P. L. WOOSTER.

PORTABLE CONVEYER.

APPLICATION FILED OCT. 3, 1908.

1,005,398.

Patented Oct. 10, 1911.

5 SHEETS—SHEET 1.

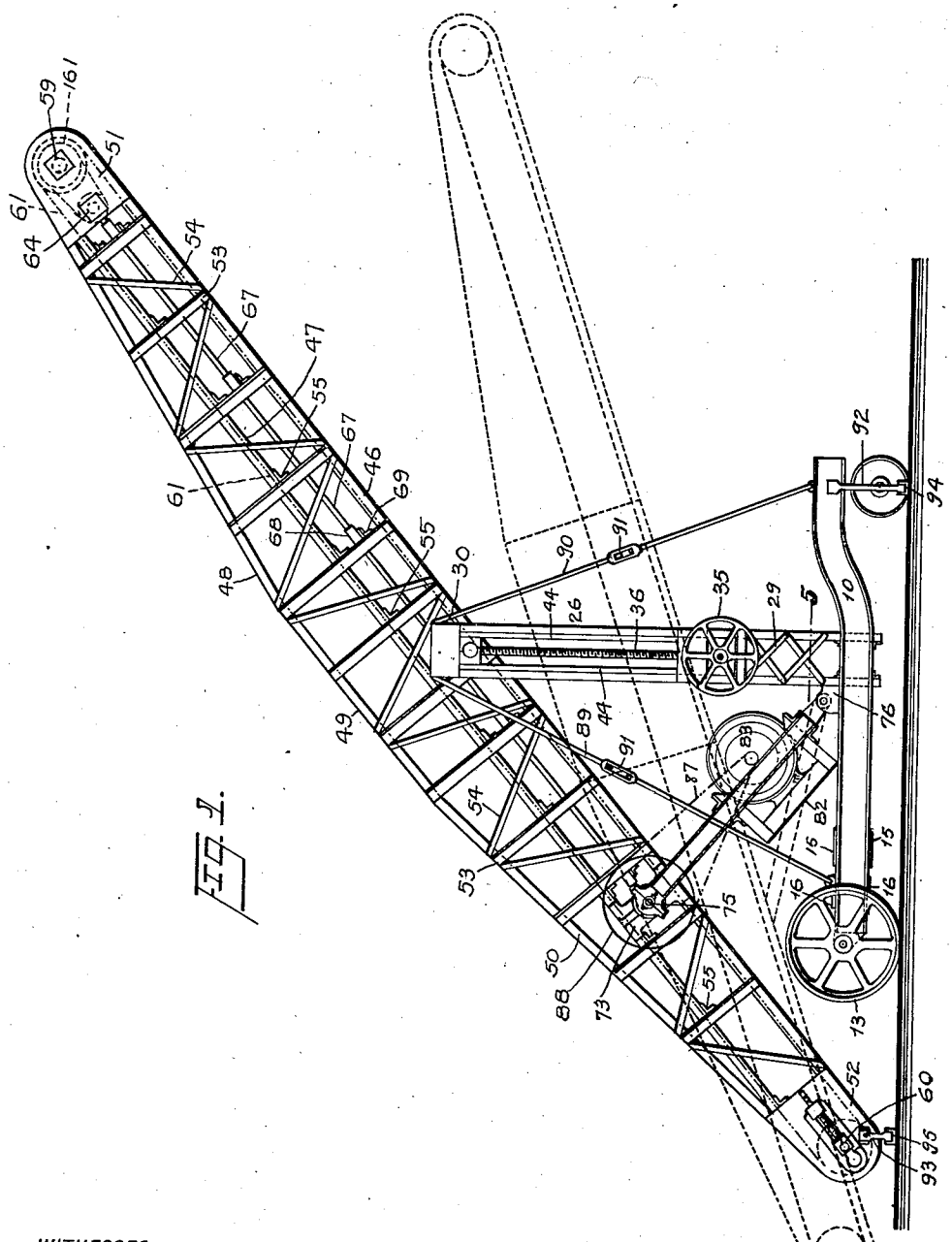

FIG. 1.

WITNESSES

Frederick Germann Jr.

Ethel B. Reed

INVENTOR

Philip L. Wooster,

BY

Russell M. Everett

ATTORNEY.

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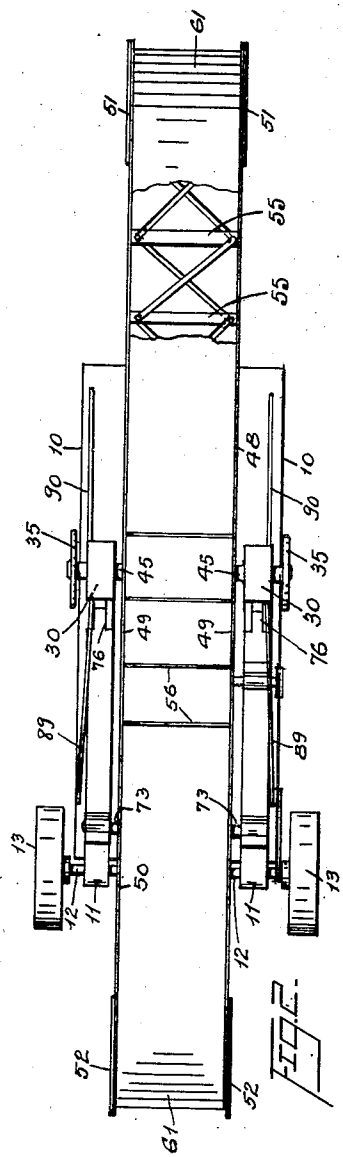

FIG. 2.

