F. E. MOORE.

INCLINABLE ELEVATOR.

APPLICATION FILED OCT. 23, 1914.

1,162,382.

Patented Nov. 30, 1915.

3 SHEETS—SHEET 1.

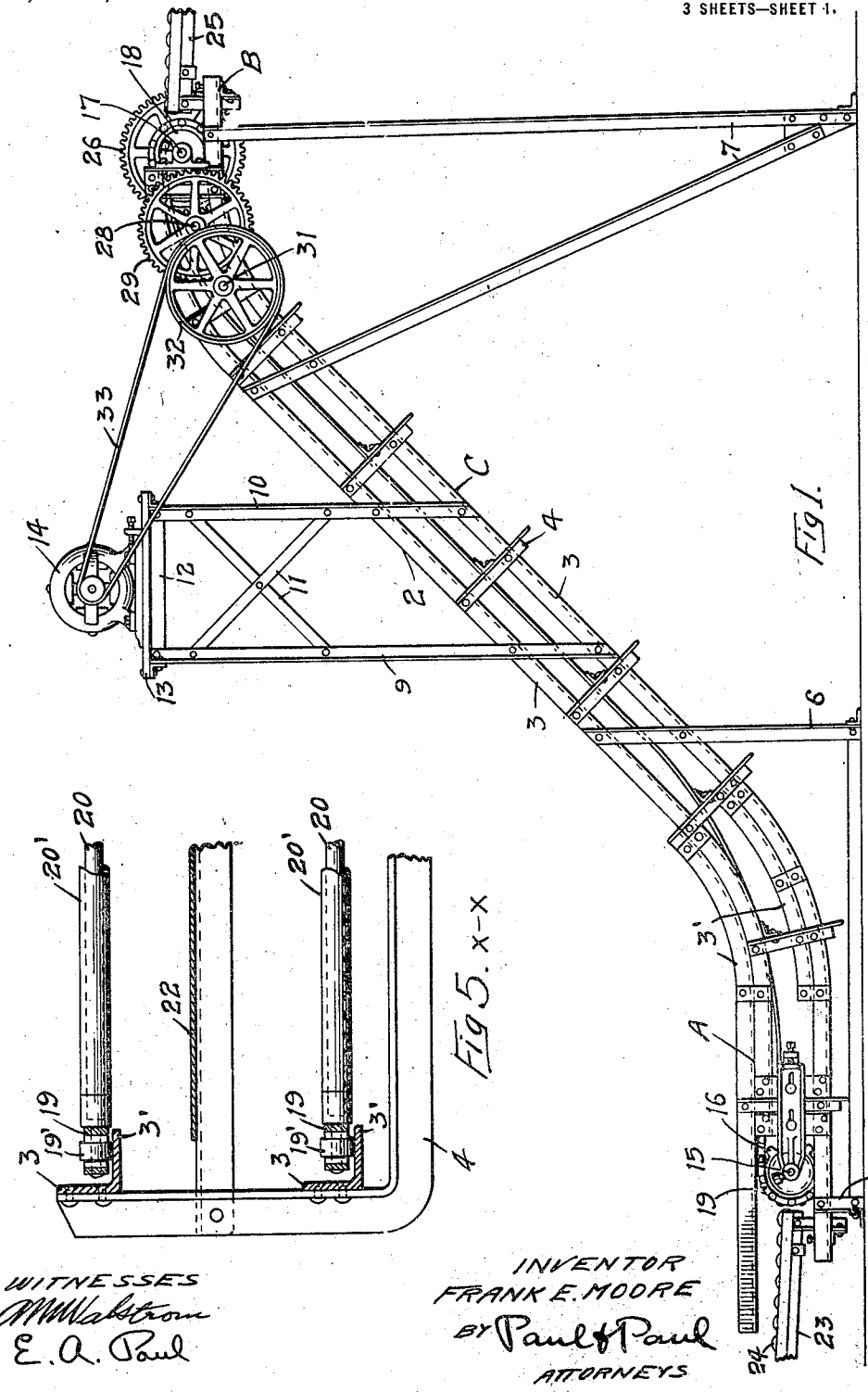


Fig. 1.

