

A. W. LIND.

CONVEYER.

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905,337.

Patented Dec. 1, 1908.

Fig. 1.

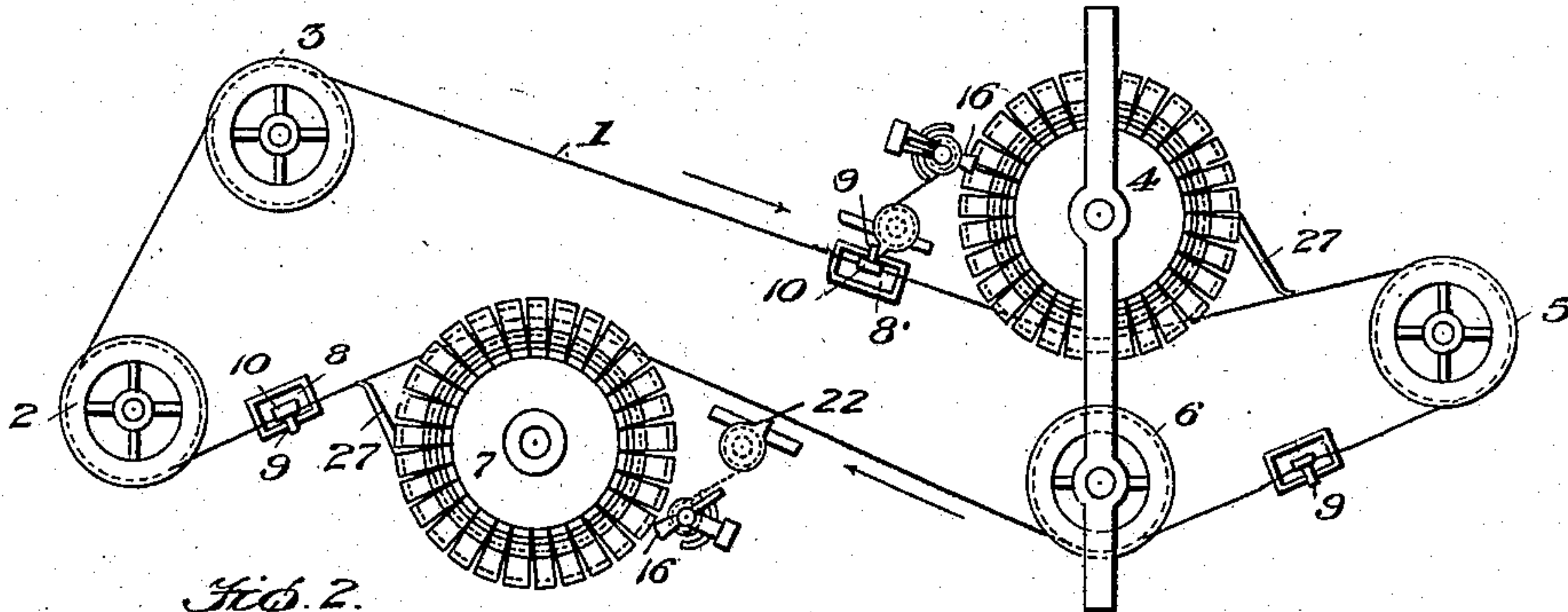


Fig. 2.