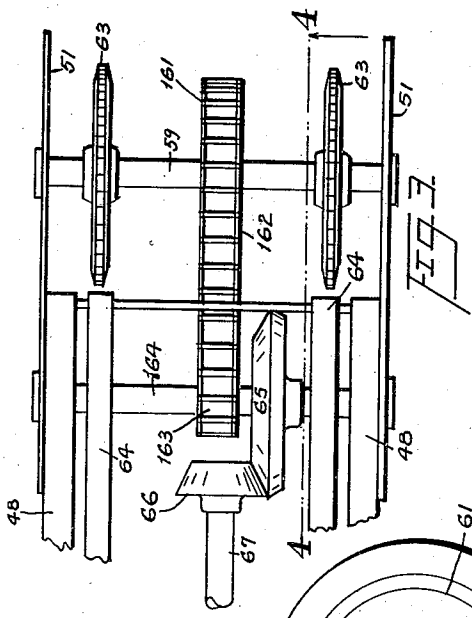

FIG. 3.

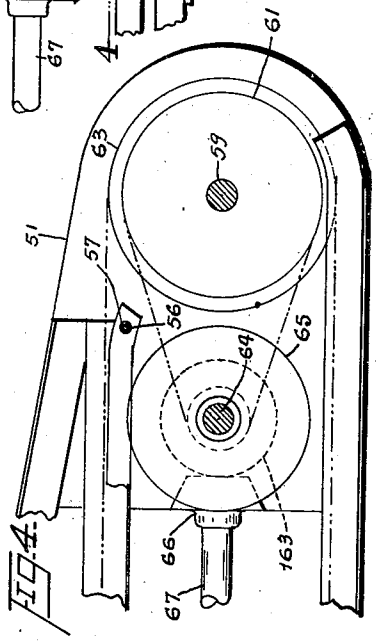

FIG. 4.

WITNESSES

Frederick Germann Jr.

Ethel B. Reed

INVENTOR

Philip L. Wooster,

BY

Russell M. Everett.

ATTORNEY.

P. L. WOOSTER.

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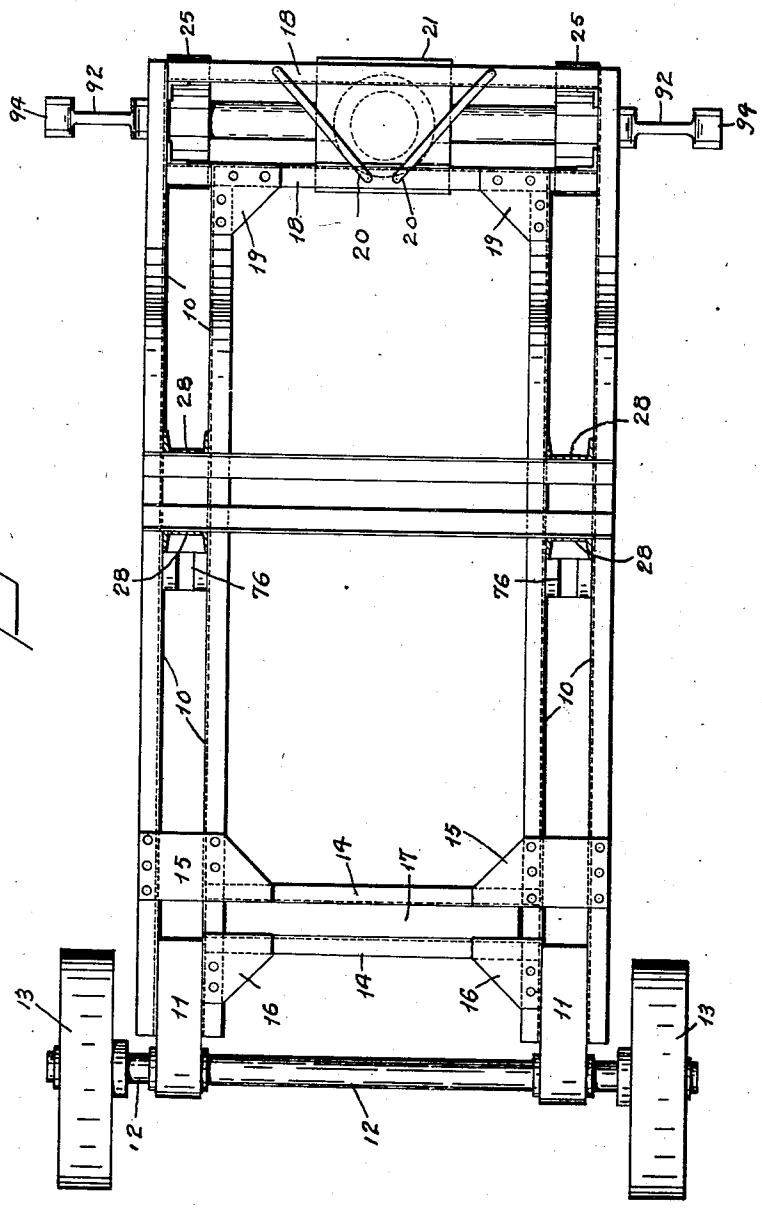

FIG. 5.

