

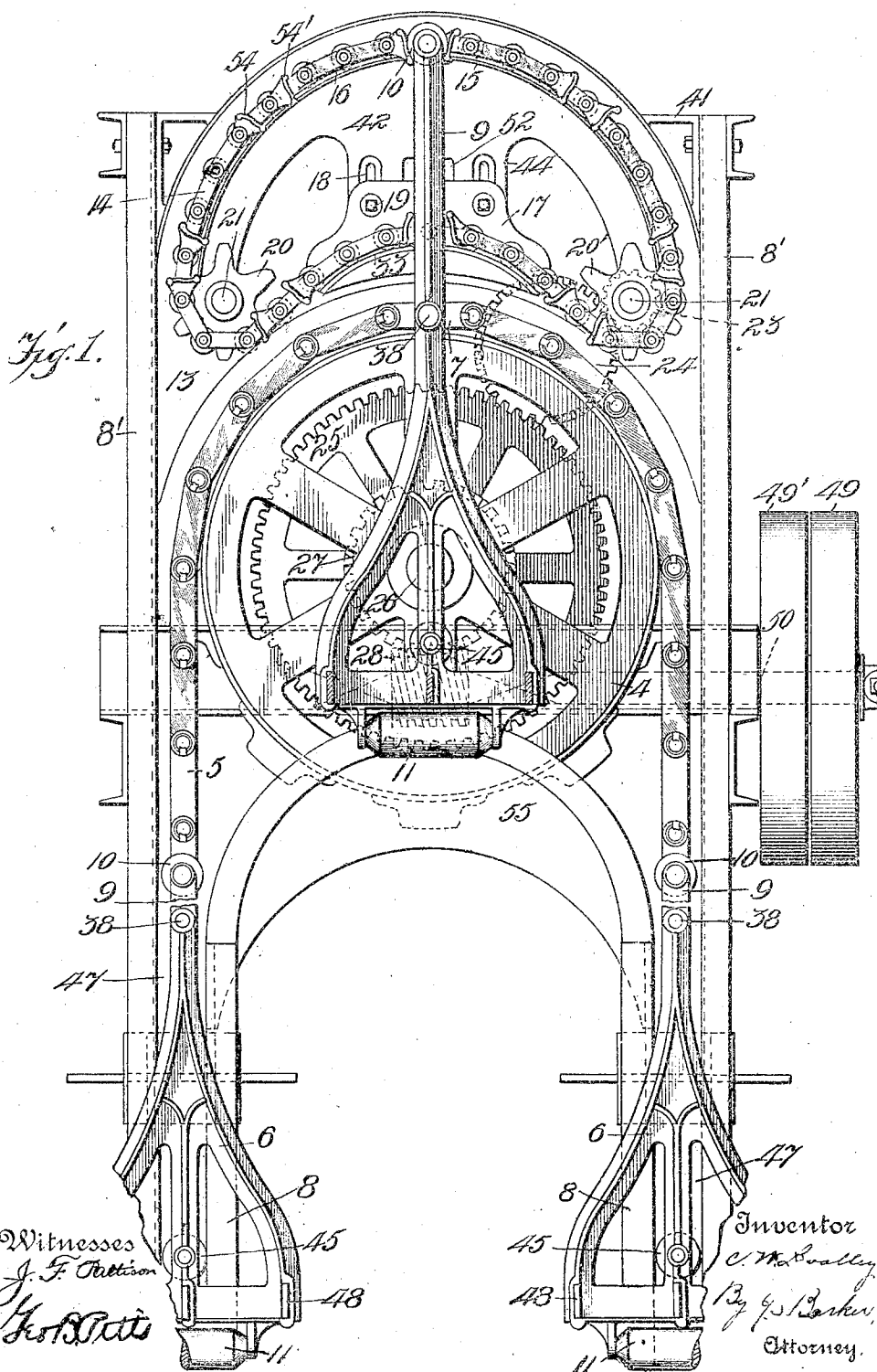
No. 896,029.

PATENTED AUG. 11, 1908.

G. W. LEVALLEY.
CONVEYER.

APPLICATION FILED DEC. 2, 1907.

