H. H. JOHNSTON.

ELEVATOR.

APPLICATION FILED NOV. 29, 1907.

1,022,681. **Patented Apr. 9, 1912.**

3 SHEETS—SHEET 1.

Fig. 1.

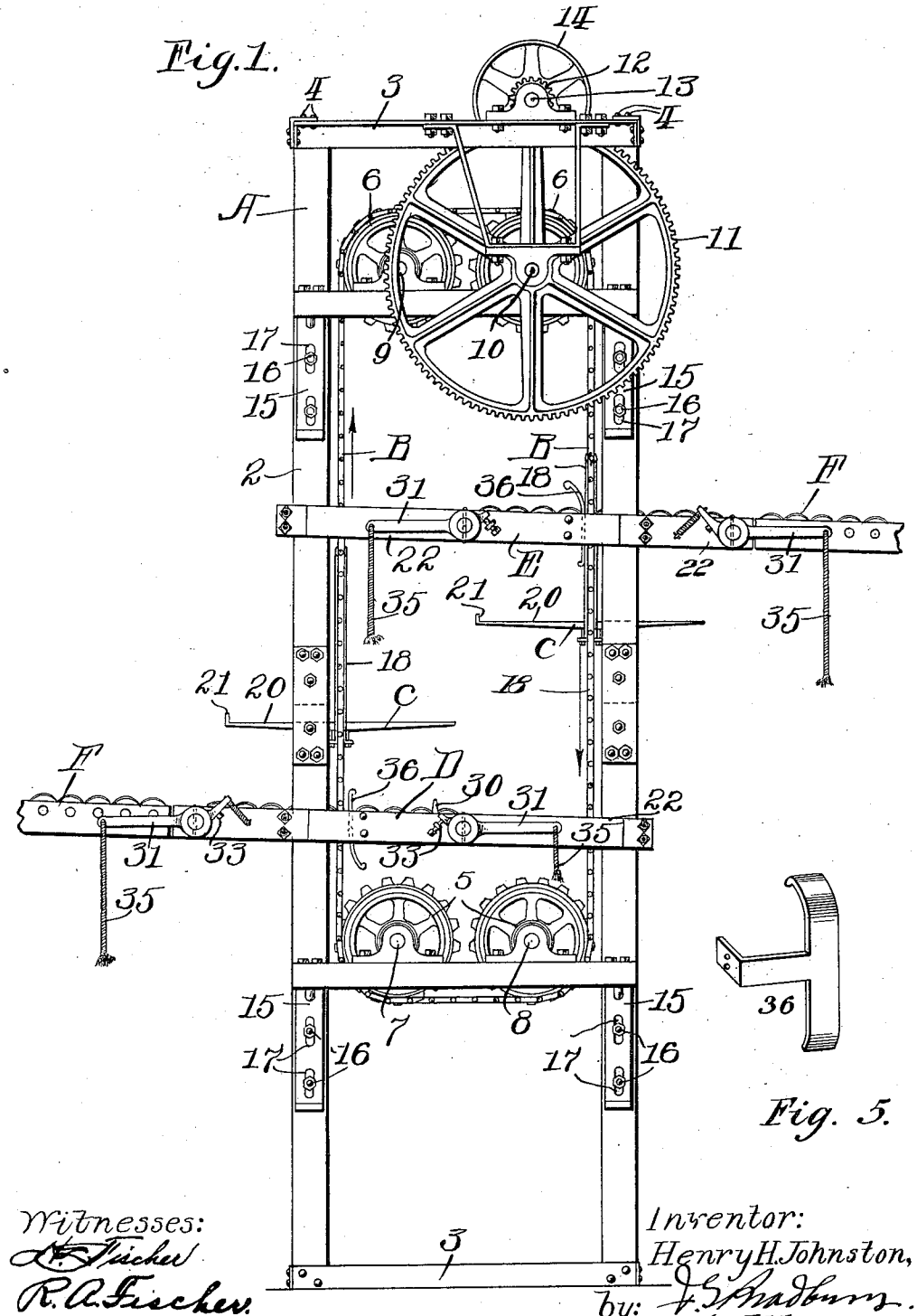

Fig. 5.