WITNESSES

Frederick Gemaunder.

Ethel B. Reed

INVENTOR

Philip L. Wooster,

BY

Russell M. Everett

ATTORNEY.

P. L. WOOSTER.

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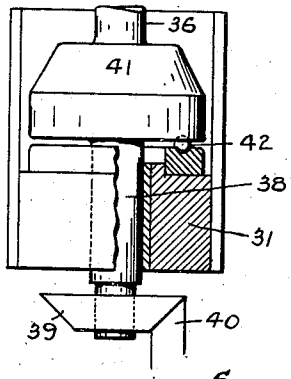
5 SHEETS—SHEET 4.

FIG. 8.



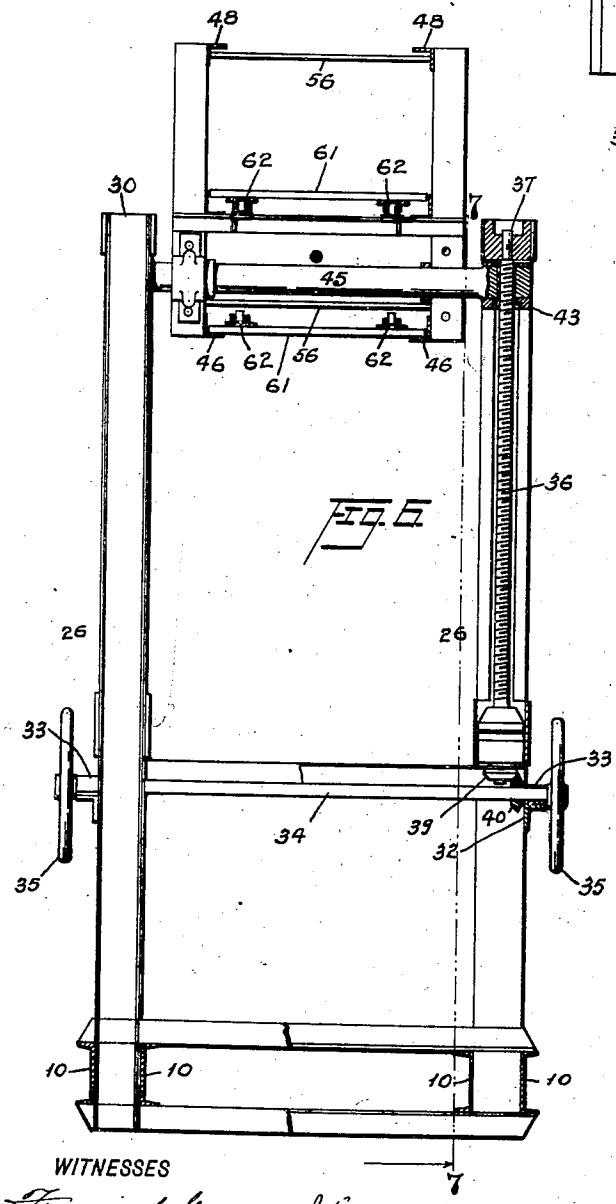


FIG. 6.

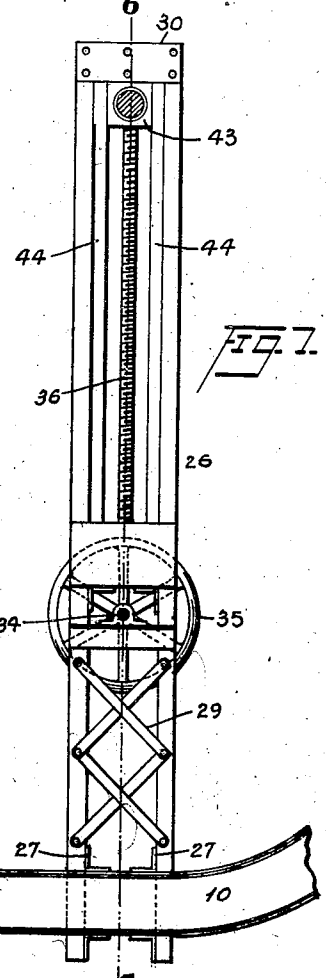


FIG. 7.

WITNESSES

Frederick Germann Jr.

Ethel B. Reed

INVENTOR

Philip L. Wooster.

BY

Russell M. Everett

ATTORNEY.