5 SHEETS—SHEET 1.



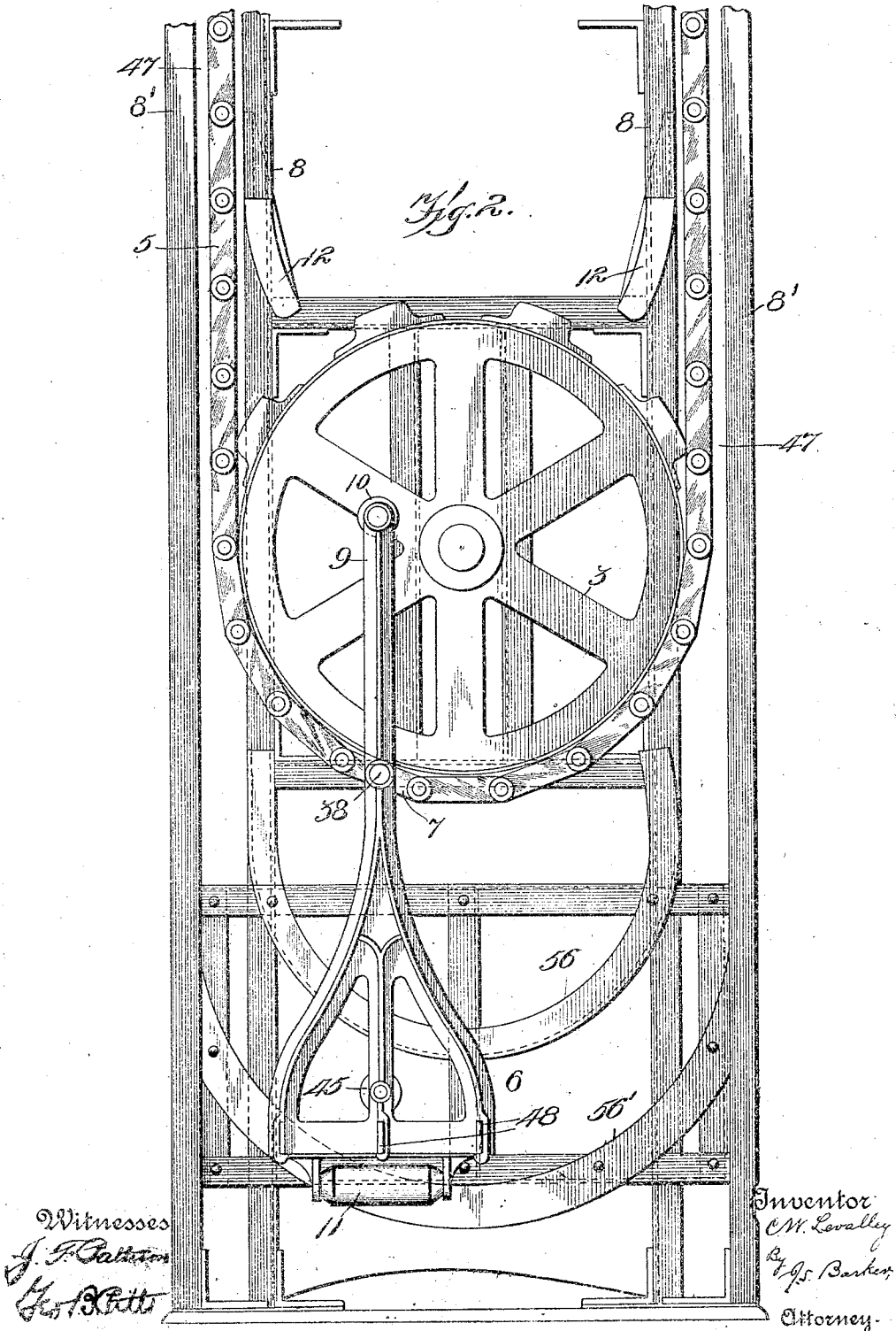
