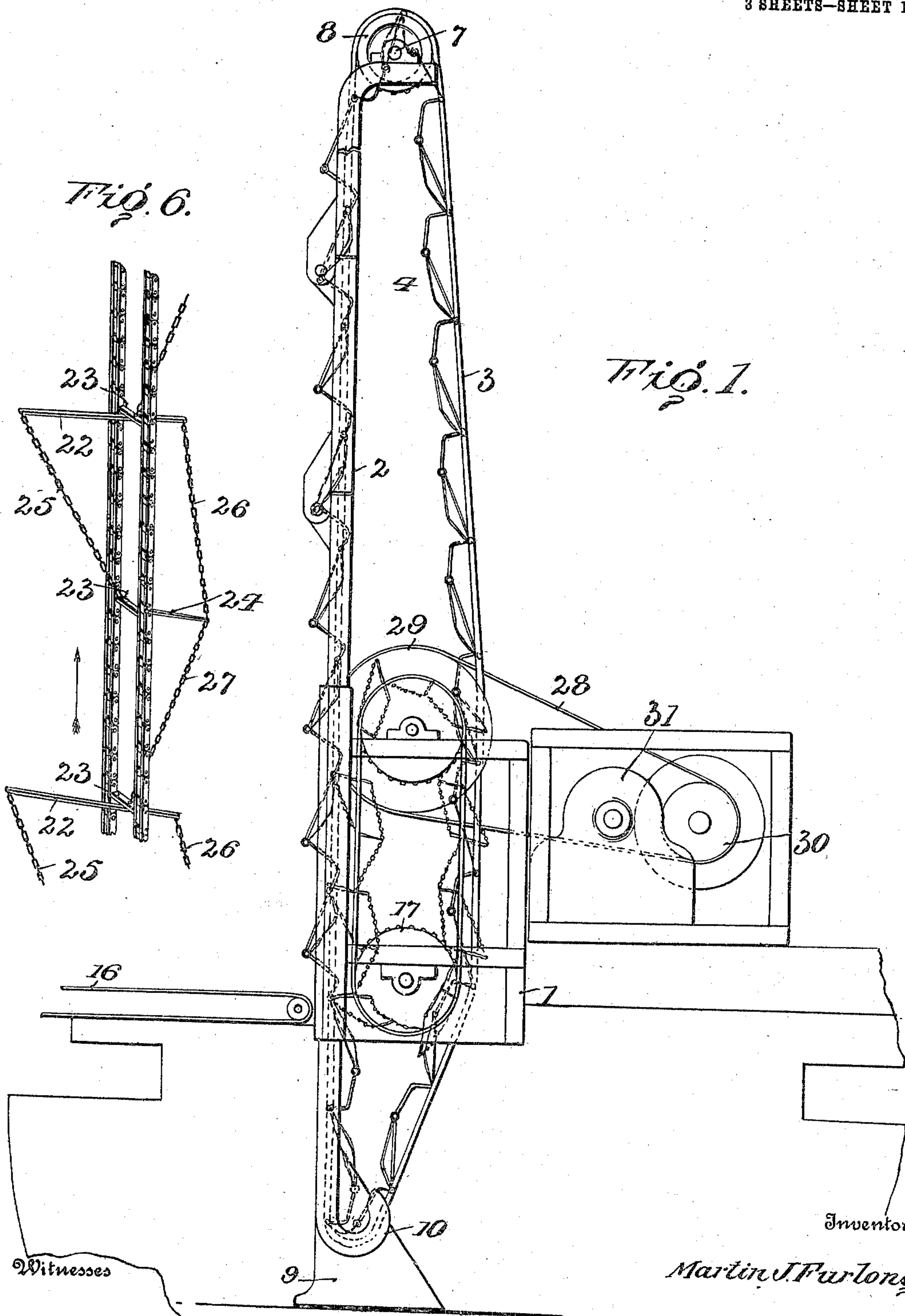


M. J. FURLONG.
MEANS FOR UNLOADING SHIPS.
APPLICATION FILED JAN. 30, 1909.

957,878.

Patented May 17, 1910.