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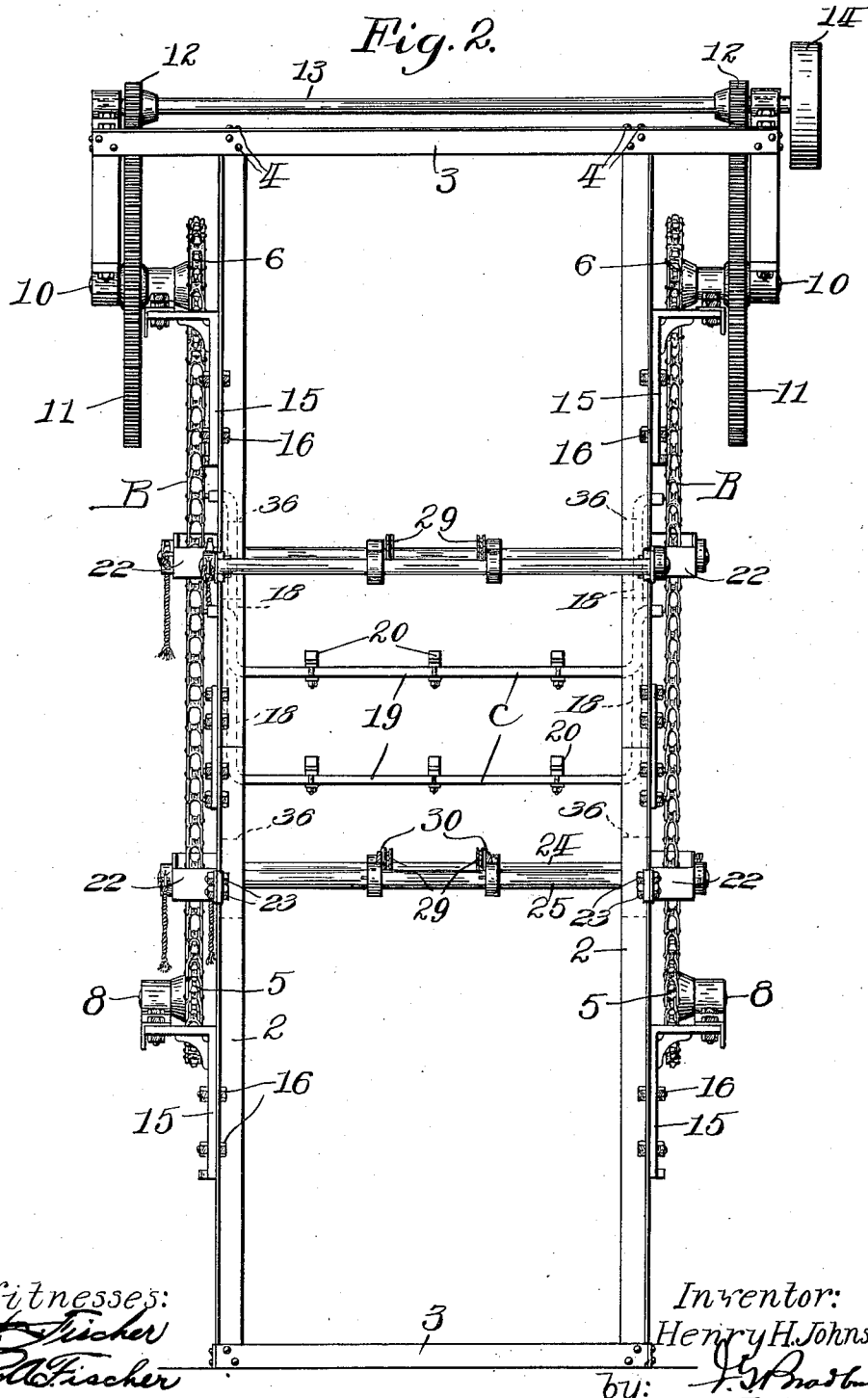
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