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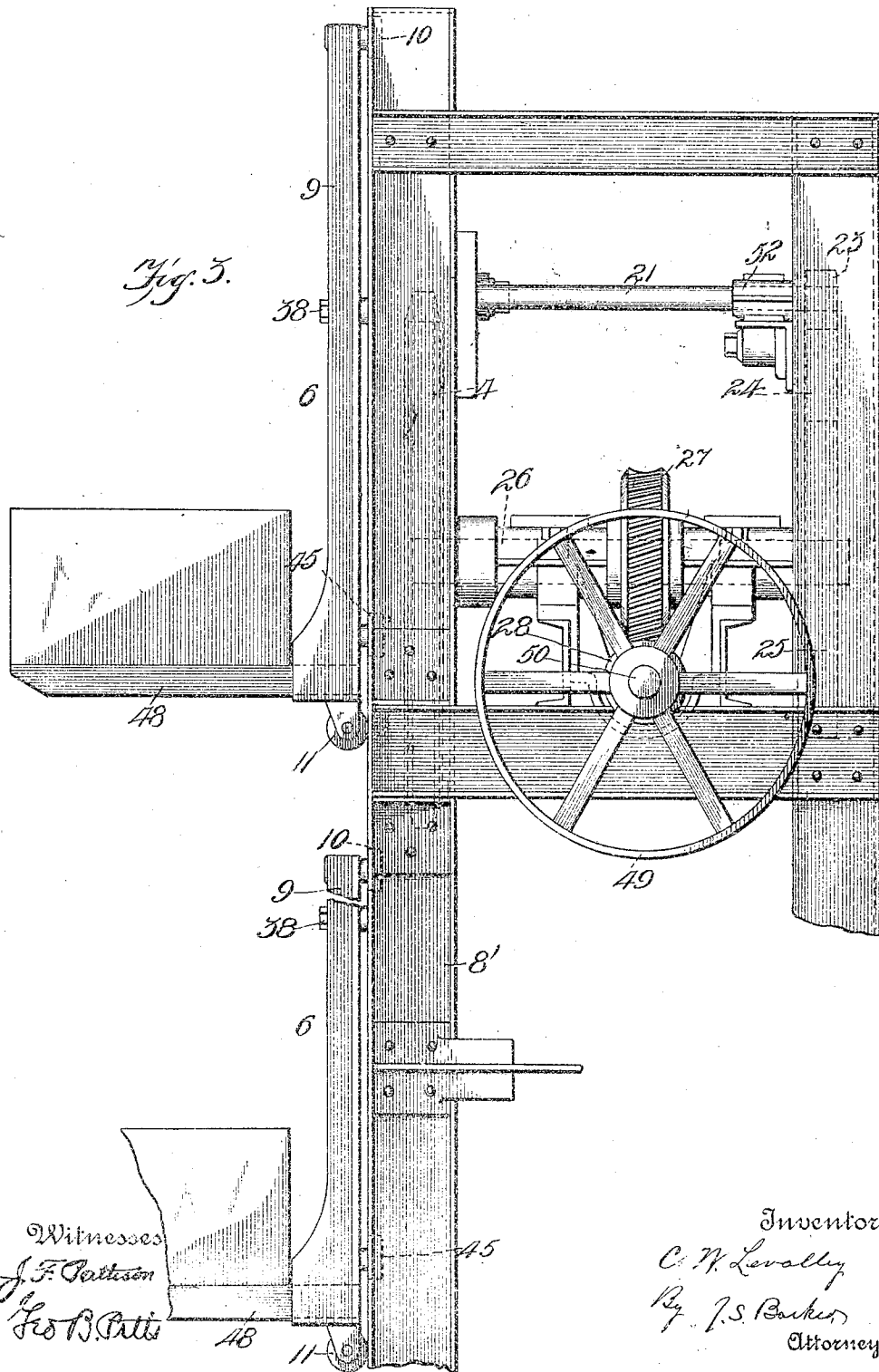