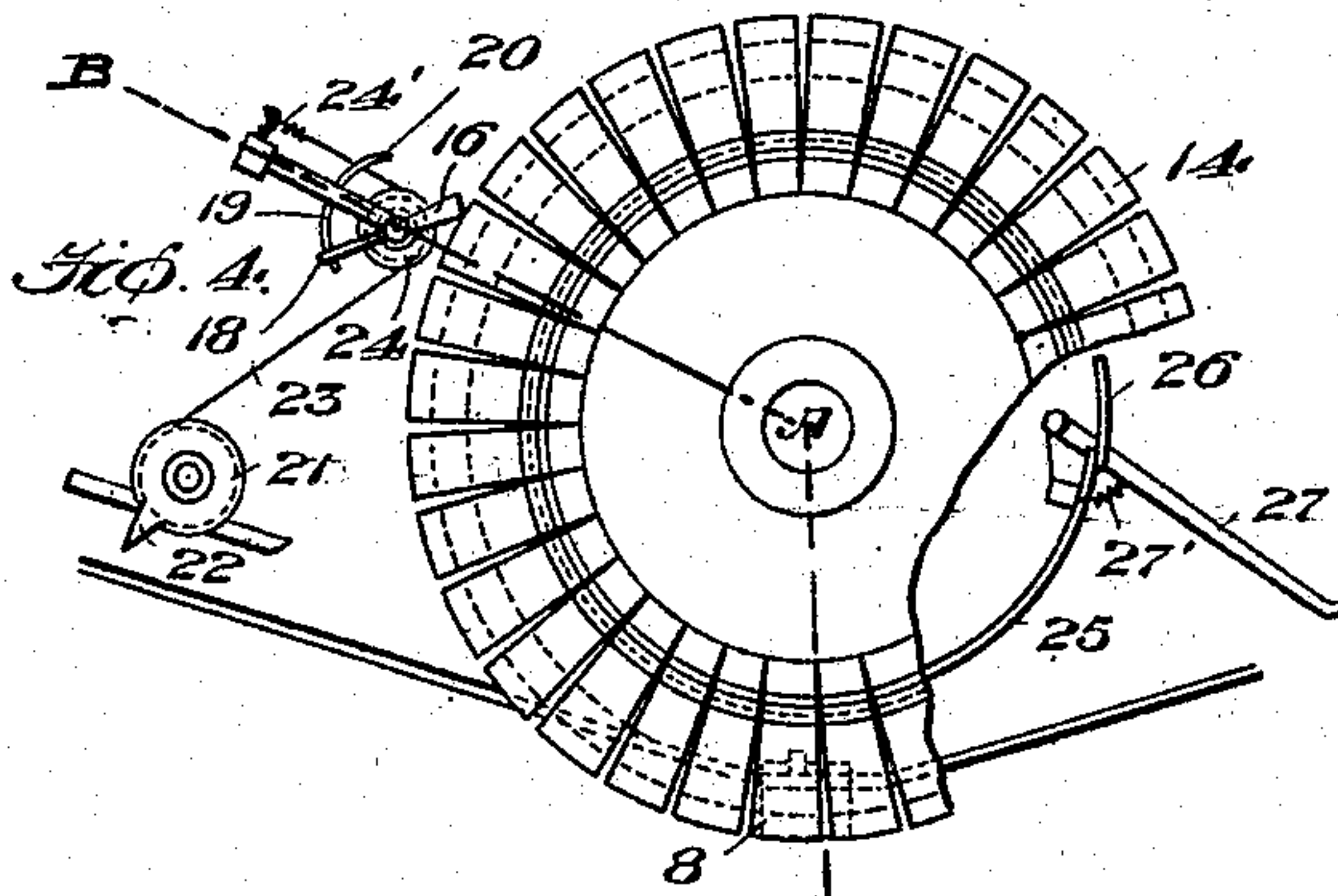
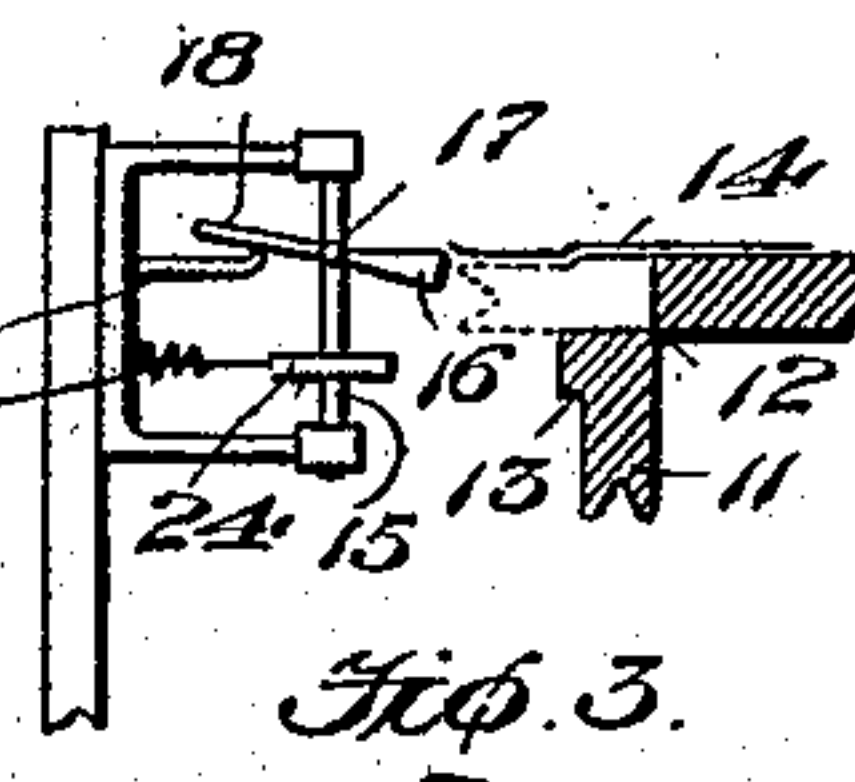