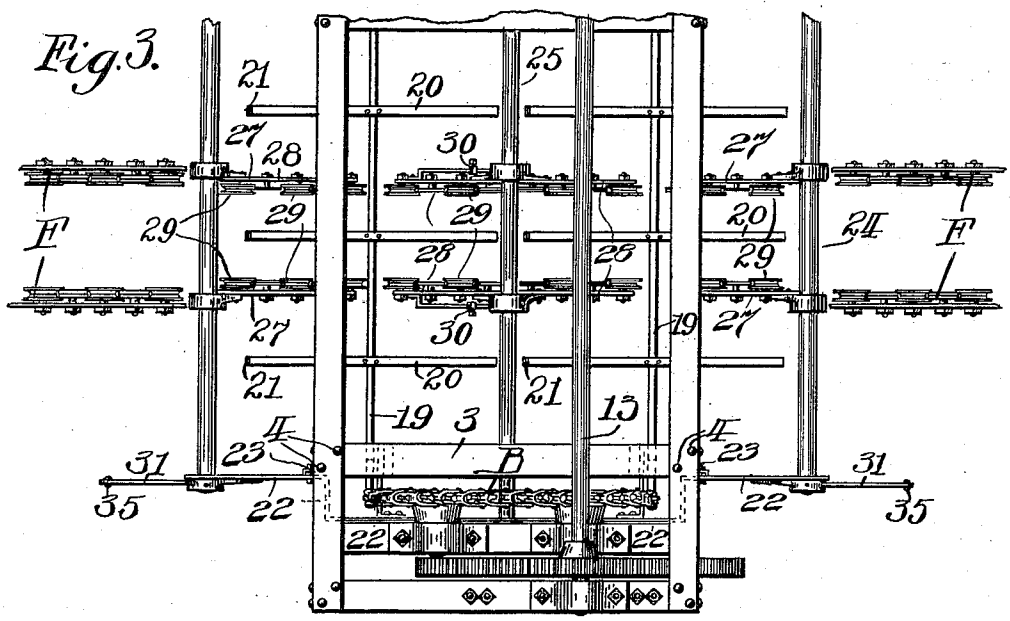
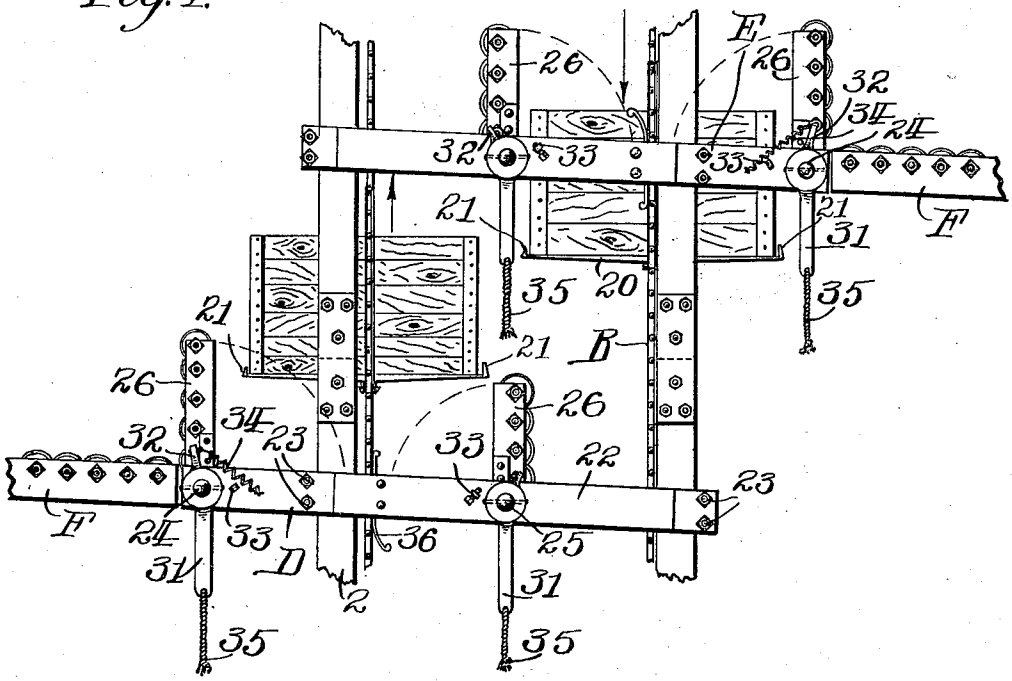


Fig. 4.