3 SHEETS—SHEET 1.



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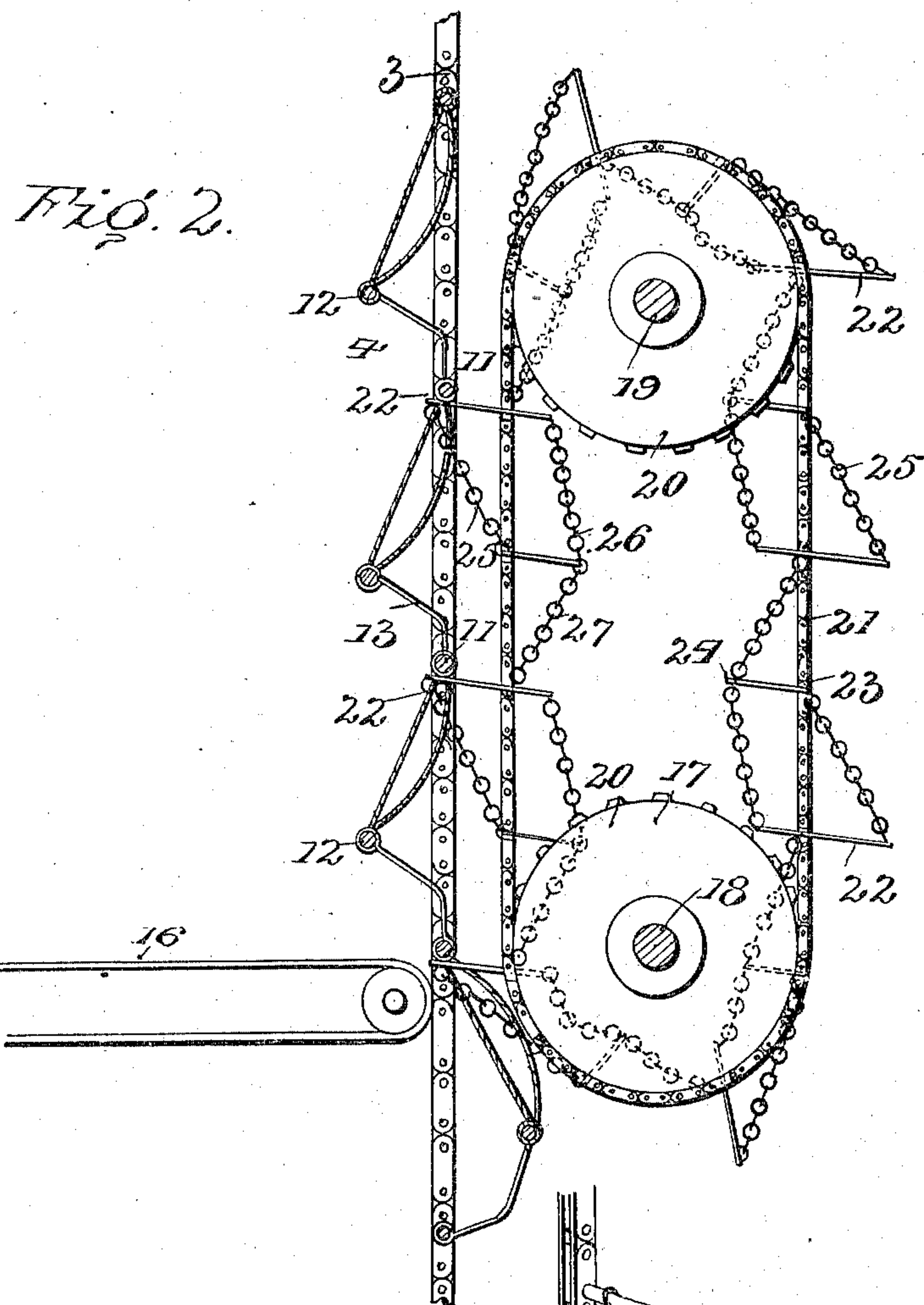
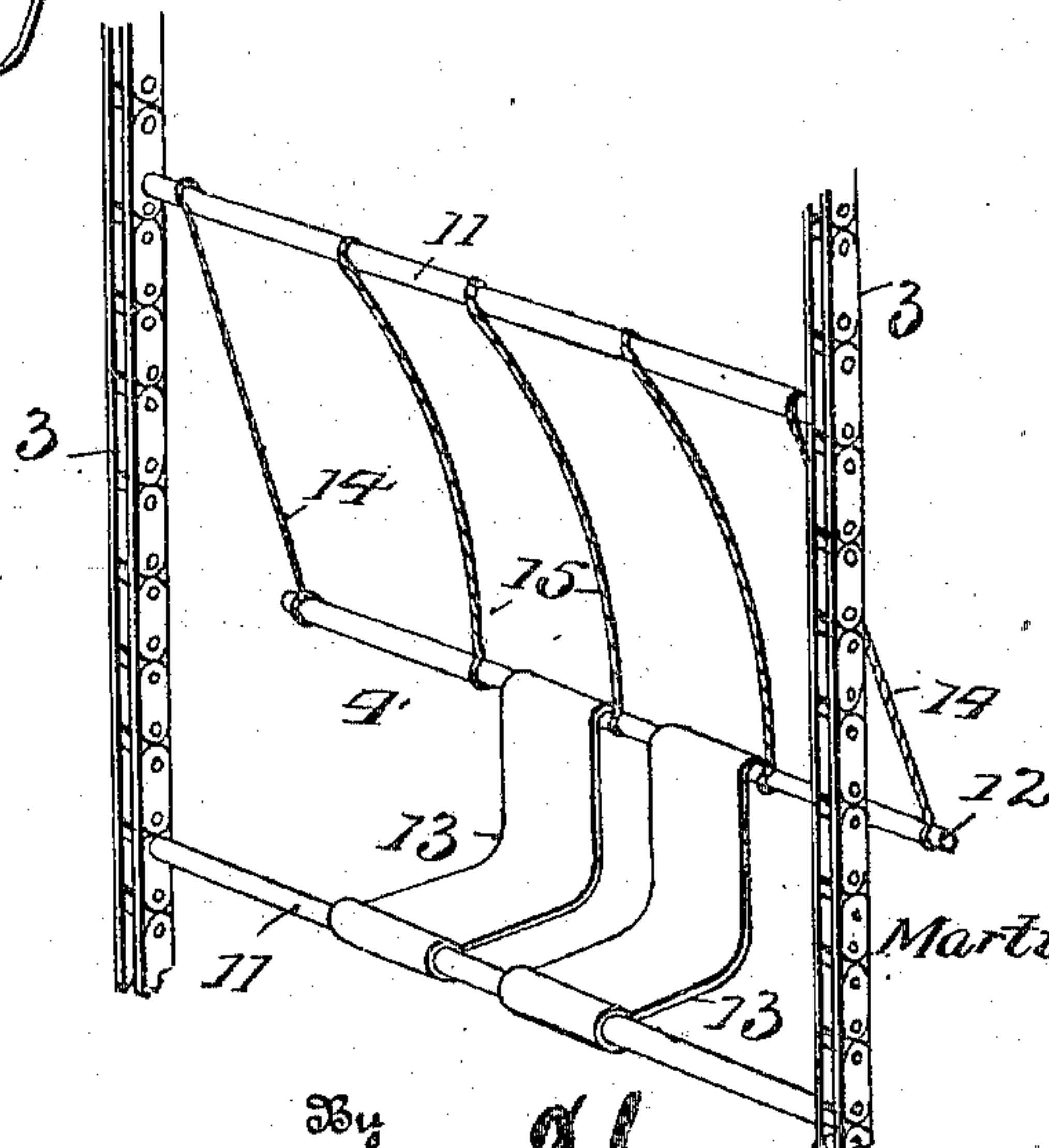


