

No. 614,640.

Patented Nov. 22, 1898.

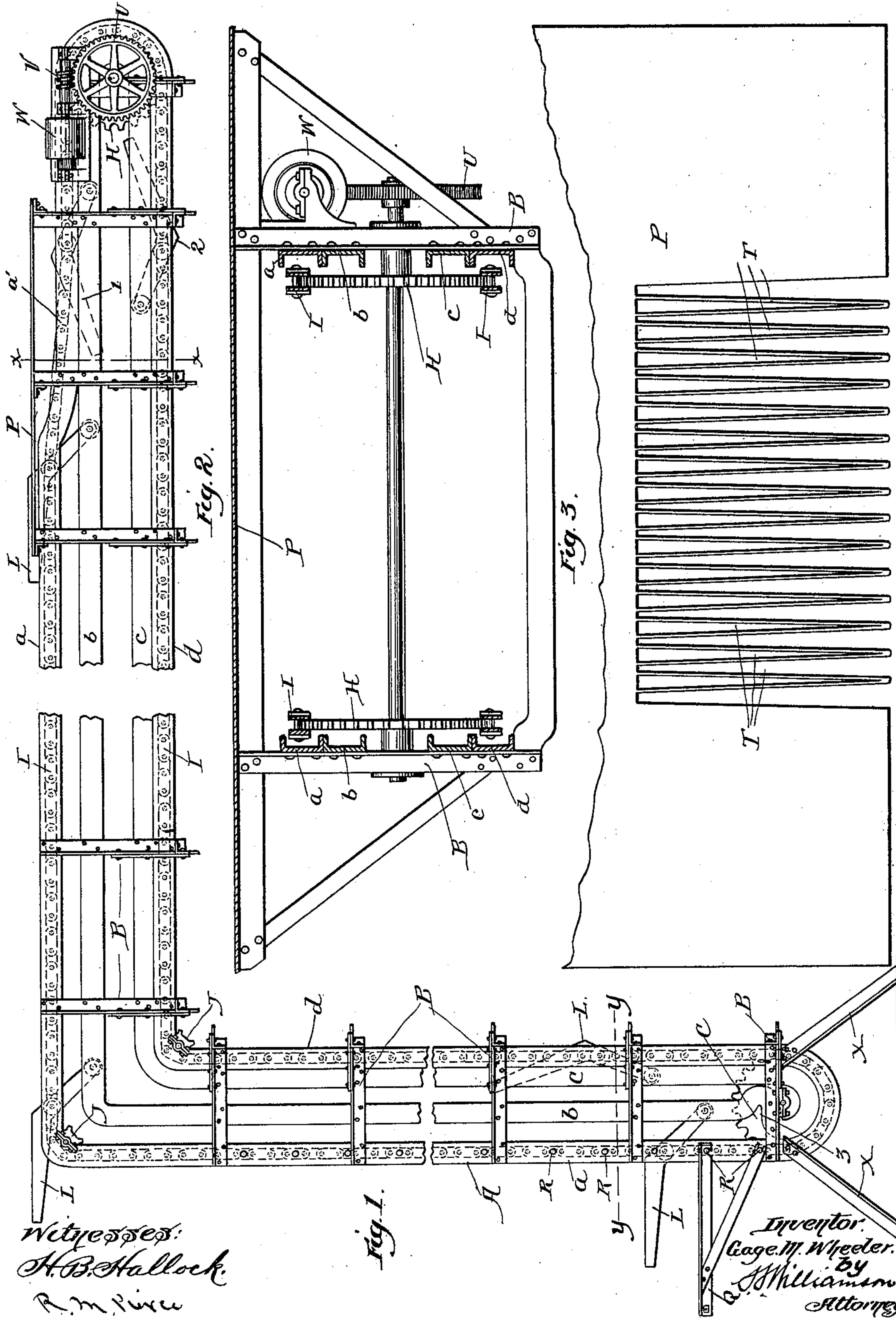
G. M. WHEELER.

AUTOMATIC LOADER, CONVEYER, AND UNLOADER.