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5 SHEETS—SHEET 3.



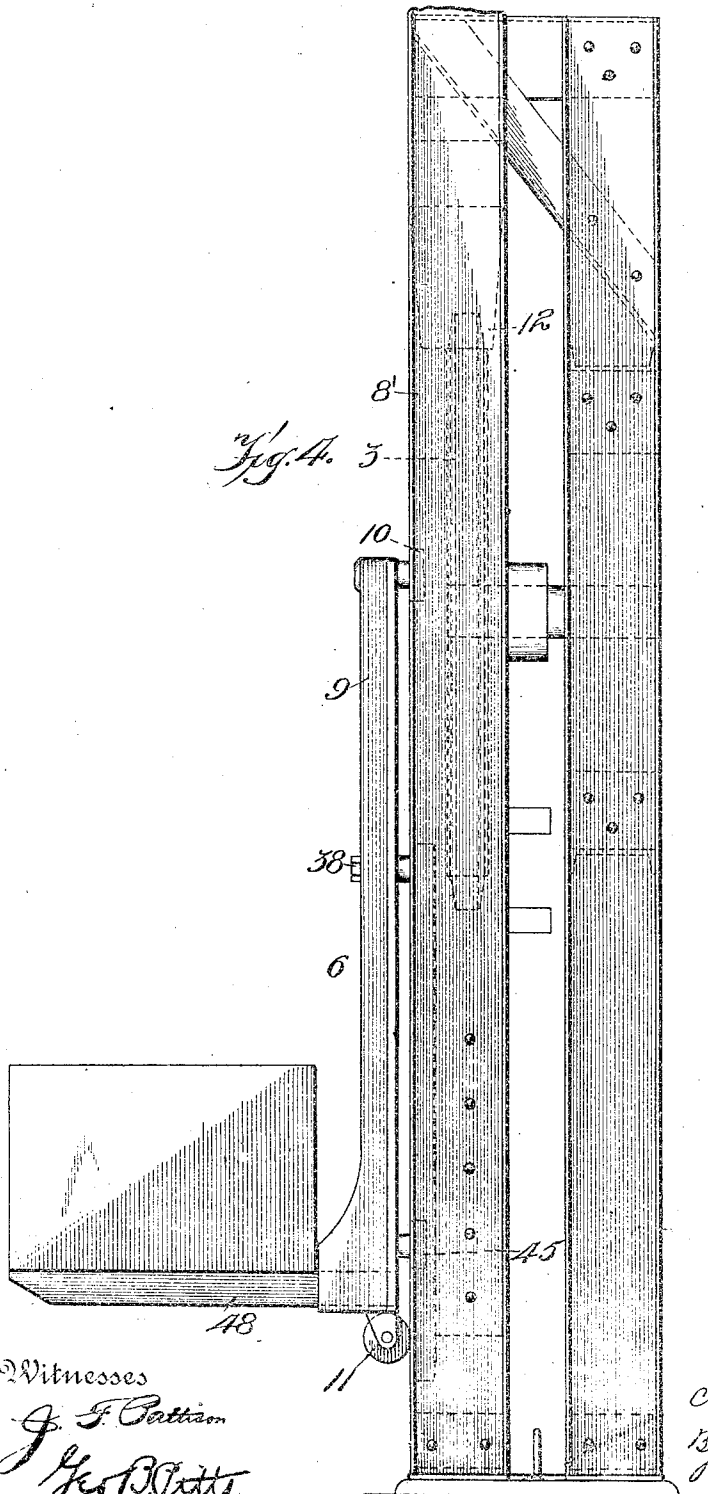
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5 SHEETS—SHEET 4.