P. L. WOOSTER.

PORTABLE CONVEYER.

APPLICATION FILED OCT. 3, 1908.

1,005,398. **Patented Oct. 10, 1911.**

5 SHEETS—SHEET 5.

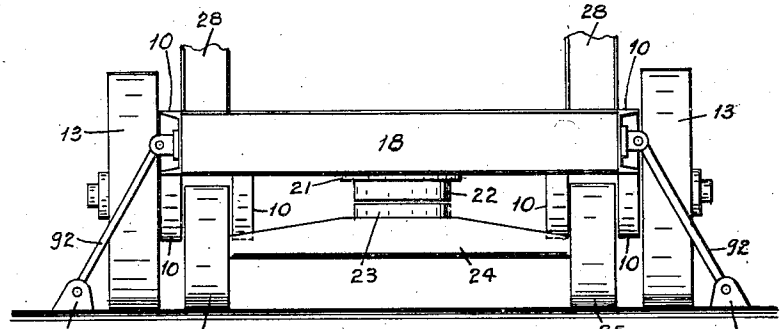


FIG. 11.

FIG. 9.

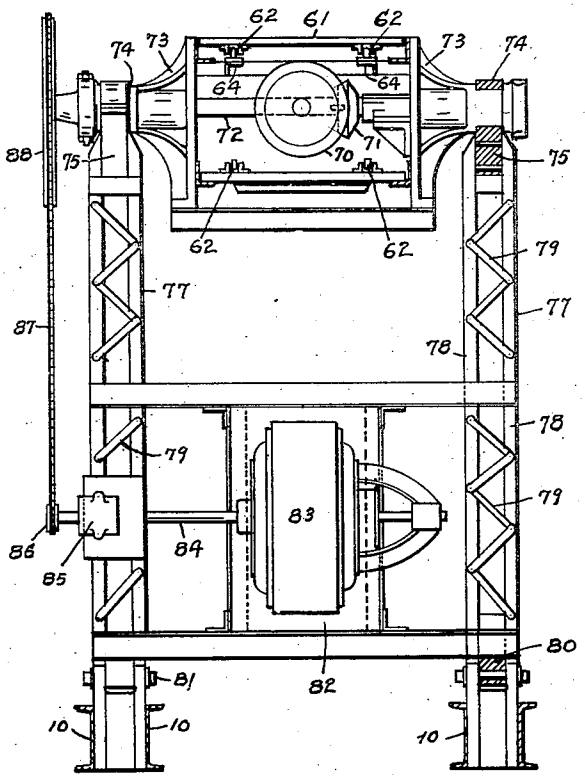
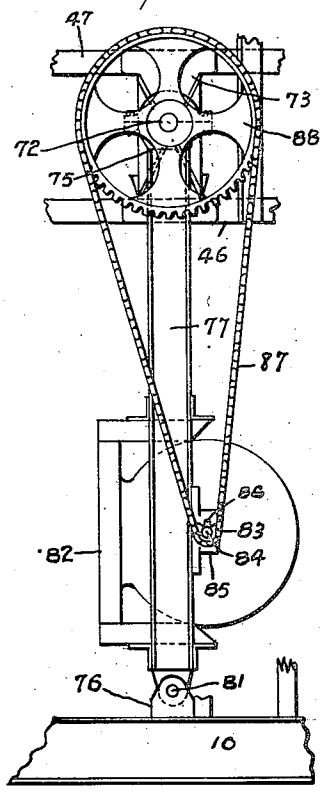


FIG. 10.



WITNESSES

Frederick Germaun Jr.

Ethel B. Reed

INVENTOR

Philip L. Wooster,

BY

Russell M. Everett,

ATTORNEY.

UNITED STATES PATENT OFFICE.

PHILIP L. WOOSTER, OF YONKERS, NEW YORK, ASSIGNOR OF ONE-FOURTH TO DURYEA MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY, AND THREE-EIGHTHS TO BENJAMIN L. DURYEA, OF JERSEY CITY, NEW JERSEY.

PORTABLE CONVEYER.

1,005,398. Specification of Letters Patent. Patented Oct. 10, 1911.

Application filed October 3, 1908. Serial No. 455,960.

To all whom it may concern:

Be it known that I, PHILIP L. WOOSTER, a citizen of the United States, residing at Yonkers, in the State of New York, have invented certain Improvements in Portable Conveyers, of which the following is a specification.

This invention relates to that class of portable conveyers which are adapted to be employed upon wharves and docks or in warehouses for loading and unloading, stacking or otherwise handling merchandise of all sorts as it is shipped, and the device having an endless conveyer belt which can be brought into different positions required for its use.