Fig. 5.



Witnesses

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Fig. 3.

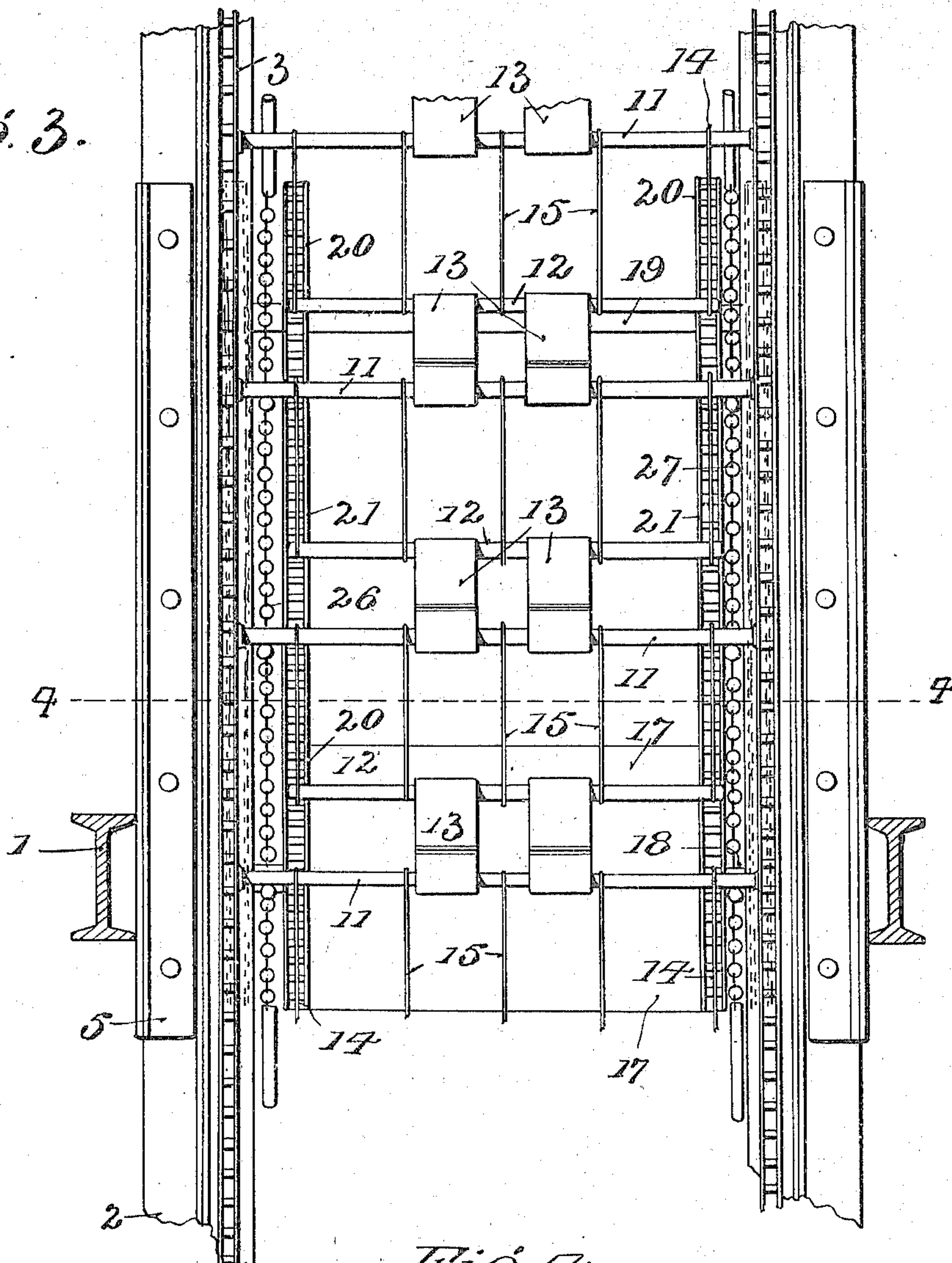
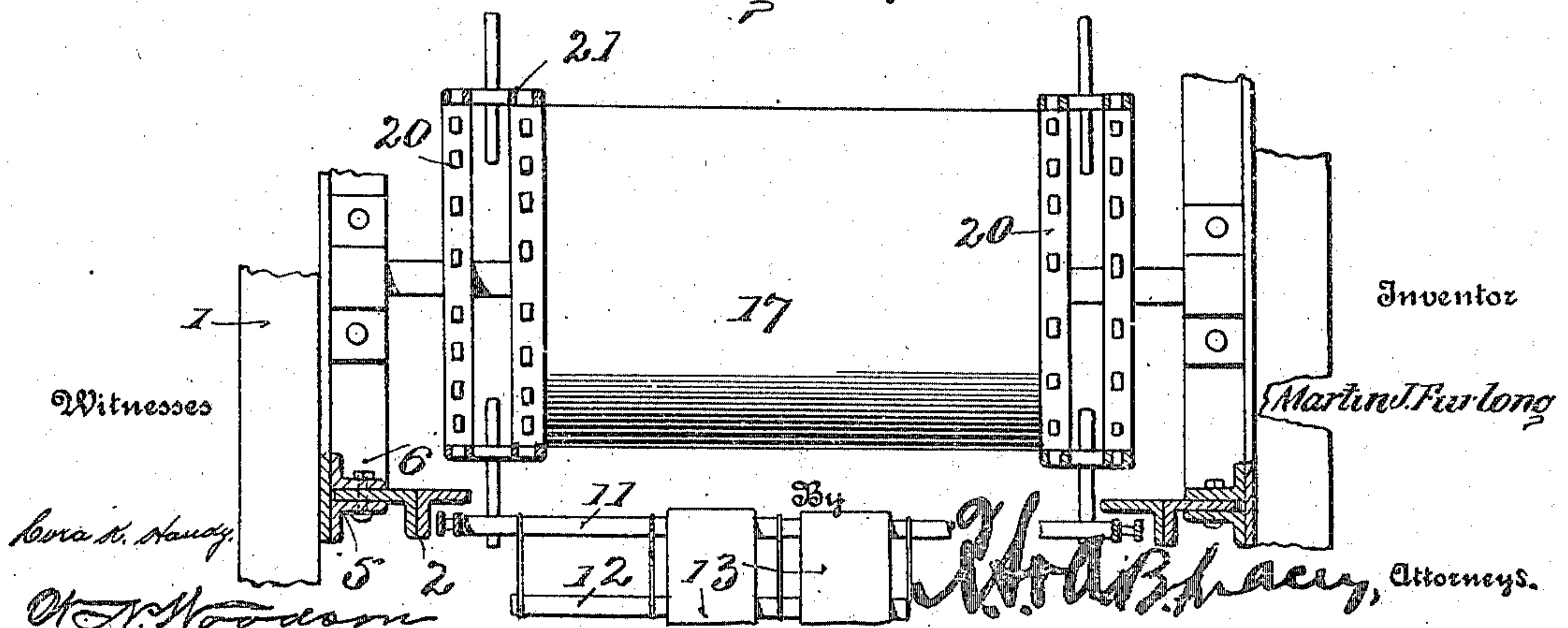