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ELEVATOR.

1,022,681. Specification of Letters Patent. **Patented Apr. 9, 1912.**

Application filed November 29, 1907. Serial No. 404,243.

To all whom it may concern:

Be it known that I, HENRY H. JOHNSTON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Elevators, of which the following is a specification.

My invention relates to improvements in straight lift elevators of the kind used in warehouses for hoisting and lowering boxes or articles of merchandise from one floor to another without reversing the motion of the elevator, and which are capable of loading and unloading themselves while in motion, its object being primarily to provide improved means for steadying the elevator platform when it registers with the loading or unloading floor or platform, and for preventing it from being tilted out of horizontal position under the weight of the articles of merchandise.

The mechanism is particularly, although not exclusively, adapted for use in connection with gravity conveyers, the discharge ends of which deposit the articles of merchandise directly upon the carrier, and the receiving ends of which project into the path of the carrier so as to receive articles of merchandise therefrom and carry them to another level.

To these ends the invention consists in the construction, combination and arrangement of parts hereinafter described and claimed.

In the accompanying drawings forming part of this specification, Figure 1 is a side view of my invention; Fig. 2 is a front view; Fig. 3 is a sectional detail plan view; Fig. 4 is a detail side view showing the loaders and unloaders in superior position, and Fig. 5 is a perspective view of one of the shoes or guides.

In the drawings A represents a suitable frame preferably made of angle iron and provided with four vertical posts 2 and transverse bars 3 which are suitably fastened to said posts such as by rivets 4. Traveling in the direction of the arrows indicated in Fig. 1 are a pair of elevating link belts B which travel around pairs of idle sprockets 5 near the lower end of the frame and pairs of sprockets 6 at the upper end of said frame. These sprockets are mounted upon gudgeons 7, 8, 9, and 10 which in turn are suitably journaled upon the frame. The gudgeons 10 carry drive gears 11 which mesh with pinions 12. These pinions are carried by a shaft 13 which is journaled upon said frame and adapted to be driven by a pulley 14 or other suitable means.

By the mechanism described the link belts are driven continuously at the same surface speed around the sprockets in the vertical frame. The cross bars upon which the lower and upper gudgeons are journaled are adjustably supported upon brackets 15 which are secured to the sides of the frame by bolts 16 passing through vertical slots 17 in said brackets. By loosening the nuts on the bolts 16 the cross bars may be moved up or down and thus made to take up and adjust the slack in the link belts B.

At suitable distances apart on the belts are elevating carriers C, each of which consists of a pair of hangers 18, each pair being suspended from the belts and being formed upon their lower ends with a horizontal bar 19 which traverses the space between the belts. The bar 19 of each carrier has suitably secured thereto a plurality of horizontal supports 20 forming the floor of the carrier. The inner and outer ends of these supports are formed with shoulders 21 to prevent boxes or other articles of merchandise sliding off of the carriers.

Carried by the frame and at suitable positions to conduct the articles of merchandise to and from the carriers are a loader D and an unloader E which are substantially similar in construction, the loader being located at a lower elevation than the unloader E and adapted to be placed in juxtaposition to gravity or power conveyers F leading to and from the elevator at suitable elevations, such as upon the different floors of a building. For convenience in explaining these devices the loader will be described, the reference letters and description applying equally to the unloader.

