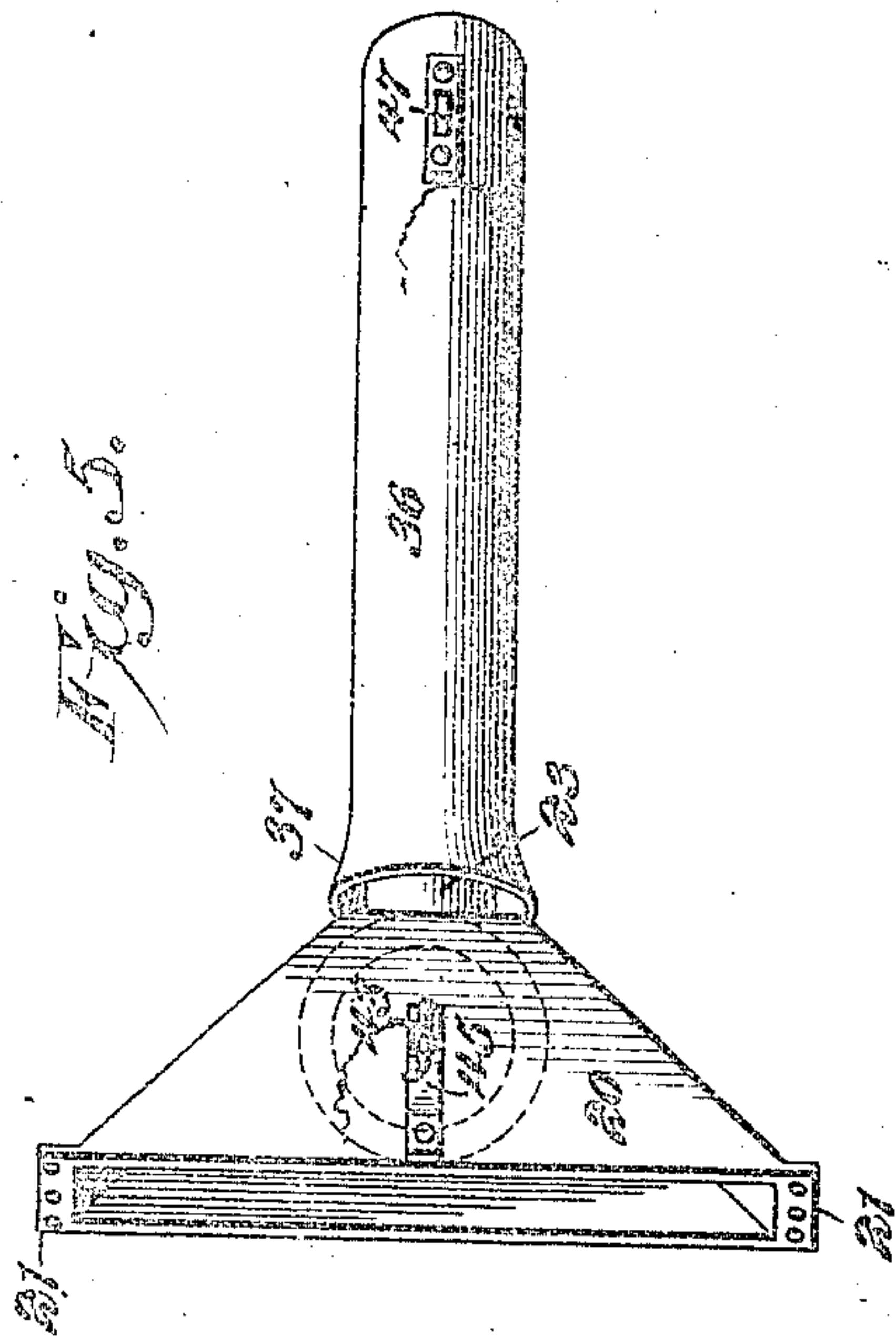


Fig. 5.