Witnesses

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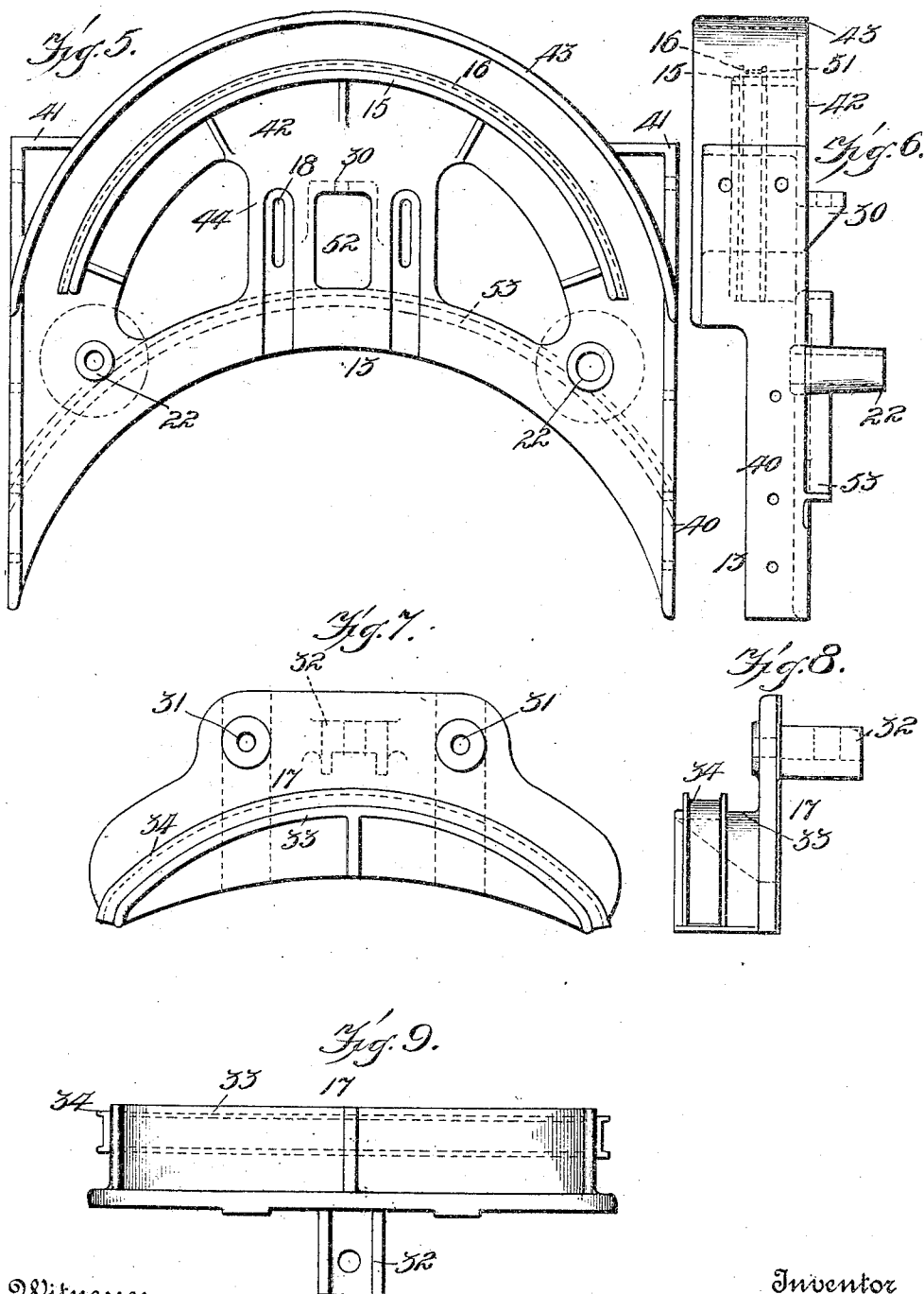
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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CONVEYER.

No. 896,029.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed December 2, 1907. Serial No. 404,789.

To all whom it may concern:

Be it known that I, CHRISTOPHER W. LEVALLEY, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Conveyers, of which the following is a specification.

This invention relates to endless conveyers or elevators usually employed for transporting packages from one floor or level of an apartment to another, and particularly to conveyers of the single strand or line of belting type. Elevators of this character usually have both runs or branches of the endless belt travel in a plane that is adjacent to and parallel with a wall surface, though this is not essential. From this belt are suspended a series of swinging load carriers pivotally connected with the belting in any desired way. Examples of this type of elevator or conveyer are described and illustrated in my Patents No. 799,993 of September 19, 1905 and No. 832,986 of October 9, 1906.

In the accompanying drawings Figure 1 is a front elevation of the upper portion of an elevator embodying my improvements. Fig. 2 is a similar view of the lower part of the elevator. Figs. 3 and 4 are edge views of the parts illustrated in Figs. 1 and 2, respectively. Fig. 5 is a front view and Fig. 6 is an edge view of the frame piece or support for the cross-over steadying mechanism arranged adjacent to the head wheel. Fig. 7 is a front view, Fig. 8, a side view, and Fig. 9, an inverted plan view of the tightening device for the steadying cross-over chain.

In the accompanying drawings 5 designates the endless element of the elevator, which is represented as being formed of a series of articulate sprocket links constituting a single strand or line of chain belting. This is supported upon suitable head and foot wheels designated, respectively, 4 and 3, which are supported in suitable frame-work located at the opposite ends of the apparatus. The elevator extends through the structure from floor to floor, suitable means for loading and unloading being provided at different levels; but it has not been deemed necessary to indicate these parts nor any portions of the structure in which the elevator is arranged. The line of endless belting supports and moves a series of package or article carriers 6, in many respects similar to

those illustrated in my aforesaid patents, 55 though having specific features of difference that are to be pointed out. Each carrier is pivotally connected, by pin or bolt 38, with a link 7 of special construction constituting a part of the line of belting 5. The carriers are supported so as to swing freely upon their pivotal supports in order that they shall maintain upright positions as they pass the head and foot wheels, respectively, as is common in this type of elevator. 65 As shown, each carrier is provided with a series of outward extending fingers or supports 48, constituting a sort of platform upon which rest the loads to be moved. These may be variously shaped to suit the character of the packages or articles to be handled. 70