Fig. 5. x-x

WITNESSES

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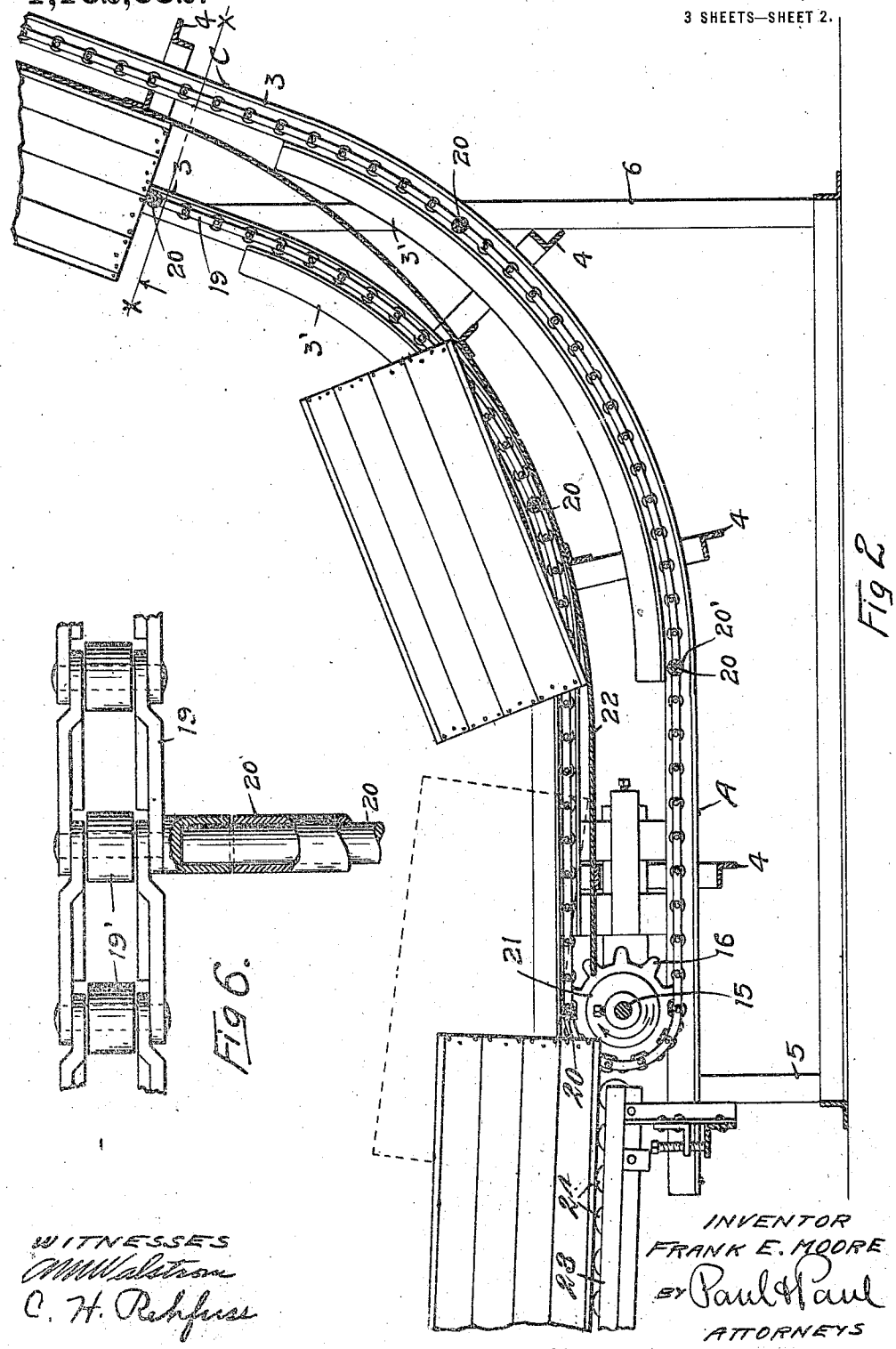


Fig 2

Fig 6.

WITNESSES

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3 SHEETS—SHEET 3.