(Application filed Feb. 3, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
H. B. Hallock.  
R. M. Pierce

Inventor:  
Gage M. Wheeler.  
By  
J. H. Williamson  
Attorney.

No. 614,640.

Patented Nov. 22, 1898.

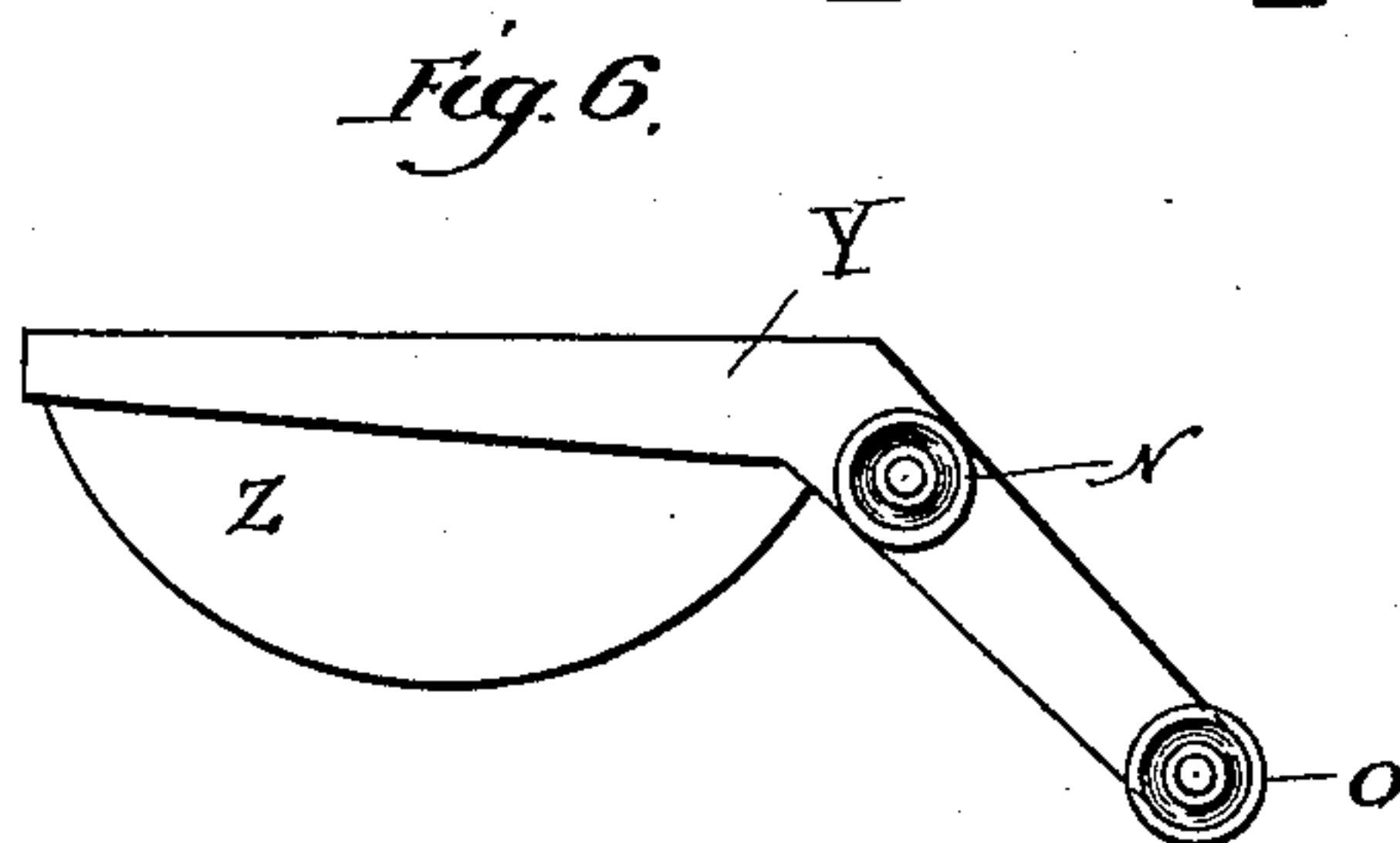