The frame of each carrier is extended upward beyond its pivot 38 to form a steadying arm 9, at the upper end of which is supported a wheel or roller 10. The carrier is preferably provided at some point below the pin 38 with another roller 45. These two rollers, 10 and 45, are arranged to run in the spaces, 47, between the upright bar 8, 8' of the supporting frame-work of the elevator. The vertical up and down runs or branches of the belting 5 are also situated in the ways 47. The upright bars are preferably of channel form, and their outer surfaces constitute bearings against which run the rollers 11, 85 supported at the lower ends of the elevators 6 and arranged with their axes of rotation at right angles to the axes of the rollers 10 and 45.

The inner bars 8 terminate just above the foot wheel 3 and have connected with their lower ends guides 12, arranged to direct the rollers 10 and 45, particularly the former, into the channels 47, as the carriers start on their upward travels after having made the turns at the lower end of the elevator. It will be understood that an elevator, such as is being described, is adapted to run in either direction as may be desired, therefore each of the inner bars 8 is provided with a guide 12 such as has been described. 100

Power to drive the elevator is transmitted from one of the turning sprocket wheels, preferably the head wheel 4. 50 designates the main power shaft upon which are mounted the fast and loose pulleys 49, 49'. This shaft, which is suitably supported in the head frame-work, carries a worm 28 that meshes 105

with a worm wheel 27 secured to the shaft 26 upon which is mounted the sprocket wheel 4.

In operating conveying apparatus of the kind herein illustrated it is customary to load the carriers as they move upward and to unload them at the desired place as they are moving downward, and this makes it necessary that the loaded carriers shall pass the head turning wheel 4, crossing from the upwardly moving to the downwardly moving branches of the elevator. It has been found very desirable to steady the carriers while making the cross over movements just referred to in order to prevent the swinging of the carriers, which might endanger the loads supported thereby, as well as prevent the guiding wheels 10 and 45 from properly entering the ways 47 as they begin to move downward.

I have devised a guiding and steadying mechanism that is located above the head wheel 4 so as to engage with the roller 10 at the upper end of the arm 9 of the carrier. The steadying mechanism here shown and which I prefer to employ is flexible, being of chain belt type, and is preferably positively driven. It is mounted in a head piece or frame 13 suitably supported near the turning wheel 4, and is so supported that one branch thereof is arranged to travel in a path substantially parallel with that part of the elevator chain 5 that is in engagement with the wheel 4, the guiding and steadying chain being provided with attachments for engaging with the rollers 10 of the carriers.

The frame 13, which is preferably a single piece of casting, is supported between the upper ends of the outer vertical guide bars 8, it being provided with brackets 41 that are bolted to the guide bars or other supporting frame-work. From the base or back plate, 42, of the frame 13 there extends a forwardly projecting curved bracket 15 of flange-like construction, and so shaped that when the frame is set in place its outer face is substantially parallel with the pitch line of the upper portion of the wheel 4. Upon this bracket or flange 15 there is supported a channel 16 adapted to constitute a guide or track for the upper branch of the steadying chain belt 14. If desired, the channel may be provided with a steel lining or wearing band 51. The frame 13 is provided along its upper edge with an overhanging flange 43 arranged to cover and guard the upper branch or run of the guide chain.

20, 20' indicate sprocket wheels mounted upon shafts 21 and supported in the frame 13, near the sides thereof. With these wheels the guiding, belting 14 engages, its course being in part guided and directed thereby. One of the wheels is positively actuated from a suitable source of power, thus constituting a driver for the cross over guide. The shafts upon which the sprocket

wheels 20, 20' are mounted are supported in bearings 22 carried by the frame-piece 13, and that shaft on which the driving sprocket 20' is mounted is extended rearwardly as indicated in Fig. 3, where it is mounted in suitable supports 52, and carries a spur pinion 23. This pinion is in gear, through an idler 24, with the spur pinion 25 on the driven shaft 26. This shaft as has been explained, carries the turning sprocket wheel 4 for the elevator or conveyer and is itself positively driven.

The lower or idle run or branch of the guiding chain is in engagement with a tightening device by means of which the chain is kept under proper tension. This tension or tightening device, designated as a whole by 17, is arranged to be supported adjustably upon the frame-piece 13, the latter being provided with a centrally disposed web portion 44 arranged between the main part of the back plate 42 and the arch-shaped section of the frame-piece, as indicated in Fig. 5.