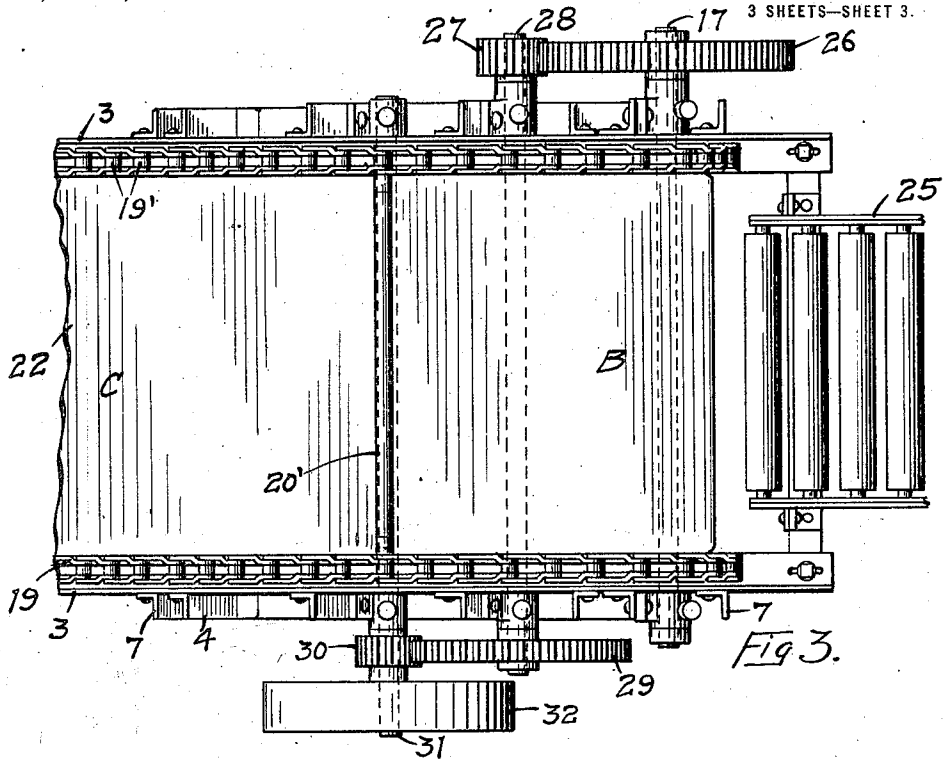


Fig 3.

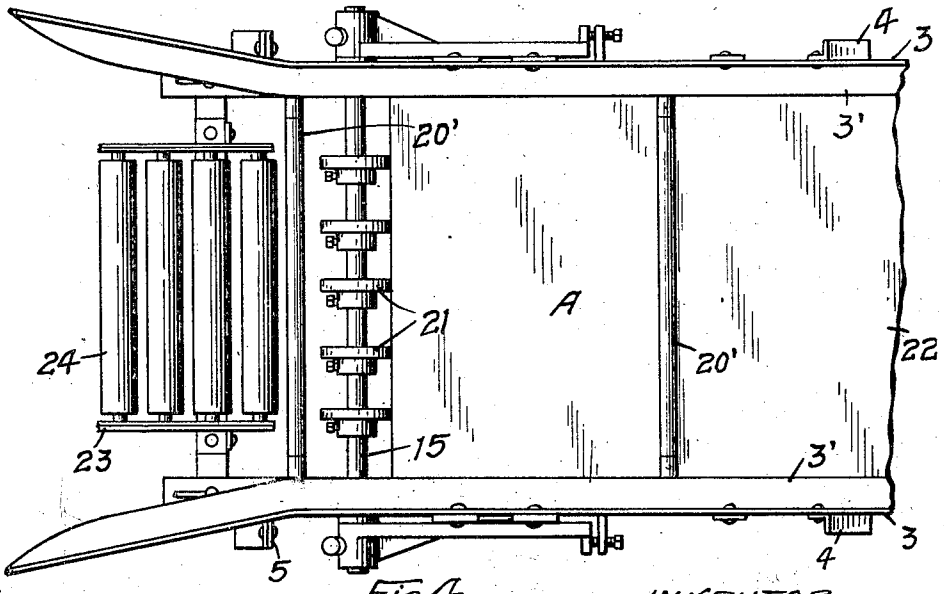


Fig 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

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INCLINABLE ELEVATOR.

1,162,382. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed October 23, 1914. Serial No. 868,163.

To all whom it may concern:

Be it known that I, FRANK E. MOORE, a citizen of the United States, resident of Ellwood City, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Inclinable Elevators, of which the following is a specification.

This invention relates to improvements in inclinable elevators upon which packages are automatically loaded from a gravity carrier, and transferred to a higher level where they are delivered to a suitable receiving device which may be another gravity carrier, a table, chute or any suitable device adapted to receive or hold the packages.

The invention consists generally in the constructions and combinations hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a side elevation of an elevator embodying my invention, Fig. 2 is a longitudinal section of the lower part of the elevator, Fig. 3 is a plan view of the upper portion of the elevator, Fig. 4 is a similar view of the lower portion thereof, Fig. 5 is a section on line X—X of Fig. 2, Fig. 6 is a detail view illustrating the manner of mounting the push bars on the endless chains.