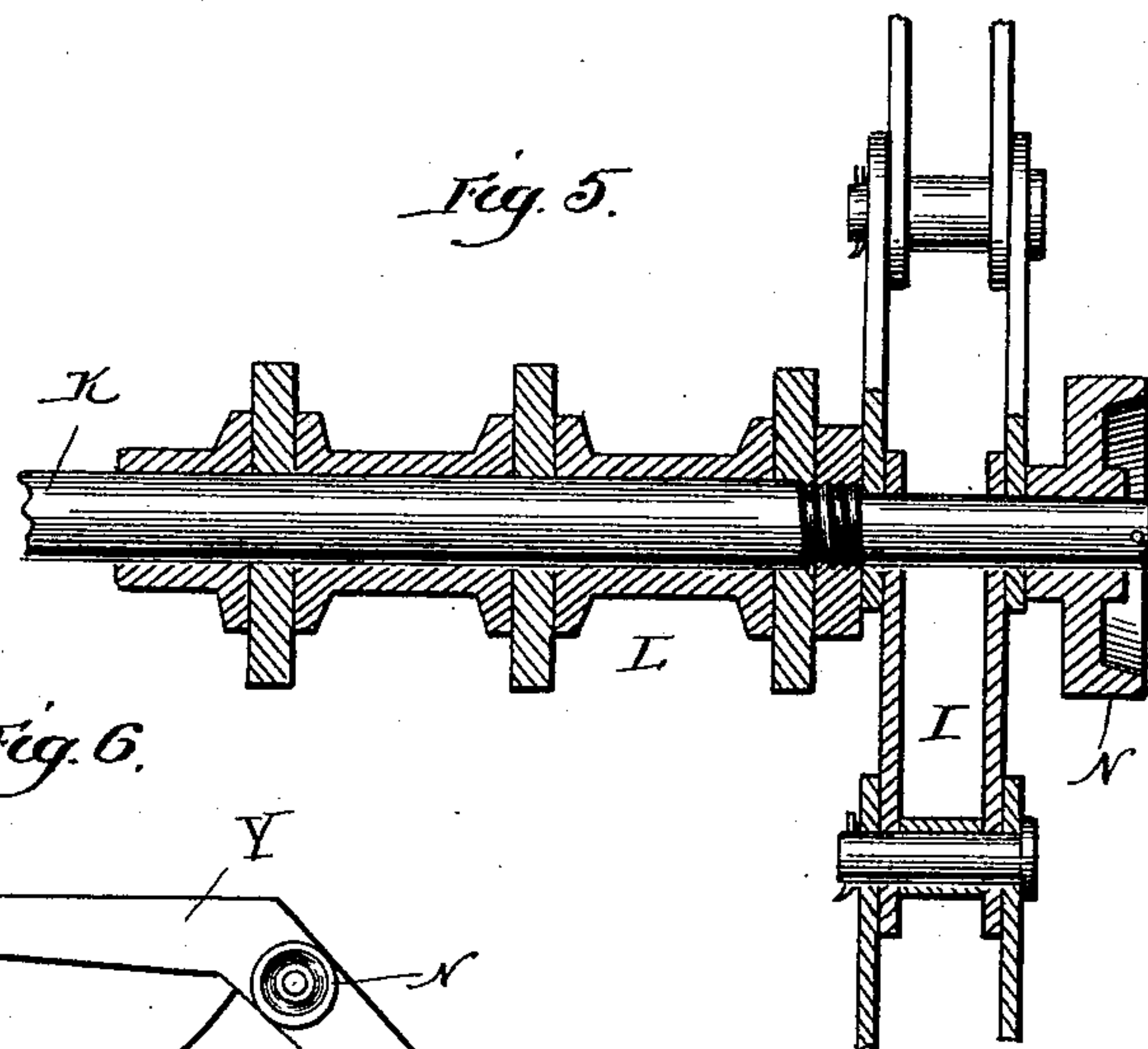
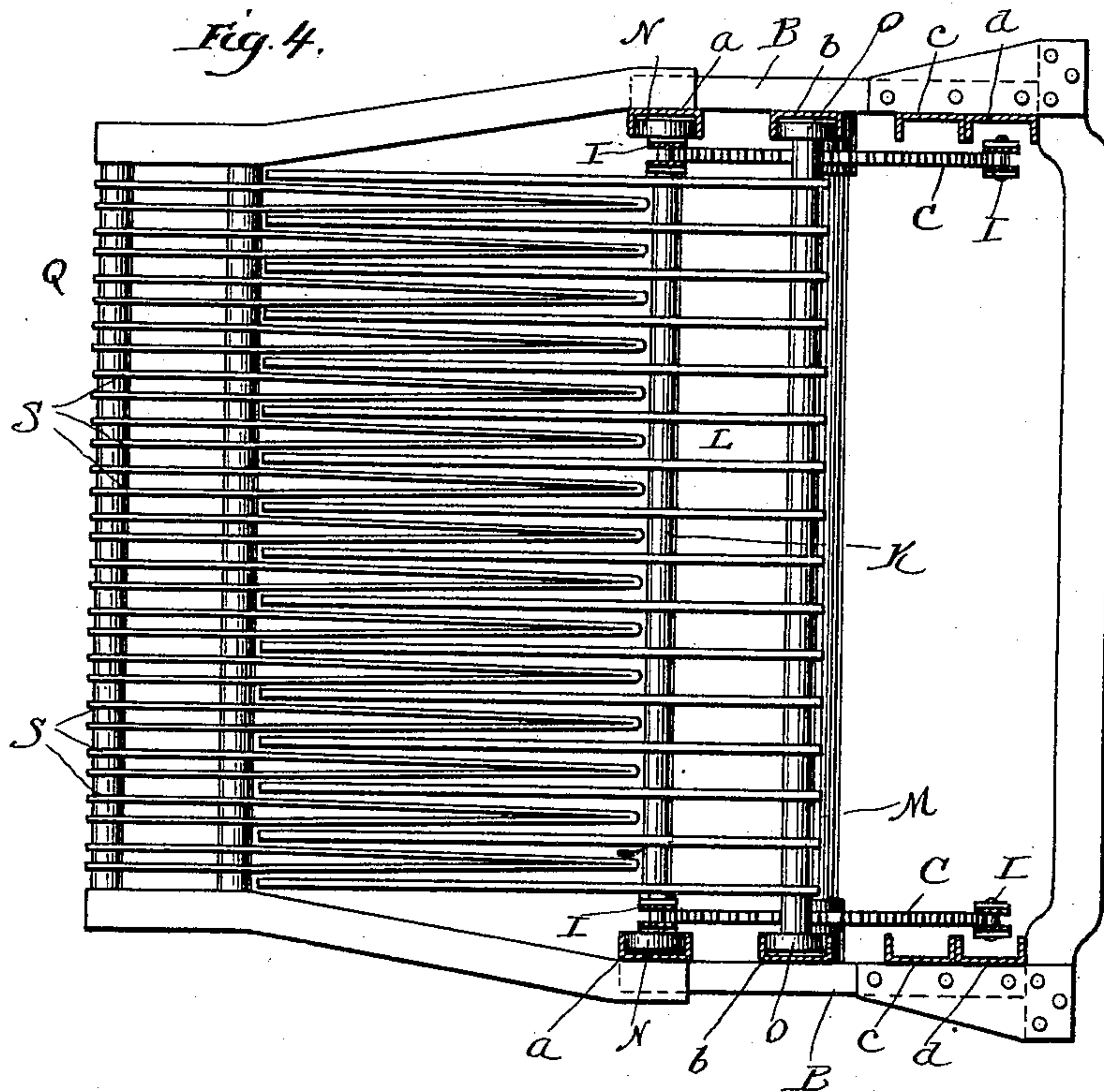
G. M. WHEELER.