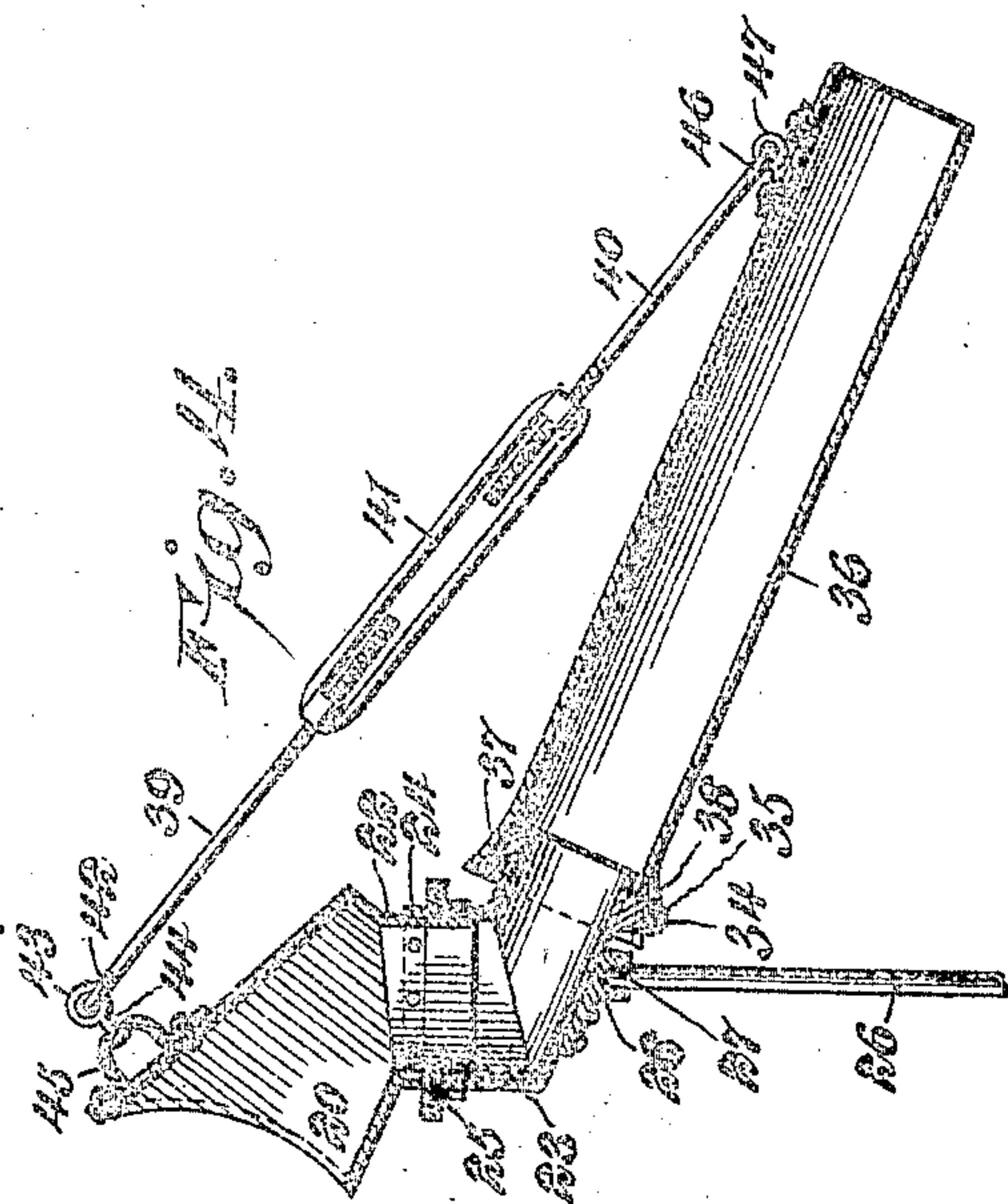


Fig. 11.