The objects of the invention are to secure a portable conveyer in which a conveying belt and its frame is supported entirely by the body portion of the conveyer, and does not require other support at its upper end; to thus avoid the necessity for resting the upper end of the conveyer upon the deck of a ship or some such support or suspending it by tackle; to mount the conveyer belt and its frame upon a body portion which is movable upon the floor or ground and will hold the said frame and conveyer belt at various angles; to enable the angular position of said frame and conveyer belt to be conveniently adjusted; to secure driving means for said conveyer belt which shall not be disturbed by the adjustment of the said frame of the conveyer belt; to secure a strong, simple and durable construction, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts in the several figures, Figure 1 is a side elevation of a portable conveyer of my improved construction, showing in dotted lines a second position of the conveyer belt and its frame; Fig. 2 is a plan of the invention; Fig. 3 is a detail plan of the connection of the driving mechanism to the conveying belt, and Fig. 4 is a sectional view of the same on line 4, 4 Fig. 3, looking in the direction indicated by the arrow; Fig. 5 is a plan of the body portion of the conveyer, on a larger scale, the conveying belt and its frame, as well as the motor and its support, being removed, and the standards for the conveying belt frame being cut away on line 5, Fig. 1; Fig. 6 is a front elevation of certain upright standards belt and its frame, the said frame being shown in cross section and the right hand standard in central vertical section as on line 6, 6 Fig. 7; Fig. 7 is a view on line 7, 7 of Fig. 6, looking in the direction indicated by the arrow; Fig. 8 is a detail view of the ball-bearing for one of the adjusting screw-shafts in said supporting standards; Fig. 9 is a front elevation of the motor-supporting frame showing the conveying belt frame in cross section and illustrating the means for transmitting power to said conveying belt; Fig. 10 is a side elevation of the said motor-supporting frame and connections, and Fig. 11 is a front elevation of the body portion of the conveyer.

In said drawings, the body portion of my improved portable conveyer is shown comprising parallel pairs of heavy channel bars 10, 10 placed back to back at a distance apart and the two pairs being located at opposite sides of the machine. At the rear end of the body portion the channel bars 10, 10 of each pair receive between themselves a block 11, and in the projecting ends of said blocks is journaled an axle 12 which carries at its ends outside the body portion traction wheels 13, 13. Adjacent to the rear end of the body portion, the pairs of channels 10 are properly spaced by means of transverse channel beams 14, 14, properly connected to said pairs of channels and braced with respect thereto by means of plates 15 and 16. A weight 17 is furthermore located between the said transverse channels 14, 14, to assist in counterbalancing the weight of the load and forward end of the conveyer belt frame, as hereinafter described. At the forward end of the said body portion, referring more particularly to Figs. 5 and 11 of the drawings, the outer channels of the two opposite pairs are longer than the inner ones, and are connected by transverse channel beams 18, 18, the forward one of which is substantially flush with the ends of the longer longitudinal channels, while the rear one lies against the extremities of the shorter longitudinal channels and is connected and

braced thereto by plates 19. Straps 20, 20 brace the forward transverse channel 18 with respect to the rear one at their upper edges, and at their lower edges, intermediate of their ends, is a plate 21 having a downwardly facing bearing 22 adapted to rest upon a coöperating bearing 23 of an axle 24. Said axle has traction wheels 25, 25 at its opposite ends, and it will be understood that a king-bolt connects the two members 22, 23 so that the lower one can rotate and thus the axle 24 be turned to steer the whole body portion, as is common in vehicles.

Between the front and rear wheels of the body portion just described, standards 26 project upward at opposite sides of the body portion, each standard being arranged between the channel beams 10, 10 of a pair, and securely fastened and braced thereto by means of transverse angle-bars 27. Each of these upright standards 26 comprises a pair of channel beams 28, 28 arranged back to back at a distance apart and edgewise between the channels 10, 10. The lower ends of said channels 28, 28 have braces 29 between them and the tops of said channels are connected by a block 30. Near the lower part of each upright standard a block 31 (see Fig. 8) is fixed between the two channels, and lower down angle bars 32 or the like extending between the channels support bearings 33 for a transverse shaft 34 which extends clear across the frame formed by the two standards in the plane thereof, and outside each edge of said frame is provided with a hand-wheel 35 for turning said shaft. Between the upper and lower blocks, 30 and 31, of each standard extends a screw-shaft 36 having top and bottom bearings 37, 38, in said block, and projecting at its lower end through the lower block 31 to carry a bevel gear 39 adapted to engage another bevel gear 40 on the transverse shaft 34. By turning the said shaft 34, therefore, the two screw-shafts 36, 36 in the two upright standards at the opposite sides of the body portion can be rotated in unison. Each screw-shaft 36 furthermore has near its lower end a fixed cone 41 between which and the lower block 31 are ball bearings 42 to support the said shaft 36 and the parts carried thereby. (See Fig. 8). Upon the said screw-shafts 36 are correspondingly threaded bearing blocks 43, 43, each of which is adapted to slide vertically of its upright standards between slideways 44, 44 on the opposite channel beams 28, 28 thereof, as the screw-shafts are rotated. In these bearing blocks 43, 43 are mounted the ends of a transverse shaft 45, and upon this shaft the frame for the conveyer belt is supported, such support being pivotal so that the frame can tilt or swing into different angular relations to the horizontal, as indicated in Fig. 1. The said frame is in general construction similar to the one described in my copending application Serial Number 453,257, filed September 16, 1908, comprising an elongated trussed construction of lower parallel side bars 46 of angle iron which are preferably straight, other intermediate angle bars 47 parallel to said lower bars 46, and upper angle bars 48. These upper angle bars 48 have a straight middle portion 49 spaced at considerable distance from intermediate bars 47, and are inclined for their end portions 50 to rest upon said intermediate bars 47 at their extremities, and thus afford a strengthening truss. The extremities of all said side bars 46, 47, and 48 in the same vertical plane, are connected by vertical end plates 51 and 52 at the sides of the frame; furthermore said side bars in the same vertical plane are connected by means of transverse struts 53 and inclined braces 54, which are also preferably of angle iron and bolted to the bars, or riveted in place.