AUTOMATIC LOADER, CONVEYER, AND UNLOADER.

(Application filed Feb. 3, 1898.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:  
H. B. Hallock,  
R. M. Pinc

Inventor:  
Gage M. Wheeler,  
by A. Williamson  
Attorney.



# UNITED STATES PATENT OFFICE.

GAGE M. WHEELER, OF TACOMA, WASHINGTON.

## AUTOMATIC LOADER, CONVEYER, AND UNLOADER.

SPECIFICATION forming part of Letters Patent No. 614,640, dated November 22, 1898.

Application filed February 3, 1898. Serial No. 868,977. (No model.)

*To all whom it may concern:*

Be it known that I, GAGE M. WHEELER, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a certain new and useful Improvement in Automatic Loaders, Conveyers, and Unloaders, of which the following is a specification.

My invention relates to a new and useful improvement in automatic loaders, conveyers, and unloaders, and is especially adapted for loading and unloading vessels, and has for its object to provide a simple and effective mechanism for receiving, conveying, and depositing the cargo of vessels either in package or bulk form, so as to bring about an even and continuous motion, which will avoid the enormous delays which are now occasioned by the present methods.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of an apparatus made in accordance with my improvement, portions thereof being broken away; Fig. 2, a cross-section of the unloading-platform; Fig. 3, a plan view of a portion of said platform, showing the fingers through which the carrier passes for depositing a package; Fig. 4, a section at the line *y y*, showing one of the carriers in the act of passing through the loading-platform; Fig. 5, an enlarged section of a portion of one of the cross-rod couplings used to support the carrier; and Fig. 6, a detail elevation of a carrier in shape of a scoop-bucket, which may be used in connection with my invention for loading and unloading coal and the like.

In carrying out my invention as here embodied, A represents the framework of the apparatus, each side of which consists of grooved rails *a*, *b*, *c*, and *d*, connected to-

gether by the cross-iron B, and this frame, as shown, has a vertical section and a horizontal section, the former adapted to pass within the hold of a vessel, while the latter leads to a warehouse or other suitable point of deposit. Sprocket-wheels C are journaled on each side of the lower end of the vertical frame, while corresponding sprocket-wheels H are journaled at the sides of the extremity of the horizontal section and linked carrier-chains I pass over the sprocket-wheels and are guided to run substantially parallel with the sides of the frame by the small wheels J. At given intervals the chains are connected together by the cross-rods K, which support the carriers L, the latter being composed of a series of fingers journaled upon said rods, said fingers terminating in shanks, which are also connected together by the rods M. Each of these rods has mounted upon each end thereof the rolls N and O, respectively, which are adapted to travel in the grooves of the side rails of the frame, as clearly shown. These rails are so located relative to each other that when the carriers are traveling upward upon the vertical section of the frame the fingers will be held in a horizontal position, as clearly shown in Fig. 1, on account of the rolls N journaling in the grooves of the rails *a*, while the rolls O journal in the grooves *b*, and when reaching the top of the vertical section the horizontal position of the fingers will be maintained by the relative position of the rails *a* and *b*, so that the carrier may travel rearward without its position being altered until reaching the unloading-platform P. At this point the rail *a* is deflected downward, as indicated at *a'*, so that the roll N, following the deflection of this rail, will swing the carrier to the position shown in dotted lines at 1. After the carrier has reached this position the continued movement of the chain will carry it around the sprocket-wheel H, where it will assume the position shown at 2, and remains in this position through its backward movement until again passing down the vertical section of the frame to the hold of the vessel. The groove in the rail *c* is concentric with the axis of the sprocket-wheel C until reaching the point 3, where it is of cam shape and passes



into the groove in the rail *b*. The result of this particular arrangement is that when the carrier passes around the sprocket-wheel C it will be brought into a horizontal position, so as to thereafter be in a position to receive a load and continue its movement through the steps just described.