Fig. 4.



UNITED STATES PATENT OFFICE.

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MEANS FOR UNLOADING SHIPS.

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To all whom it may concern:

Be it known that I, MARTIN J. FURLONG, citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Means for Unloading Ships, of which the following is a specification.

This invention supplies an elevator of novel structure intended chiefly for lifting merchandise from the holds of merchantmen and automatically delivering the goods upon a carrier to be conveyed to the required point of discharge, which is portable and readily adjustable as to depth for convenience of receiving the merchandise during the unloading operation, and which is effective and capable of being driven by the expenditure of a minimum amount of energy and positive and certain in results.

The appliance comprises in its organization a vertically adjustable elevator, a portable framework supporting the elevator, actuating gear mounted upon the framework for operating the elevator, means for effecting automatic delivery of the goods from the baskets or load carriers of the elevator and driving gear for the elevator actuating gear.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side view of an unloading appliance or portable elevator constructed in accordance with and embodying the essential features of the invention; Fig. 2 is a sectional view of a portion of the elevator, the elevator actuating gear and a portion of the conveyer, the parts being illustrated on a larger scale; Fig. 3 is a front view of the parts shown in Fig. 2; Fig. 4 is a horizontal section on the line 4—4 of Fig. 3; Fig. 5 is a detail perspective view of a basket or load carrier; and, Fig. 6 is a detail perspective view of a portion of the elevator actuating gear.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The unloading appliance comprises a framework 1 which may be of any desired construction according to the design and

general character of the elevator. The framework is constructed with a view to strength and portability to provide a substantial structure and permit of the same being conveniently moved from place to place or from one ship to another.

The elevator proper is mounted upon the framework 1 and is vertically adjustable and also constructed to be lengthened or shortened to adapt the same to the work, as the latter progresses in the unloading of the vessel. The elevator comprises a frame 2 and an endless carrier, the latter comprising endless chains 3 and baskets or load carriers 4. The elevator frame 2 is composed of sections which are adapted to be bolted or otherwise secured, thereby admitting of the elevator frame being lengthened or shortened to suit the depth from which the merchandise is being lifted. The endless carrier is also of such construction as to admit of a portion being removed or inserted to adapt the endless carrier to the length of the elevator frame.

As clearly indicated in Fig. 4, the elevator frame 2 is formed of two angle bars placed with a wing or flange of each together and made secure by rivets, bolts or like fastening means, thereby providing a strengthening rib.

The main frame 1 is provided with a pair of vertically arranged angle bars 5 which are spaced apart to receive the outer edge portion of the elevator frame, thereby forming a guide therefor. A pair of angle bars is provided at each side of the main frame. When the elevator is adjusted to the required point it is made secure by passing bolts or pins 6 through coincident openings formed in the guide bars 5 and the outer edge portions of the side bars forming the elevator frame 2. The upper end of the elevator frame is bent rearward and supports a shaft 7 upon which is mounted sprocket wheels 8 over which pass the endless chains 3. The lower end of the elevator frame is provided with a foot 9 and with guides 10 to give proper direction to the lower ends of the endless chains 3.