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# UNITED STATES PATENT OFFICE.

JOHN BEACH, OF HARWOOD MINES, PENNSYLVANIA.

## PORTABLE ELEVATOR.

No. 862,874.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed August 1, 1906. Serial No. 328,796.

*To all whom it may concern:*

Be it known that I, JOHN BEACH, a citizen of the United States, residing at Harwood Mines, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Portable Elevator, of which the following is a specification.

The invention relates to improvements in portable or traveling elevators.

The object of the present invention is to improve the construction of traveling or portable elevators, and to provide a simple and comparatively inexpensive elevator designed for handling various loose materials in bulk, and adapted to rapidly elevate the same from a bank or pile for loading cars or wagons, or for delivering the material to a conveyer line, or other place.

A further object of the invention is to provide an elevator of this character, having means for either moving it backward or forward to advance it into the material to be elevated, or for operating a plurality of endless conveyers for carrying the material upward.

Another object of the invention is an adjustable spout or chute, which will be capable of a vertical swinging movement and a horizontal rotary movement for discharging material in the desired direction, and at the desired elevation.

Furthermore the invention has for its object to provide a portable elevator adapted to deliver the material into a car either at the front, center or side thereof, and capable, when delivering the material into a car at the rear end thereof, of enabling the track, on which the elevator travels, to be used by the cars to be loaded.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a side elevation of a portable or traveling elevator, constructed in accordance with this invention. Fig. 2 is a front elevation. Fig. 3 is a plan view of the car, partly in section. Figs. 4 and 5 are detail views, illustrating the construction of the adjustable discharge spout or chute. Fig. 6 is a detail view, illustrating the arrangement of the clutch operating member. Figs. 7 and 8 are detail perspective views, illustrating the manner of mounting the vertical pivot of the elbow of the chute.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a main or car frame; composed of intermediate and side longitudinal beams and transverse

connecting bars or beams, and mounted upon front and rear car trucks 2 and 3, which may be of any desired construction, and which may be provided with any desired number of axles and wheels, although in the accompanying drawings four-wheeled trucks are illustrated. In practice the front truck 2 is spaced a sufficient distance from the front end of the machine to enable sections of track to be laid in front of the machine for advancing the latter as the material is elevated. The longitudinal beams of the main or car frame are curved upwardly at their front ends 4, and an upwardly and inwardly inclined conveyer frame 5 is mounted on the front end of the main or car frame.

The conveyer frame, which may be of any desired construction, is provided at opposite sides with crossed inclined braces 6, and is rigidly secured at its lower end to the main or car frame, when it is in operative position, and in order to enable it to be lowered and folded for transportation, it is detachably secured by bolts, or other suitable fastening devices to the upwardly curved ends 4 of the beams of the main frame, and it is hingedly connected at its inner or rear side. The conveyer frame is provided at opposite sides of the main frame and also at opposite sides of the center thereof with brackets or plates 6<sup>a</sup>, provided with eyes, which register with eyes of corresponding brackets or plates 1<sup>a</sup> of the main or car frame. The eyes of the brackets or plates 1<sup>a</sup> and 6<sup>a</sup> receive a continuous pintle rod 2<sup>a</sup>, which extends entirely across the machine. The hinged connection between the conveyer frame and the main or car frame permits the conveyer frame to swing downward upon the main or car frame, when the bolts or other fastening devices of its front or outer portion are removed, and when the braces 8 and the adjustable swinging chute and its supporting pivot, hereinafter described, are detached. The short lower shafts and the sprocket wheels thereof are also removed when the conveyer frame is to be lowered upon the main or car frame. The conveyer frame is adapted to be lowered upon the machinery hereinafter described, which does not have to be detached. The conveyer frame, which is provided at the top portion with opposite bearings 7, is also supported by inclined bracing bars or members 8, secured at their lower ends to the main or car frame at opposite sides thereof by bolts, or other suitable fastening devices and inclined upwardly and forwardly and provided at their upper terminals with angularly disposed portions 9, which fit against the adjacent inclined portions of the conveyer frame and are suitably secured to the same. By this construction the conveyer frame is rigidly supported in an inclined position over the car. The conveyer frame may be constructed of any desired height to adapt the machine for the character of work to be performed.