In all of the drawings, 2 represents the frame of the elevator, which is preferably formed of steel angle bars 3, extending lengthwise of the elevator frame, and steel U-shaped bars 4 to which the longitudinal bars are connected. The longitudinal angle bars 3 and the transverse U-shaped bars 4, together with suitable legs or standards 5, 6 and 7, make up the frame 2. I also prefer to attach to the elevator an upright frame formed of suitable standards 9 and 10, provided with suitable brace bars 11 and horizontal top bars 12 upon which a platform 13 is mounted. A suitable driving motor 14 may be arranged upon the platform 13. The standards or upright bars 9 and 10 are preferably secured to the frame of the elevator in any suitable manner. I have here shown these uprights connected to the longitudinal bars 3 of the elevator frame.

The elevator has preferably a horizontal section A at the lower end thereof, a second horizontal section B at the upper end thereof and an inclined section C between the two horizontal sections, the horizontal and inclined sections merging into each other by a gradual bend or curve.

At the outer or receiving end of the lower horizontal section A, I mount in suitable bearings a shaft 15, provided with sprocket wheels 16. At the upper end of the elevator I mount a similar shaft 17 provided with sprocket wheels 18. Endless chains 19 pass around the sprockets at the upper and lower ends of the elevator. Said chains are provided at suitable intervals with the transverse push bars 20 (see Fig. 6). Each push bar 20 is preferably surrounded by a sleeve 20′ which turns freely on said bar. These chains and push bars form an endless carrier by which the boxes or packages are moved upward on the inclined elevator frame and delivered from the upper end thereof. Said chains and push bars, in their travel through the elevator, are preferably supported upon the horizontal plates or flanges 3′ of the longitudinal angle bars 3 (see Fig. 5). The chains are preferably provided with anti-friction wheels 19′ that rest upon said plates or flanges 3′. The shaft 15 is also preferably provided with a series of loading wheels 21. These wheels are preferably slightly smaller than the sprocket wheels 16 and they are arranged at suitable intervals on said shaft. A continuous drum may be employed instead of the wheels 21.

The elevator frame is provided with a floor 22 preferably formed of sheet metal and extending between the upper and lower reaches of the carrier belt, as shown in Figs. 1 and 2 of the drawings. At the lower end of the elevator, this floor is located nearer the upper bars 3, being about one-fourth of the distance between the flanges of the longitudinal angle bars 3 below the upper bar, as shown in Figs. 1 and 2 of the drawings. Throughout the straight inclined part of the frame said floor is located nearly midway between the flanges of the upper and lower longitudinal bars 3. Through the bend or lower curved portion of the elevator frame, the floor 22 is raised and occupies a position substantially on a level with the edge of the upper longitudinal bars 3. The result of this arrangement of the floor is to bring the push bars 20 in the lower

horizontal part of the elevator at a distance above the floor 22 equal to about one-fourth the distance between the edges of the upper and lower bars 3. In the straight inclined length of the elevator frame the floor is slightly nearer the lower longitudinal bars. Throughout the bend or lower curved portion of the elevator frame the floor is practically on a level with the flanges of the upper bars 3, so that said push bars are quite close to said floor. This construction and arrangement of the floor, and its location in respect to the flanges of the upper angle bars 3, upon which the push bars 20 rest constitutes the principal feature of my present invention.

At the intake or receiving end of the elevator I prefer to provide a suitable inclined gravity carrier 23. This carrier is provided with suitable antifriction rolls or wheels 24, which are preferably located with their upper surfaces slightly above the top of the shaft 15, but below the top of the rolls 21. At the upper or discharge end of the elevator I prefer to provide a suitable gravity carrier 25 onto which the boxes or packages from the elevator are discharged.

For driving the endless carrier of the elevator the shaft 17 is preferably provided with a suitable gear 26. This is driven by a pinion 27 from a shaft 28. The shaft 28 is provided with a gear 29 which is engaged by a pinion 30 on a shaft 31 The shaft 31 has a pulley 32 and is driven by a belt 33 from the motor 14. I find this a convenient arrangement of motor and gearing but it is obvious that the endless carrier may be driven by any other suitable means.