The endless carrier constituting the movable portion of the elevator is arranged so that its front portion travels upward and the rear portion downward. The endless chains 3 upon the ascending side are supported by portions of the elevator frame, as indicated most clearly in Fig. 4. Rods or

bars 11 connect the endless chains and are regularly spaced and form parts of and support the baskets or load carriers. Other rods or bars 12 are located intermediate of the rods or bars 11 and are loose and are shorter than the distance between the endless chains 3, so as to have free play between said endless chains. Bent plates or elements 13 have loose connection at opposite ends with the rods 11 and 12 and form the baskets or load carriers. Flexible stays 14 and 15 connect the rods 12 with the rods 11 next above, as indicated most clearly in Fig. 5. The stays 14 and 15 may consist of cord, rope or straps to admit of the rods 12 moving forward and backward across the plane of the endless chains 3. The outer stays 14 are shorter than the intermediate stays 15, hence are taut at all times. The intermediate stays 15 serve more in the nature of guards to prevent a package passing over the basket or load carrier when thrown upon the elevator in the operation of the device. The baskets or load carriers automatically assume the position shown in Fig. 5, so as to receive the load when supplied thereto.

It is to be understood that the lower portion of the elevator extends into the hold of the ship a convenient distance to receive the packages, the endless carrier being continuously driven. As the baskets or load carriers move upward and reach a position about level with the deck of the ship the load is automatically discharged from the baskets and received upon the conveyer 16 by means of which the goods are conveyed to the desired point of discharge, whether upon shore or to a lighter or other place. The goods are discharged from the baskets by means of a drum 17, the latter being arranged so as to intersect the baskets and press the same forward with the result that the load is discharged therefrom, as indicated most clearly in Fig. 2. The drum 17 is mounted upon a shaft 18 journaled at or near its ends in bearings applied to the framework 1.

The elevator actuating gear comprises an upper shaft 19 and lower shaft 18, pairs of sprocket wheels 20 mounted upon end portions of the shafts 18 and 19, pairs of endless chains 21 mounted upon the sprocket wheels 20, lifting bars 22 and stays connecting said lifting bars with the endless chains. The pairs of chains 21 are connected at regular intervals by cross bars 23. Every other cross bar is provided with a lifting bar which is pivoted thereto to hold it in given position. The intermediate cross bars have stay bars 24 attached thereto. The lifting bars 22 are mounted upon the cross bars 23, so that the end portions projecting in front of the endless chains 21 are longer than the end portions extending in the rear of said endless chains. The stay bars 24

extend inward. Stay chains 25 connect the outer ends of the lifting bars 22 with the intermediate cross bars 23 to which the stay bars 24 are attached. Stay chains 26 connect the rear ends of the lifting bars 22 with the inner or rear ends of the stay bars 24 and other stay chains 27 connect the inner or rear ends of the stay bars 24 with the next cross bars 23. The stay chains 26 and 27 may be separated or formed of a single length. The several stays 25, 26 and 27 may be of any flexible material to admit of the endless chains 21 passing around the sprocket wheels 20, as indicated most clearly in Fig. 2. The lifting bars 22 normally incline to the horizontal and their outer or forward ends are adapted to engage with the rods or bars 11 of the endless carrier and impart movement to the latter. The upward and forward inclination of the lifting bars prevents the slipping of the rods or bars 11 therefrom on the up side of the endless carrier. The distance between the lifting bars corresponds to the distance between the rods 11, so that the lifting bars of the elevator actuating gear may engage successively with the rods 11 of the endless carrier, as indicated most clearly in Figs. 1 and 2. When the lifting bars reach the limit of their upward movement and begin to pass over the upper sprocket wheels 20, the vertical distance between the uppermost two cross bars 23 decreases, and the lifting bars being pivotally mounted on the cross bars, the forward ends of the top lifting bars will drop slightly, so as to clear the rod or bar 11, thereby preventing any drag on said lifting bars, which would tend to impede their rearward movement.