The bearings 7 receive an upper shaft 10, which extends entirely across the conveyer frame and which receives upper sprocket wheels 11 of a plurality of endless conveyers. The endless conveyers, which may be of any desired number, are located at opposite sides of the top and at the center of the space between the rails. The side conveyers are located above the rails and project beyond the same. In the accompanying drawings three are shown, one being located at the center of the front end of the car, and the other two being arranged at opposite sides of the central conveyer. The conveyers are provided with approximately triangular buckets 12, suitably secured to endless sprocket chains 13, which are arranged in pairs and which extend downwardly and forwardly from the upper sprocket wheels 11 to lower sprocket wheels 14. Each endless conveyer is provided at its lower end with an independent or separate shaft 15, journaled in adjustable bearings 16 to enable the slack in the chain of any one of the conveyers to be readily taken up. The adjustable bearings 16 are slidable in oblong frames or pedestals 17, which are arranged at an inclination and which extend a sufficient distance below the front of the main or car frame to enable the endless conveyers, when operating on a loose bank of material, to clear a space in advance of the front truck, of sufficient depth to receive the cross-ties and rails for extending the track in advance of the machine.

In practice the track will be laid in four or five foot sections, and there will be sufficient space between the front wheels and the elevators to permit a section of track to be placed in position for extending the track already laid. The central conveyer, which is arranged between the rails, and the side conveyers, which project laterally beyond the rails, are adapted to not only load the material upon the car, but they also clear a space sufficiently large for the machine to follow up its work without hand shifting.

When moving the machine from one place to another, the bottom buckets may be taken off. The bearings 16 are adjusted by means of screws 18, arranged at the upper ends of the guides and provided at their upper ends with hand wheels 19, or other suitable means for rotating them.

The lower portions of the endless conveyers extend downward from the front end of the car, and are adapted to engage any loose material in bulk, such as stored coal, loose earth, or the like, and the buckets are adapted to carry the material upwardly to an adjustable spout or chute. The buckets, in traveling over the upper end of the conveyer frame, are inverted to discharge their contents into a hopper shaped upper section 20 of the spout or chute.

The hopper shaped upper section 20, which tapers downwardly, is set at an inclination and is secured at its upper end to the conveyer frame. The upper end of the section 20 is provided with opposite laterally extending attachment flanges 21, which are bolted to the adjacent portions of the conveyer frame. The lower end of the upper section 20 is provided with a depending cylindrical neck 22, which fits in a rotary elbow 23, having a vertical upper portion and an inclined lower portion. The upper vertical portion receives the depending neck 22 of the hopper shaped section 20, and the neck and elbow are provided with collars 24 and

25, arranged exteriorly of the said parts and provided with horizontal annular flanges, which fit against each other, whereby the elbow is capable of free rotary movement on the neck.

The elbow is supported by a vertical pivot, which has a round upper end 27 to fit in a depending socket 28 of the elbow. The depending socket 28, which is arranged vertically, as clearly illustrated in Fig. 4 of the drawings, is provided with an inclined attachment plate or portion, which is bolted or otherwise secured to the elbow. The upper end 27 is solid, but the rest of the vertical pivot 26 is preferably tubular, and is provided with a threaded lower end 29, which is screwed into a threaded socket 30 of the car frame. The threaded socket may be mounted on the car frame in any desired manner, and the vertical pivot is supported at an intermediate point by braces 31 and 32, having diverging arms or portions, which are secured to the inclined bars or members 8. The braces 31 and 32 are provided at their apexes with eyes 33 through which the vertical pivot passes.