The two side portions of the frame are held in relative parallel relation by means of angle bears 55 secured beneath the intermediate longitudinal bars 47 in the corners formed thereby with the transverse struts 53, and also by tubular separators or pieces of pipe 56 slipped upon tie-rods 57 extending between the lower bars 46 and also between the highest parts 49 of the upper bars 48, if desired. The end plates 51, or 52, at each end of the frame are also connected by similar tie-rods 58 with tubular separators thereon, and between the end plates of each pair extends a shaft 59, or 60, upon which are sprocket wheels to receive the conveyer belt 61. This conveyer belt comprises a series of transverse slats connected near their opposite ends by endless chains 62, 62 which run over the said sprocket wheels 63. These chains are preferably provided at the pivotal connections of their links with rollers, which for the upper portion of the conveyer belt or portion carrying the load, run upon tracks 64 extending from end to end of the conveyer frame in the planes of the sprocket wheels and supported upon the cross bars 55.

Both the lower angle bars 46 and the intermediate ones 47 are arranged with one flange extending vertically upward and the other projecting horizontally inward, as shown. Thus as the conveyer belt 61 travels, its upper portion lies above the horizontal flange of the intermediate angle-bars 47 and its slats lie endwise between the upwardly extending flanges, whereby the belt is held positively against any sidewise displacement. The under or returning portion of the conveyer belt also lies above the inwardly projecting flanges of the lower side bars 46, and is prevented thereby from unduly sagging.

Means are provided at one end of the

frame for adjusting the shaft 60 to tighten the conveyer belt, and at the other end of the frame, the upper end as shown in the drawings, are means for transmitting driving power to the sprocket wheel shaft 59. These means comprise a sprocket wheel 161 fast on said shaft and receiving a chain 162 which also passes over a driving sprocket 163 on an auxiliary shaft 164, also journaled transversely of the conveyer belt frame in the end plates 51. This auxiliary shaft 164 has a bevel gear 65 which meshes with a coöperating gear 66 on a driving shaft 67 which extends longitudinally of the conveyer belt frame to a lower point on the same, shown as about half way between the support of the frame upon the upright standards of the body portion and its lower end. This shaft 67 lies between the lower and intermediate bars 46 and 47 of the frame and is journaled in bearings 68 supported upon cross bars 69 between the transverse struts 53 of the frame. At its lower end the said driving shaft 67 has a bevel gear 70 which meshes with a pinion 71 upon a transverse shaft 72, said shaft being journaled in boxes 73, 73 bolted one to each of the outer sides of the conveyer belt frame, preferably to the lower and intermediate angle bars 46, 47 thereof. These boxes have at their outer ends trunnions 74 which are journaled in the end pieces 75 of a motor-supporting frame, which at its other end is hinged to the body portion of the conveyer at the bases of the upright standards before described and at the rear of the same, in bearings 76. This motor-supporting frame, which therefore stands in an oblique plane as shown in Fig. 1, comprises opposite arms 77, 77, each lying in the vertical plane of one of the side pieces of the body portion composed of the channel beams 10, 10. Each of the arms is shown as made up of parallel channels 78, 78, arranged back to back at a distance apart and being braced in that relation by braces 79. The end pieces 75 at the tops of the arms are inserted between the channels 78, 78, and similarly at the bottom ends of said arms end pieces 80 project from between the channels 78, 78, to enter the fixed hinged members 76 and receive the hinge pins 81. These fixed hinge members 76 are preferably inserted and rigidly held between the channel beams 10, 10 of the horizontal side pieces of the body portion of the conveyer.

Near the lower end of the motor-supporting frame is a platform 82, secured transversely of the arms 77 and between the same, and upon which platform is mounted the motor 83 which supplies power in my improved conveyer to drive the conveying belt, and is preferably an electric motor. The shaft 84 of this motor projects at one end clear outside of the motor-supporting frame, having a bearing 85 upon the arm 77 of said frame, and at its extremity has a sprocket wheel 86. A chain 87 from this sprocket 86 then drives a second sprocket 88 upon the projecting end of the shaft 72 before described as mounted transversely of the conveyer belt frame at the upper end of the motor-supporting frame.