In the operation of the appliance motion may be imparted to either of the shafts 18 or 19 to operate the elevator actuating gear. As shown, a drive belt 28 connects a pulley 29 fast to the shaft 19 with a pulley 30 fast to a shaft geared to the shaft of a motor 31 mounted upon the framework 1 and of any design or type. By having the several sprocket chains passed around sprocket wheels the said chains are driven uniformly, hence the cooperating parts maintain a fixed relative position.

When it is required to unload a vessel the framework 1 is secured over the hatchway and the elevator is adjusted so that the lower portion extends into the hold a distance to conveniently receive the goods or merchandise. The motor being set in operation drives the elevator actuating gear, and the endless chains 21 in their travel, cause the lifting bars 22 upon the ascending side to engage in successive rotation with the rods or bars 11 of the endless carrier, thereby imparting movement to the latter. As the baskets or load carriers come into position at the lower end of the elevator to receive

the load the packages are thrown therein. As the baskets reach the level of the deck they come in contact with the drum 17 which moves the baskets forward, thereby effecting a dumping of the goods therefrom on to the conveyer 16. By having the flexible stays 15 longer than the flexible stays 14 the former are enabled to conform to the curvature of the dumping drum 17 and thereby receive the force initially expended to cause automatic ejection of the load from the baskets. As the hold of the ship is emptied the elevator is lowered and when required it may be lengthened by the addition of sections thereto both of the elevator frame and the endless carrier.

Having thus described the invention what is claimed as new is:

1. In a device of the class described, an endless carrier, an actuator therefor comprising an endless member, lifting bars pivoted at intervals in the length of the endless member and adapted to engage in successive rotation with the endless carrier, stays spaced from the lifting bars, flexible elements connecting the stays and adjacent lifting members, and other flexible elements connecting the stays with said endless member.

2. In a device of the class described, an endless carrier, actuating means therefor consisting of an endless chain, lifting members located at intervals in the length of the endless chain and adapted to engage the endless carrier, stay members secured to the endless chain intermediate the lifting members, flexible stays between the lifting members and the adjacent stay members, and other flexible stays between said stay members and the endless chain.

3. In an appliance of the character specified comprising an endless carrier, an endless chain, lifting bars located at regular intervals in the length of the endless chain, stay bars connected to the endless chain intermediate of the lifting bars, and flexible stays between the lifting bars, stay bars and endless chain.

4. In a device of the class described, an endless carrier, an endless chain, lifting members attached to the endless chain at intervals and inclined upwardly and forwardly at their outer ends upon the ascending side of the endless chain, stay members secured to the endless chain intermediate the lifting members, flexible elements connecting the stay members with the adjacent lifting members, and other flexible elements forming a connection between said lifting members and the endless chain.

5. In an appliance of the nature described

comprising an endless carrier, a pair of spaced endless chains, supports therefor, cross bars connecting the endless chains, lifting members mounted upon every other cross bar, stay bars mounted upon the intermediate cross bars, and flexible stays connecting the several lifting and stay bars with one another and with the endless chains.

6. In a device of the class described, an endless carrier provided with spaced relatively fixed rods and an intermediate movable rod of less length than the fixed rods, and flexible connections between the fixed and movable rods, said rods and flexible connections constituting a load carrier.

7. In an appliance of the nature described the combination of endless chains, rods or bars connecting said endless chains, other rods intermediate of the rods or bars attached to the endless chains and free to move across the plane of the endless chains, load carrying means connecting the loose rod or bar with the relatively fixed rod or bar immediately below, and stays connecting said loose rod or bar with the relatively fixed bar next above.

8. In an appliance of the nature described the combination of endless chains, rods or bars connecting said endless chains, other rods intermediate of the rods or bars attached to the endless chains and free to move across the plane of the endless chains, load carrying means connecting the loose rod or bar with the relatively fixed rod or bar immediately below, and a series of flexible stays connecting said loose rod or bar with the relatively fixed rod or bar next above, the outer stays being shorter than the intermediate stays.

9. In a device of the class described, a vertically adjustable elevator comprising a frame, an endless carrier, the latter being provided with load carriers, actuating means for the endless carrier comprising an endless chain having spaced lifting members, stay members secured thereto, flexible connections between the outer ends of the lifting members and the endless chain, and flexible connections between the inner ends of the lifting members and the adjacent stay members, said lifting members being adapted to engage successively with said endless carrier.

In testimony whereof I affix my signature in presence of two witnesses.

MARTIN J. FURLONG. [L. s.]

Witnesses:

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PAUL B. HABANS.