The adjustable tension piece 17 is provided with a forwardly extending curved flange or bracket 33, upon which is supported a channel 34 constituting the guide for the lower branch or run of the chain 14; and with a bracket or lug 32 extending rearward and adapted to project through an aperture 52 in the web 44 of the frame-piece 13. This bracket lies below a bracket or lug 30 that extends rearwardly from the frame-piece 13, and each of these brackets, 30 and 32, is perforated to receive an adjusting or take-up screw by which the position of the tension-device 17 is controlled.

19, 19 indicate bolts which pass through apertures 31 in the take-up or tension-piece 17, and through slots 18 in the web 44 of the frame-piece 13, and by means of which the position of the part 17 is secured, after it has been adjusted.

Certain of the links of the chain 14 are of special construction, being provided with wings 54, 54', so shaped that a pair of them constitutes a seat for a roller 10 during the time that the chain is in engagement with the curved guide 15 or the channel which may be carried thereby. The wings separate somewhat as they pass a sprocket wheel, 20, 20', thus enlarging the space between them, and insuring that the rollers 10 shall easily enter or leave the spaces between them.

While I have illustrated and described the endless flexible guiding device as being located above the head wheel, this being for many reasons the preferred location, it is apparent that it could be arranged below that wheel, in which event the branch or run of the flexible endless guide that is operative would engage with a roller or projection of the carrier located at a suitable point below its pivotal connection 38 with the chain or

belt 5. The upper ends of the inner vertical guide bars 8 are preferably united by a curved connecting piece 55.

The frame-work at the lower end of the apparatus, for supporting the wheel 3, and for allowing the carriers to cross over, may be of any usual or preferred construction. I have represented it as having curved brace pieces 56, 56' uniting the vertical upright guides and frame pieces. The lower brace piece 56' serves as a guide and support for the bearing roller 11 of the carrier as the latter is moved across from one run of the elevator to the other; while the brace piece 56 serves to guide or direct the roller 45 in its proper course.

The curved connecting piece 55 at the upper end of the apparatus serves as a guide and support for the lower portions of the carriers, the rollers 11 bearing against it as the carriers make their cross over movements at the upper end of the elevator. It also serves to direct or guide the rollers 45 into the ways or channels between the upright frame pieces 8, 8'.

The guiding and steadying chain 14 is so timed in its movement with reference to the carrier chain 5, that the wings 54, 54' are always in position to receive the roller 10 or other projection provided to engage with them, as it comes opposite the rear portion of the steadying device.

While I have shown my invention applied to a single strand elevator, for which the improvements herein described have been especially devised, it is evident that they are applicable to elevators or conveyers in which are employed two sets of endless chain or belting as the supporting and moving means for the carriers for articles which they support and which project to one side of the plane in which the two branches of each of the strands of chain or belting travel; an elevator of this type, but without my present improvements, being illustrated in U. S. Patent No. 220,137 to L. W. Greenleaf, dated September 30, 1879.

What I claim is:—

1. In a conveyer, the combination of an endless belt, a series of carriers pivotally connected therewith, free to swing on their pivots and extending to one side of the plane in which the belt travels, and a steadying guide for each carrier extending upward beyond its pivotal connection with the belt, arranged to maintain the carrier in its upright position while being moved, substantially as set forth.

2. In a conveyer, the combination of a belt, a series of carriers pivotally connected therewith, free to turn on their pivots and arranged to one side of the plane in which the belt travels, a supporting and turning wheel with which the belt engages and past which the carriers cross from one run of the

conveyer to another, and a movable guide for steadying the carriers as they make their said cross-over movements, the guide being located outside the loop inclosed by the endless belt, substantially as set forth.

3. In a conveyer for moving articles, the combination of an endless belt, a series of carriers pivotally connected therewith and arranged to one side of the plane in which the belt travels, a head wheel with which the belt engages and past which the carriers move in traveling from the up run to the down run of the conveyer, a movable steadying guide for maintaining the carriers upright as they make the cross-over movements past the head wheel and projections carried by the carriers and extending upward above their pivotal connections with the belt and arranged to engage with the said guide, substantially as set forth.