A loading-platform Q is made in bracket form, as indicated in Fig. 1, and adapted to be attached to the side rails of the frame by engagement with the pins R, and this platform is composed of a series of fingers S, through which the fingers of the carriers L are adapted to pass, as clearly illustrated in Fig. 4. The unloading-platform P is arranged slightly below the level of the upper surface of the carriers while in their horizontal position and has formed thereon the fingers T, through which the fingers of the carriers pass just prior to said carriers being deflected downward, as before set forth, the object of which arrangement is to permit the carriers to convey the load to the platform and then elevate it thereon automatically, and it is to be noted that the unloading-platform is of sufficient size to accommodate several workmen, whose duty it is to move the packages as deposited to the right and left, and thereafter they may be slid down suitable inclines to the floor of the warehouse or upon trucks, as the case may be. The carrier-chains are given their traveling motion by means of a worm-wheel U, which is mounted on the same shaft with the sprocket-wheels H, and this worm-wheel in turn receives its motion from a worm V, operated by any suitable motor W, here shown as an electric motor.

From this description the operation of my improvement will be obviously as follows: The vertical section of the frame being lowered within the hold of a vessel to be unloaded until the lower end thereof is supported by the legs X coming in contact with a portion of the cargo of the vessel—say from six to seven feet below the deck—the motor is put in operation to cause the carrier-chains to travel, and thereafter packages placed upon the platform Q will be picked up by the carriers passing therethrough and elevated to the horizontal section of the frame and then conveyed to the unloading-platform, where they will be deposited, as before set forth, and this operation will be continuous, since the carriers will each in turn pass around the sprocket-wheels H and back to the hold of the vessel, again performing their function of picking up and conveying packages which have previously been placed upon the platform Q. As the surrounding cargo is discharged, that immediately beneath the apparatus may be gradually removed until the legs X rest upon the bottom of the vessel. Thus without inconvenience of rehandling the cargo the entire contents of the vessel may be elevated and deposited in the warehouse, and this continuously without interruption or congestion at

any point, since the entire operations of the apparatus are automatic, requiring no attention upon the part of the operators except the placing of the packages upon the loading-platform and the removal of the same from the unloading-platform. It is likewise obvious that the reversed movement of the carrier-chains will cause the carrier to move in the opposite direction, thus enabling a vessel to be loaded by the apparatus, in which case the packages to be conveyed thereto would be placed upon the platform P and ultimately deposited upon the platform Q, from whence they would be removed by hand.

In practice the apparatus is handled by a suitable derrick, whereby the vertical section thereof may be readily inserted within the hold of the vessel and raised and lowered as desired. When the cargo of the vessel is in bulk, such as grain or coal, the buckets, (shown in Fig. 6,) which consist of the side bars Y and the scoop-section Z, are used in the place of the carriers, and when such buckets are used the loading and unloading platforms are dispensed with, since the movement of the buckets in passing around the sprocket-wheels C is such as to scoop up the coal or grain, and after conveying the same to the point *a'* the bucket will be tipped at such an angle as to dump its contents, and a suitable chute may be arranged for the reception thereof and its conveyance to the desired point.

Having thus fully described my invention, what I claim as new and useful is—

1. In a conveyer, a framework comprising sides formed of longitudinally-grooved rails, sprocket-chains running substantially parallel with the sides, rods extending between the chains, rolls on the rods running in the grooves of some of the rails, fingers journaled immediately on said rods, guide-rods connecting the rear ends of said fingers, said rods having rolls traveling in the grooves of the other of said rails, and platforms having fingers between which the first-named fingers pass, as and for the purpose described.

2. In a conveyer, a framework comprising the sides, each formed of the two outer grooved rails and the two inner guide-rails, two series of rods arranged in pairs, each having rolls on its extremities, one series traveling in the outer grooved rails and the other series in the guide-rails, fingers connecting the rods of each pair, platforms having fingers between which the first-named fingers pass, and means for causing said rods to travel in said rails, as and for the purpose set forth.

3. In an apparatus of the character described, a frame comprising four rails on each side having grooves therein, sprocket-wheels mounted at each end of the frame, endless chains traveling over said sprocket-wheels, a motor for causing the chains to travel, carriers pivoted to the chains, rolls carried by the carriers and adapted to travel in the



grooves of the frame, a loading-platform consisting of fingers through which the fingers of the carriers may pass, and an unloading-platform having fingers thereon through  
5 which the fingers of the carriers may pass, all arranged substantially as shown and described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

GAGE M. WHEELER:

Witnesses:

ALEXANDER REITH,  
F. R. WRIGHT.