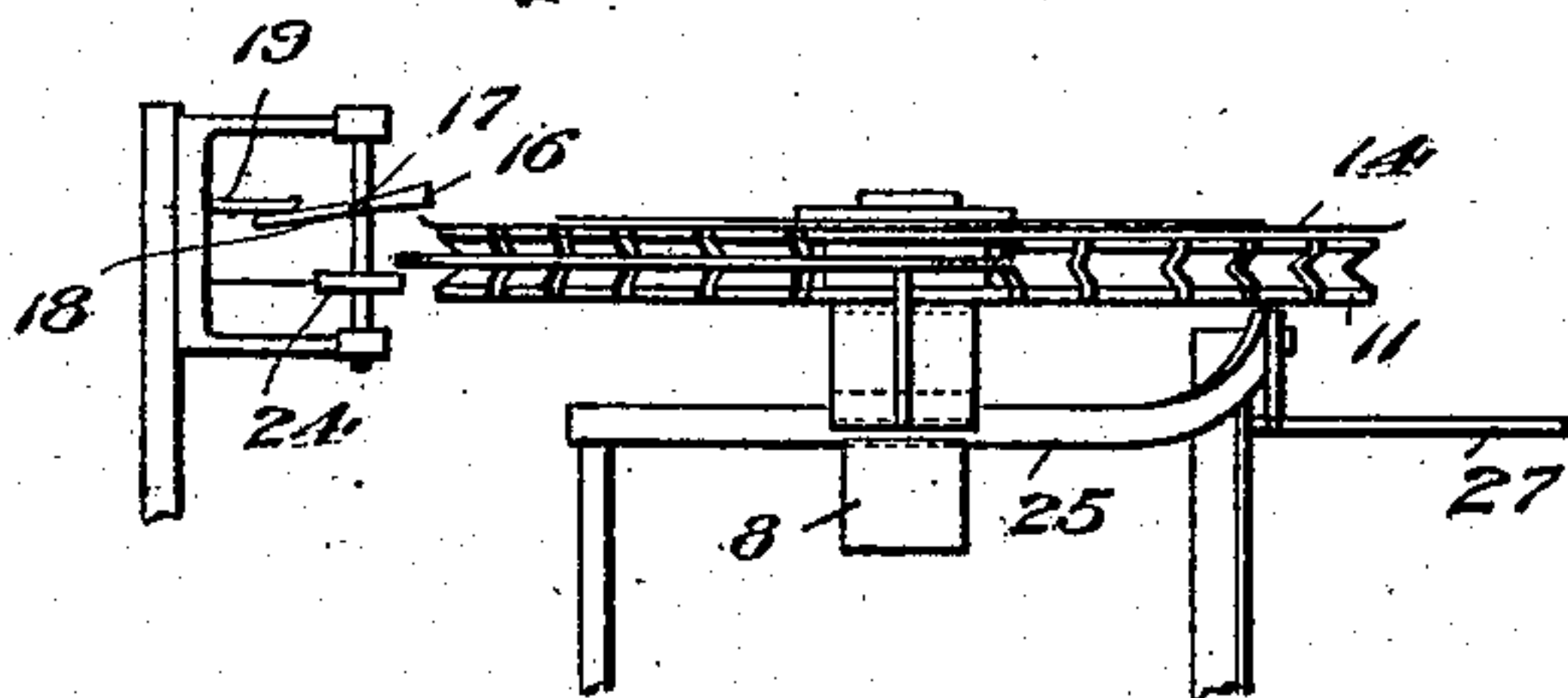