Power being applied through the motor the endless chain carrier, having the push bars 20, is driven with the upper reach of said carrier passing upward with the antifriction wheels 19′ riding upon the upper flanges 3′ of the upper angle bars 3. Said push bars move upward over the horizontal flanges 3′ of said angle bars and engage and push boxes or packages resting upon the floor 22 and fed to the elevator by the gravity carrier 23. It is important that each box or package passing upward over the inclined part of the elevator shall have its rear end directly and firmly engaged by one of the push bars. As the boxes or packages are fed forward by the gravity carrier 23, the ends of the boxes or packages come in contact with the loading wheels 21. These wheels are so located and rotate at such speed that they engage the under side of the forward end of the package and raise the same and bring it on to the top of said loading wheels, but do not engage said packages sufficiently to cause the packages to pass over said wheels. While the package resting on the loading wheels is in this position, one of the push bars 20 comes along and engages the under side of the bottom wall of the package (see Fig. 2), and as the push bar moves along with the carrier chains the box so engaged will be carried over the loading wheels and onto the floor 22, resting on said push bar. The position of the box will now be substantially as indicated by dotted lines in Fig. 2. As the push bar travels forward the box or package moves over the horizontal part of the floor 22, resting at its forward end on said floor and at its rear end on the push bar and slightly raised above the floor, maintaining substantially the position shown by the dotted lines at the left in Fig. 2. As the forward movement of the push-bar continues the box reaches a portion where both ends are in contact with the floor, as shown by full lines at the center of Fig. 2. This will cause the box to remain stationary while the push bar moves out from under it. When the next push bar comes along it will engage the rear end of the box and will push the same up the elevator to the top thereof and deliver it to the gravity carrier at that point. As the box reaches the part of the elevator where the floor is more depressed the point of engagement of the push-bar with the box will be shifted higher upon the box as shown by full lines at the upper right hand of Fig. 2. In this operation of the elevator the arrangement and location of the floor relatively to the traveling push bars is of great importance, for the reason that the floor being substantially on a level with the under side of the push bars throughout the lower bend of the elevator (which is the location where push-bar passes out from under the box or package) the boxes or packages are held in a position very nearly parallel with said floor, or in other words the push bar that is under the box or package, does not raise the end of the box or package very much from the floor, and there is, therefore, no possibility of the box or package tipping over on its end and tumbling down the elevator or off onto the floor. If the floor of the elevator were carried throughout at substantially the same distance from the path of the push bars, then, as any push bar and the box resting on top of it reached the bend in the elevator and began to travel upward, the box would assume quite an acute angle, one end of the box resting on the push bar and the other on the floor, and the box would be very apt to tip over on its end. This would give it sufficient impetus to cause it to turn over several times, and possibly go off from the elevator onto the floor. By my improvement in the location and arrangement of the floor, in respect to the path of travel of the push bars, I obviate this objection and insure the rapid and perfect travel of the boxes or packages along the elevator.

It is obvious that the details of construction may be varied in many particulars without departing from my invention.

I claim as my invention:

1. The combination, in an inclinable elevator, with an elevator frame having the main portion thereof upwardly inclined, the lower portion thereof substantially horizontal, and a bend or turn uniting said inclined and horizontal portions, of an endless carrier provided with push bars arranged to travel along said frame, and a floor extending through said frame between the upper and lower reaches of said carrier, and having its upper surface approximately coincident with the line of travel of said push bars in the turn or bend of said elevator, substantially as described.

2. The combination, in an inclinable elevator, with an elevator frame having the main portion thereof upwardly inclined, the lower portion thereof substantially horizontal, and a bend or turn uniting said inclined and horizontal portions, of an endless carrier provided with push bars arranged to travel along said frame, and a floor extending through said frame between the upper and lower reaches of said carrier, and having its upper surface approximately coincident with the line of travel of said push bars in the turn or bend of said elevator and at a lower level in said horizontal and inclined portions of said elevator, substantially as described.

3. The combination, in an inclined elevator, with an elevator frame having the main portion thereof upwardly inclined and the lower portion thereof substantially horizontal, and a bend or turn uniting said inclined and horizontal portions, of an endless carrier provided with push bars arranged to travel along said frame, and a floor extending throughout said frame between the upper and lower reaches of the carrier, said floor being located nearer to the line of travel of the carrier in the bend than it is in the horizontal and inclined portions of the frame, substantially as described.

In witness whereof, I have hereunto set my hand this 26″ day of August 1914.

FRANK ERNEST MOORE.

Witnesses:

E. A. Brown,

F. F. Winchester.