By the construction of my improved conveyer, therefore, it will be noted that the same can be pushed or wheeled into any place where it is desired to use it, that the conveyer belt frame can then be adjusted to any angular position desired, its lower end being always held close to the ground or floor by the pivotally linking motor-supporting frame, and that the upper end of the conveyer belt frame requires no outside support at all. For greater stability, brace-rods 89 and 90 extend from the top of the upright standards downward to the front and rear ends of the body portion, respectively, being provided each with a turn-buckle 91 for tightening. Furthermore, lateral braces 92 and 93 are hinged to the sides of the forward end of the body portion and lower end of the conveyer frame, respectively, each carrying at its lower extremity a pivoted shoe 94, or 95, adapted to engage the ground or floor at a little distance out from the conveyer. These braces, which are illustrated more particularly in Figs. 1 and 11, can thus be let down to steady the entire apparatus when in use, or swung upward into idle position when the conveyer is to be moved from place to place.

In the operation of my improved conveyer, the entire machine is wheeled to the station where it is to work, and then the lateral braces 92 or 93 let down. The hand-wheels 35 are then operated to rotate the screw-shafts 36 and raise or lower the conveyer belt frame until its upper end is brought into the desired position. The motor 83 is then started, and power is transmitted through the shaft 84, sprocket 86, chain 87, sprocket 88, shaft 72, bevel gears 71 and 70, drive-shaft 67, extending longitudinally of the conveyer belt frame, bevel gears 66 and 65 at the upper end of the conveyer belt frame, shaft 64, sprocket 63 on said shaft, chain 62, sprockets 61, main end shaft 59, and sprockets thereon to drive the conveyer belt itself. Goods or articles put upon the lower end of the said conveyer belt will, therefore, be delivered in unceasing succession at the top end of the conveyer.

It will be understood that the motor supporting frame links the conveyer belt frame to the body portion of the conveyer in such a manner that the lower end of the conveyer belt frame is always at the ground or floor no matter what the angular position of said frame, and furthermore, said motor-supporting frame permits the uniform trans-

mission of power to the conveyer belt frame regardless of its changes in angular position.

A very important feature of my device is that of having the conveyer belt frame project so far at its forward or upper end beyond the body portion of the machine, since this enables the conveyer to deliver the articles being conveyed not only at the top of a pile, but furthermore at a considerable distance back from the front edge of a pile. Undue handling of the articles or dragging them a considerable distance after their deposit is thus avoided. This advantageous feature of the device is secured by my peculiar construction of the body portion, as well as its relation and connection to the conveyer belt frame.

Having thus described the invention, what I claim is:

1. In a portable conveyer, the combination with a body portion, of an elongated frame pivoted at a fixed point intermediate of its ends on said body portion, said ends projecting free and away from the body portion, means for raising and lowering the point of pivoting of said frame and holding it at different heights, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

2. In a portable conveyer, the combination with a body portion, of an elongated frame, a slide on said body portion pivotally supporting said frame at a fixed point intermediate of its ends, said ends projecting free and away from the body portion, means for adjusting said slide to different positions and holding it there, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

3. In a portable conveyer, the combination with a body portion, of an elongated frame, means pivotally supporting said frame at a fixed point intermediate of its ends on said body portion, means linking said frame to said body portion intermediate of said pivotal support of said frame and its lower end, the ends of the frame projecting free and away from the body portion, means for raising and lowering said pivotal supporting means, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

4. In a portable conveyer, the combination with a body portion, a horizontally disposed shaft upon said body portion, means for raising and lowering said shaft in a substantially vertical plane, an elongated frame journaled on said shaft intermediate of its ends and projecting at said ends free and away from the body portion, a conveyer belt arranged longitudinally of said frame, and means for driving said belt.

5. In a portable conveyer, the combination of a body portion, standards projecting upward from said body portion, a slide on said standards, a shaft on said slide, an elongated frame journaled intermediate of its ends on said shaft, said ends projecting free and away from the body portion, means for adjusting said slide and holding it at different heights, a conveyer belt arranged longitudinally of said frame, and means for driving said belt.

6. In a portable conveyer, the combination with a body portion, of fixed standards having slideways, boxes in said slideways, means for moving said boxes in said slideways and holding them in position therein, a shaft extending between said boxes, an elongated frame pivoted intermediate of its ends on said shaft, said ends being free to move toward and away from the body portion, a link pivotally connecting said frame to the body portion intermediate of said shaft and one end of the frame, a conveyer belt arranged longitudinally on said frame, and means for driving said belt.

7. In a portable conveyer, the combination with a body portion, of an elongated frame, means pivotally supporting said elongated frame on said body portion, means for adjusting said supporting means, means pivotally linking another point of said frame with the body portion, a conveyer belt arranged longitudinally of said frame, and a motor on said linking means for driving said belt.

8. In a portable conveyer, the combination with a body portion, of an elongated frame, means for pivotally supporting said frame on said body portion, means linking another point of said frame to the body portion, a conveyer belt arranged longitudinally of said frame, a motor supported by said linking means, a shaft concentric with the pivoting of said linking means to the frame, means for transmitting power from said motor to said shaft, and means for transmitting power from said shaft to said conveyer belt.