Carried by the frame at a slight incline leading in the direction in which the articles of merchandise are advancing on the gravity conveyer with which this invention is adapted to coöperate are a pair of inclined bars 22 which are secured to the frame by means

of the bolts 23. On the receiving ends and between the ends of the pair of bars are hinged suitable shafts 24 and 25, each of which carries a short section of gravity conveyer 26. The inner ends of these sections are spaced apart when in lowered position and turn down from superior position and form a substantially continuous floor upon which articles of merchandise are adapted to run. The inclination of the floor of the loader is down into the path of the ascending carrier, and of the unloader, down and out of the path of the descending carrier. Each section of the floor of the loading and unloading devices consists of a pair of parallel rails 27 and 28 on the sides of each of which is journaled a train of anti-friction wheels or rollers 29. The inner section of the floor of the loader is provided with a pair of stops 30, against which articles of merchandise are adapted to abut when entering the elevator in proper alinement to be lifted by the carriers. Such stops are not used in connection with the unloader. In Fig. 1 the hinged portions of the floors of the loader and unloader are in lowered position and adapted to load and unload articles of merchandise on and off of the elevator. The ends of the shafts 24 and 25 are provided with bell crank levers 31 having short arms 32 which are adapted to impinge upon lugs 33 and support the sections of the floor of the carrier in alinement when in lowered position. A draw spring 34 between each of the arms 32 and the frame tends to draw the outer section of each floor down into lowered position. Cables 35 attached to the long arms of the bell crank levers 31 are used for elevating and lowering the sections of the floor of the carrier from a distance. When in superior position (see Fig. 4) the sections of the floor permit the carriers to pass them without coöperating with the carriers, such means being adapted for use in buildings where several conveyers at different elevations coöperate with the elevator.

In order to steady the elevator carriers when they arrive at the loading or unloading stations, and to prevent the floor of the carriers from being tilted out of horizontal or operative position under the weight of the load thereon, rigid shoes or guides 36 are secured to the side bars 22 of the elevator frame at each loading and unloading station and projected inwardly in position to be engaged and swept by the hangers 18. Thus the shoes will hold the hangers from swinging laterally on their pivotal support in the belts, and will keep the floors of the carriers substantially horizontal while the carrier is opposite the loading or unloading platform.

In use the belts are driven continuously and the articles of merchandise pass along the conveyer onto the loaders. The horizontal arms 19 of the carriers pass the sections of the floor of the loader, while the transverse supports 20 pass between the adjacent ends of the sections, whereby the articles of merchandise are first lifted from the loader and then deposited upon the unloader E, whence they pass down by gravity along the gravity conveyer.

I claim as my invention:

1. In an elevating apparatus, the combination with an upright frame, of a pair of elevating belts operating vertically in said frame, a pair of hangers pivotally suspended from said belts, a carrier floor fast upon the lower ends of the hangers, gravity conveyers on each side of said belts and intercepting the path of said carrier floor, and rigid shoes projecting inwardly from the sides of the elevator frame at intervals near the ends of the gravity conveyers in position to be engaged and swept by said carrier-hangers, whereby to steady the carrier floor and hold it from tilting when it coincides with a gravity conveyer.

2. In an elevating apparatus, the combination with a suitable frame having upright posts, elevating belts operating vertically between said posts, cars suspended between said belts, rigid guides at intervals on each side of said frame adapted to steady the lower portions of said cars, a platform having substantially horizontal bars spaced apart on each car, a loader and an unloader in the path of said cars, and means for driving said belts.

3. In an elevating apparatus, the combination with an upright frame, of rigid shoes arranged at vertical intervals on the sides of the frame, elevating belts operating vertically in said frame, and carriers pivoted at intervals on said belts and having horizontal floors, said carriers being adapted to pick up packages on one side of said belts and deliver them on the other side thereof, and said shoes being stationed at each landing to assist in supporting said carriers with their floors in horizontal position.

4. In an elevating apparatus, the combination with an upright frame, of an elevating belt working vertically in said frame, an elevator carrier hung from said belt, a gravity conveyer arranged on each side of the belt and intercepting the path of said elevator carrier, and rigid shoes arranged at intervals on the sides of the frame in position to guide and steady the elevator carrier when said carrier coincides with the gravity conveyers.

5. In an elevating apparatus, the combination with an upright frame, of an elevating belt operating vertically in said frame, a carrier hung from said belt having a hori-

zontal floor, rigid shoes associated with said carrier and located at intervals on said frame, a loader hinged in the path of said elevating carrier and having a stop at its inner end, and an unloader hinged in the path of said carrier on the lower side of said belt.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HENRY H. JOHNSTON.

Witnesses:
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