The lower inclined portion of the elbow is provided with a depending eye 34, which receives a pivot or pintle 35, and the latter hinges a lower adjustable section 36 to the elbow. The lower adjustable section 36 of the spout or chute is arranged at an inclination and is provided with a flared upper end 37 to receive the lower end of the elbow, and it is provided at the bottom of the flared portion with a slot to receive the projecting eye 34, and it has eyes 38 at opposite sides of the slot for the reception of the pivot or pintle. The lower inclined section 36 of the spout is adapted to swing upwardly and downwardly, and is adjustably supported by means of a brace, composed of upper and lower rods 39 and 40 and a connecting turn buckle 41. The upper rod 39 is provided at its upper end with an eye 42, which is linked into a swiveled eye 43, whereby the brace is adapted to swing freely, when the elbow and the lower section 36 are moved horizontally. The swiveled eye 43 is provided with a pivot 44, which is arranged in a perforation or bearing opening of a substantially U-shaped bracket or member 45. The substantially U-shaped bracket or member 45 is mounted on the upper hopper shaped section 20 of the spout or chute, and it has terminal projecting portions secured to the same. The lower end of the lower rod 40 is provided with an eye 46, which is linked into an eye 47 of the bottom section 36 of the spout or chute. The inclined lower section is adapted to swing horizontally to extend it in any direction, and it is also adapted to be readily raised and lowered by means of the adjustable brace 41. The lower section 36 may be made of any desired length, and the conveyer is adapted to deliver the material into a car at the center or either end thereof, and when filling a car at the rear end thereof, the track on which the machine travels may be utilized for running the cars to be filled to and from the machine.

The machine may be propelled forwardly or backwardly and the conveyers operated by any suitable motor, which is designed to be coupled to a transverse crank shaft 48, and the latter carries a sprocket pinion 49, which is connected by a sprocket chain 50 with a large sprocket wheel 51 of a counter-shaft 52. The gears may be of any relative size to secure the desired power and speed. The counter-shaft 52 is provided with



a spur pinion 53, which meshes with a large spur gear 54 of a main transverse shaft 55, from which motion is communicated either to the car or to the endless conveyers.

Mounted on the transverse shaft is a slidable clutch section 56, having opposite clutch faces 57 and 58, which are adapted to engage corresponding clutch sections 59 and 60 of the sprocket pinions or gears 61 and 62. The movable clutch section 56 is slidably interlocked with the shaft, and it may be engaged with either of the clutch sections 59 and 60, or may be arranged at an intermediate point, as illustrated in Fig. 3 of the drawings. The clutch sections, as clearly illustrated in Fig. 3 of the drawings, are provided with projections and recesses to enable the sections to interlock when engaged with each other, but any other form of clutch may be employed, if desired. The clutch is operated by means of a shifting lever 63, mounted on a longitudinal rock shaft 64, which is provided at its front end with a pair of upwardly extending arms 65, located at opposite sides of the slidable clutch section, as clearly shown in Fig. 6 of the drawings. The shifting lever 63 carries a spring actuated detent or dog 67, arranged to engage a notched segment 68, and adapted to be operated by a latch lever 69, mounted on the shifting lever adjacent to the upper end thereof. The notched segment 68, which is suitably fixed to the main or car frame, is provided with central and side notches, for holding the slidable clutch section in engagement with either of the other clutch sections, or for maintaining the slidable clutch sections out of engagement with both of the other clutch sections, as clearly shown in Fig. 3 of the drawings, whereby the motor may operate without actuating either the car or the conveyers.

The main transverse shaft is connected with the rear axle 70 of the front truck by means of sprocket gearing, consisting of sprocket wheels 71 and 62, mounted respectively on the axle 70 and on the main transverse shaft and receiving a sprocket chain 73. The front axle 74 of the rear truck is positively driven by a sprocket gearing connecting the front axle of the rear truck to the rear axle of the front truck, and consisting of sprocket wheels 75 and 76, and a sprocket chain 77.