4. In a conveyer, the combination of an endless belt, wheels by which the belt is supported, an article supporting carrier pivotally connected with the belt, and a flexible movable guide with which the carrier is adapted to engage arranged to steady the carrier as it crosses over from one run or branch of the conveyer to another, substantially as set forth.

5. In a conveyer, the combination of an endless belt, a wheel for supporting the belt, a carrier pivotally connected with the belt, and a guide for steadying the carrier as it moves past the said wheel from one run of the conveyer to another, consisting of an endless chain with which a projection of the carrier is adapted to engage, substantially as set forth.

6. In a conveyer, the combination of a driven belt, a turning wheel by which the belt is supported, a carrier mounted on the belt, an endless flexible guide located adjacent to the turning wheel and arranged to be engaged by and to steady the carrier as it moves past the said wheel from one run of the conveyer to another, and connections for moving the said guide in properly timed relations with the conveyer belt, substantially as set forth.

7. In a conveyer, the combination with an endless belt, a turning wheel for supporting the belt and a series of article carriers pivotally connected with the belt and moved thereby, the carriers being provided with steadying projections, of a guiding and steadying device for the carriers as they move past the said wheel from one run of the conveyer to another comprising an endless chain and projecting attachments carried thereby and arranged to constitute seats for the said projections of the carriers, substantially as set forth.

8. In a conveyer, the combination with an endless belt, a turning wheel by which the belt is supported, and a series of article car-

riers pivotally connected with the belt and moved thereby, the carriers being provided with steadying projections, of an endless flexible and movable guide for the carriers as they pass the said wheel from one run of the conveyor to another, comprising an endless chain and wings carried by the links of the chain and disposed to form seats in which the said projections of the carriers rest, and supports for the said guide, substantially as set forth.

9. In a conveyer, the combination with an endless belt, a turning wheel for supporting the belt, and a set of carriers pivotally connected with the belt and moved thereby, of a guide for steadying the carriers as they pass the said wheel from one run of the conveyer to another, comprising an endless belt, and means for maintaining the said belt guide under tension, substantially as set forth.

10. In a conveyer, the combination of an endless belt, a turning head wheel for supporting the belt, a set of carriers pivotally connected with and moved by the belt, an endless belting adapted to engage with the said carriers and steady them as they cross the head wheel from one run of the conveyer to the other, and a frame in which the cross-over guide is supported adjacent to the turning head wheel, substantially as set forth.

11. In a conveyer, the combination with an endless belt, a supporting head wheel and a set of carriers pivotally connected with the belt, of a cross-over guide for the carriers located adjacent to the head wheel comprising an endless chain with which the carriers engage while making their cross-over movements from one run of the conveyer to another, and supports for the said chain arranged to dispose the operative branch or run thereof substantially parallel with the pitch line of the upper part of the head wheel, substantially as set forth.

12. In a conveyer, the combination of an endless chain, a turning wheel, a set of carriers pivotally connected with the belt and moved thereby, steadying arms connected with the carriers and extending upward be-

yond their pivotal connections with the belt, and a flexible endless guide with which the said steadying arms engage as the carriers pass the head wheel, comprising an endless chain and projecting wings or attachments carried thereby and arranged to constitute seats for said steadying arms, substantially as set forth.

13. In a conveyer, the combination with an endless belt, a head wheel and a series of carriers pivotally connected with the belt and moved thereby, of an endless flexible guide for steadying the carriers as they pass the head wheel from one run of the conveyer to another, a frame for supporting the said cross-over guide arranged to sustain the active branch or run thereof substantially parallel with the upper portion of the head wheel, and a take up or tension device for the cross-over guide adjustably supported by the said frame, substantially as set forth.

14. In a conveyer, the combination of an endless belt, a head wheel for supporting the belt, a set of carriers for articles pivotally connected with the belt, a cross-over guide for the carriers located adjacent to the head wheel and consisting of an endless flexible chain or belting, driving gearing for turning the head wheel and driving gearing for turning the cross-over guide arranged to properly time its movements with reference to the conveyer belt and the carriers supported thereby, substantially as set forth.

15. In a conveyer, the combination with an endless belt, wheels by which it is supported, and an article-supporting carrier pivotally connected with the belt, of a cross-over guide for steadying the said carrier as it moves from one run of the conveyer to the other, the guide being constructed to close upon the carrier during the cross-over movement and to open and release it as it enters the down run, substantially as set forth.

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Witnesses:

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