9. In a portable conveyer, the combination with a body portion, of an elongated frame, means pivotally supporting said frame on said body portion, a motor-supporting frame pivoted at one end to said body portion and at its other end to said frame between its point of pivoting to the body portion and its lower end, a motor mounted between the sides of said motor-supporting frame, a shaft extending transversely of the conveyer belt frame along the line of pivoting of the motor-supporting frame thereto, means for transmitting power from said motor to said shaft, and means for transmitting power from said shaft to said conveyer belt.

10. In a portable conveyer, the combination with a body portion, and an elongated frame, of a rigid support projecting from said body portion, means for pivotally

mounting said frame at a fixed point of its length on said support, a link pivoted to said body portion, means pivotally connecting said frame to said link, one of said pivotally mounting means and pivotally connecting means being adjustable toward and away from the body portion, a conveyer belt arranged longitudinally of said frame, and means for driving said belt.

11. In a portable conveyer, the combination with a body portion, of opposite standards fixed thereon and providing longitudinal slideways at their upper parts, screw-shafts in said slideways held against longitudinal movement, means for rotating said screw-shafts, sliding boxes in said slideways threaded to receive said shafts, an elongated frame, means pivotally supporting said frame intermediate of its ends on said sliding boxes, said ends being free to move toward and away from the body portion, a conveyer belt arranged longitudinally of said frame, and means for driving said belt.

12. In a portable conveyer, the combination with a body portion, of fixed standards having slideways, boxes in said slideways, means for moving said boxes in said slideways and holding them in position therein, an elongated frame, means for pivotally supporting said frame intermediate of its ends on said sliding boxes, the ends of said frame being free to move toward and away from the body portion, a conveyer belt arranged longitudinally of said frame, and means for driving said belt.

13. In a portable conveyer, the combination with a body portion, of fixed standards having slideways, boxes in said slideways, means for moving said boxes in said slideways and holding them in position therein, an elongated frame, means for pivotally supporting said frame on said sliding boxes, a link pivotally connecting said frame to said body portion, a conveyer belt arranged longitudinally of said frame, and means for driving said belt.

14. In a portable conveyer, the combination with a wheeled body portion, of upright standards on said body portion providing slideways, boxes in said slideways, means for sliding said boxes, a frame pivoted to said body portion at the base of said standards, a conveyer belt frame pivoted at different points of its length to said sliding boxes and to said frame, a conveyer belt arranged longitudinally of said conveyer belt frame, and means for driving said belt.

15. In a portable conveyer, the combination with a body portion, of standards on said body portion, an elongated frame pivoted to said standards, hollow trunnions on the opposite sides of said frame at a distance from said standards, a shaft journaled in said trunnions, a motor-supporting frame pivoted to the body portion and pivotally receiving said trunnions, a motor on said frame, means for transmitting power from said motor to said shaft, a conveyer belt arranged longitudinally of said elongated frame, and means for transmitting power from said shaft to said conveyer belt.

16. In a portable conveyer, the combination of an elongated frame, transverse shafts at the ends of said frame, sprocket-wheels on said shafts, a conveyer belt on said sprocket-wheels, an auxiliary shaft at one end of said frame parallel to the said sprocket-wheel shafts, means for transmitting motion between said shafts, a power-transmitting shaft extending longitudinally of the conveyer belt frame, bevel gears connecting said power-transmitting shaft to said auxiliary shaft, a transverse driving shaft on said frame, bevel gears transmitting motion from said driving shaft to said power transmitting shaft, and means for supplying power to said driving shaft.

17. In a portable conveyer, the combination with a wheeled body portion, of an elongated frame pivoted intermediate of its ends on said body portion, the ends of said frame being movable toward and away from the body portion, means for adjusting the point of pivoting of said frame in substantially vertical direction, means for holding the lower end of said frame always in a fixed horizontal plane, braces hinged to said body portion and to said lower end of the elongated frame to swing vertically into engagement with the ground, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

18. In a portable conveyer, the combination of a body portion, an elongated frame pivotally fixed on said body portion at substantially its center of gravity, the ends of the frame projecting free and away from the body portion, means for raising and lowering said point of pivoting of the frame, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

19. In a portable conveyer, the combination of a body portion, an elongated frame pivotally supported on said body portion at substantially its center of gravity, the ends of the frame being free to move toward and away from the body portion, means for raising and lowering said point of pivoting of the frame, a link pivotally connecting said frame to the body portion intermediate of said point of pivoting and one end of the frame and determining the path of movement of said end, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

20. In a portable conveyer, the combination of a body portion providing a substantially vertical slideway, a slide in said slideway, an elongated frame pivoted at sub-

stantially its center of gravity on said slide, the ends of the frame being free to move toward and away from the body portion, means for raising and lowering said slide, a link pivotally connecting said frame to the body portion intermediate of said slide and one end of the frame and determining the path of movement of said end, an endless conveyer belt arranged longitudinally of said frame, and means for driving said belt.

PHILIP L. WOOSTER.

In the presence of—
B. L. DURYEA,
RUSSELL M. EVERETT.