The main transverse shaft is connected with the upper shaft of the series of the endless conveyers by means of sprocket gearing, consisting of an upper sprocket wheel 78, the lower sprocket gear 61 and a sprocket chain 79. This gearing is located at one side of the machine, as clearly illustrated in Fig. 2 of the drawings, and is set in motion when the slidable clutch section is in engagement with the clutch section 59 of the sprocket gear 61.

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

1. A machine of the class described comprising a wheeled frame, an inclined conveyer frame rigidly mounted on the conveyer frame at one end thereof and extending upwardly and inwardly, a plurality of endless conveyers, a continuous shaft mounted on the conveyer frame at the upper portion thereof and receiving the said conveyers, and separate independently adjustable lower shafts mounted on the conveyer frame and receiving the said conveyers.

2. A machine of the class described comprising a main frame, a conveyer frame mounted on the main frame, a continuous shaft journaled on the conveyer frame at one end

thereof, separate independently adjustable shafts journaled on the conveyer frame at the opposite end thereof, and a plurality of endless conveyers mounted on the said shafts.

3. In a machine of the class described, the combination with a track, of a wheeled frame adapted to run on the track, a plurality of endless conveyers consisting of a central conveyer located in the space between the rails of the track, and side conveyers operating above the rails, and means for operating the conveyers.

4. In a machine of the class described, the combination with a track of a wheeled frame designed to run on the track, a plurality of endless conveyers, the side conveyers of which are arranged to operate above the rails of the track, and means for operating the conveyers.

5. A machine of the class described comprising an inclined conveyer frame, a plurality of conveyers, an inclined downwardly tapered chute fixed at the top to the conveyer frame and having a neck at the bottom, a rotary elbow connected with the neck, and an adjustable section hinged to the elbow and arranged to swing vertically.

6. A machine of the class described comprising a conveyer, a chute fixed to the conveyer, a rotary section connected with the chute, an adjustable section pivoted to the rotary section and arranged to swing vertically, and an adjustable brace located above the adjustable section and connected with the same and with the chute.

7. A machine of the class described comprising a main frame, a conveyer having an inclined conveyer frame, braces mounted on the main frame and connected with the conveyer frame, a chute having an adjustable section arranged to rotate horizontally, a vertical pivot mounted on the main frame and supporting the adjustable section of the chute, and braces secured to the said braces and provided with eyes receiving the vertical pivot.

8. A machine of the class described comprising a conveyer, a chute having a fixed section and provided with an adjustable section arranged to swing vertically and horizontally, an adjustable brace connected with the adjustable section and provided with a pivot, and a bracket mounted on the fixed section and receiving a pivot of the adjustable brace.

9. A machine of the class described comprising a conveyer, a chute having a fixed section and provided with an adjustable section arranged to swing vertically and horizontally, an arched bracket mounted on the fixed section and projecting therefrom, and a brace connected with the adjustable section and having a pivot mounted on the arched bracket.

10. A machine of the class described comprising a conveyer having a frame, a chute composed of a hopper shaped section secured to the conveyer frame and having a neck, a pivotally mounted elbow connected with the neck, a bottom section hinged to the elbow, and adjustable means secured to the bottom section and pivotally connected with the hopper shaped section.

11. In a machine of the class described, the combination with a track, of a wheeled frame adapted to run on the track, a plurality of endless conveyers consisting of a central conveyer located in the space between the rails of the track, and side conveyers operating above the rails and extending laterally beyond the same, and means for operating the conveyers.

12. In a machine of the class described, the combination of a frame, car trucks supporting the frame and provided with wheels constructed to run on a track, a plurality of endless conveyers carried by the frame and consisting of a central conveyer located in advance of the space between the wheels of the trucks, and side conveyers operating in advance of the said wheels, and means for operating the conveyer.

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

JOHN BEACH.

Witnesses:

CHAS. H. CRELLIN,  
GEORGE F. BURKHARDT.