Fig. 5.

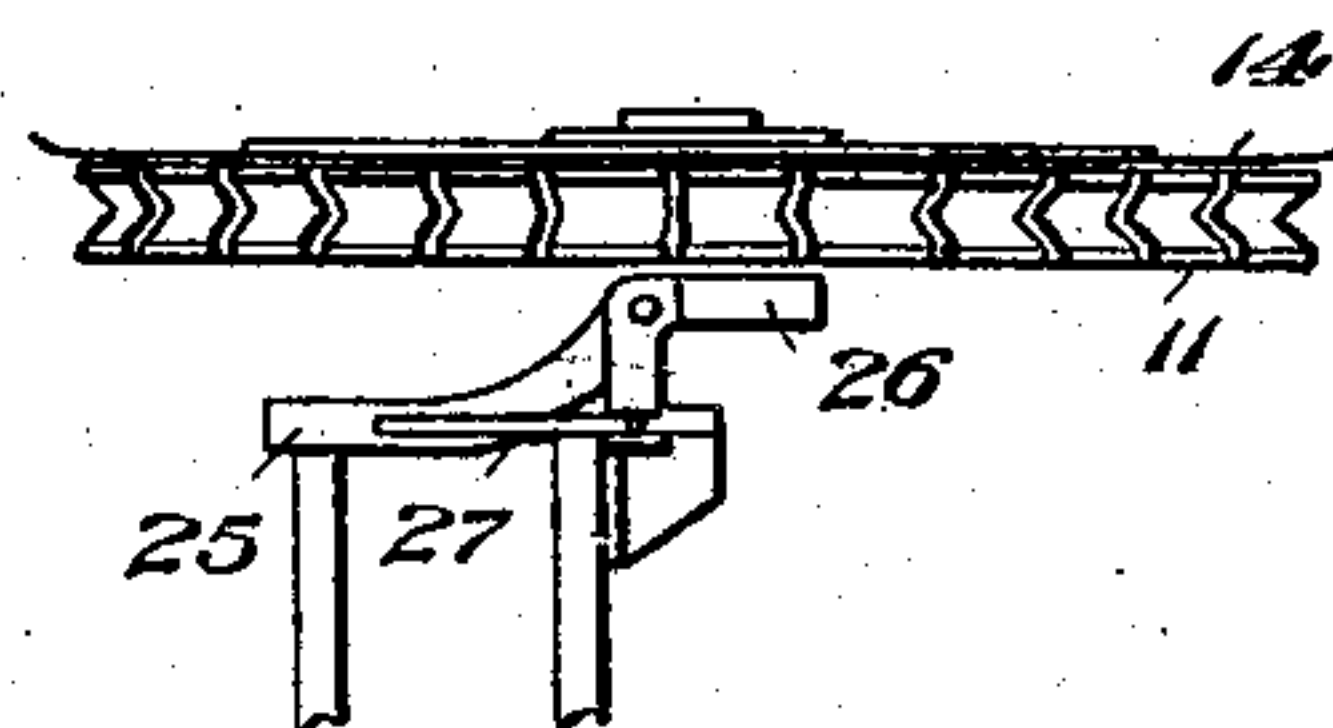


Fig. 6.

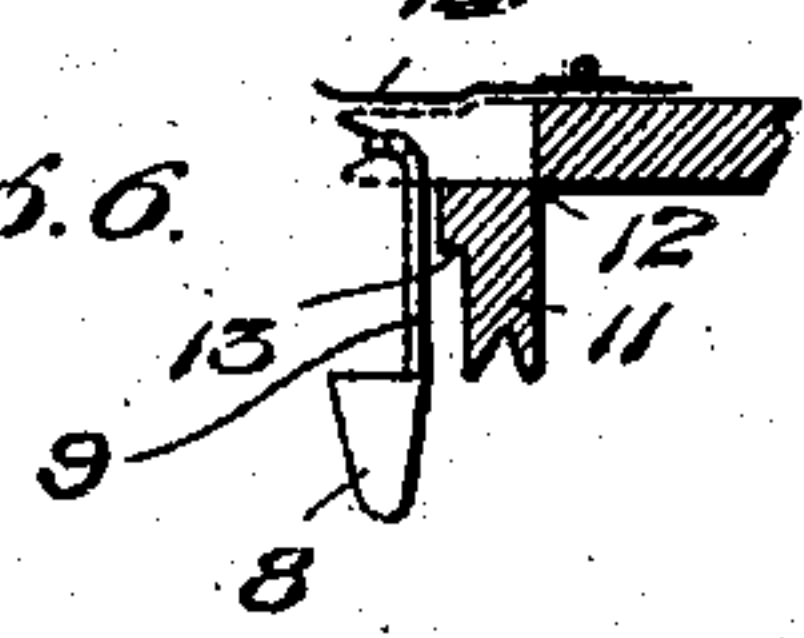
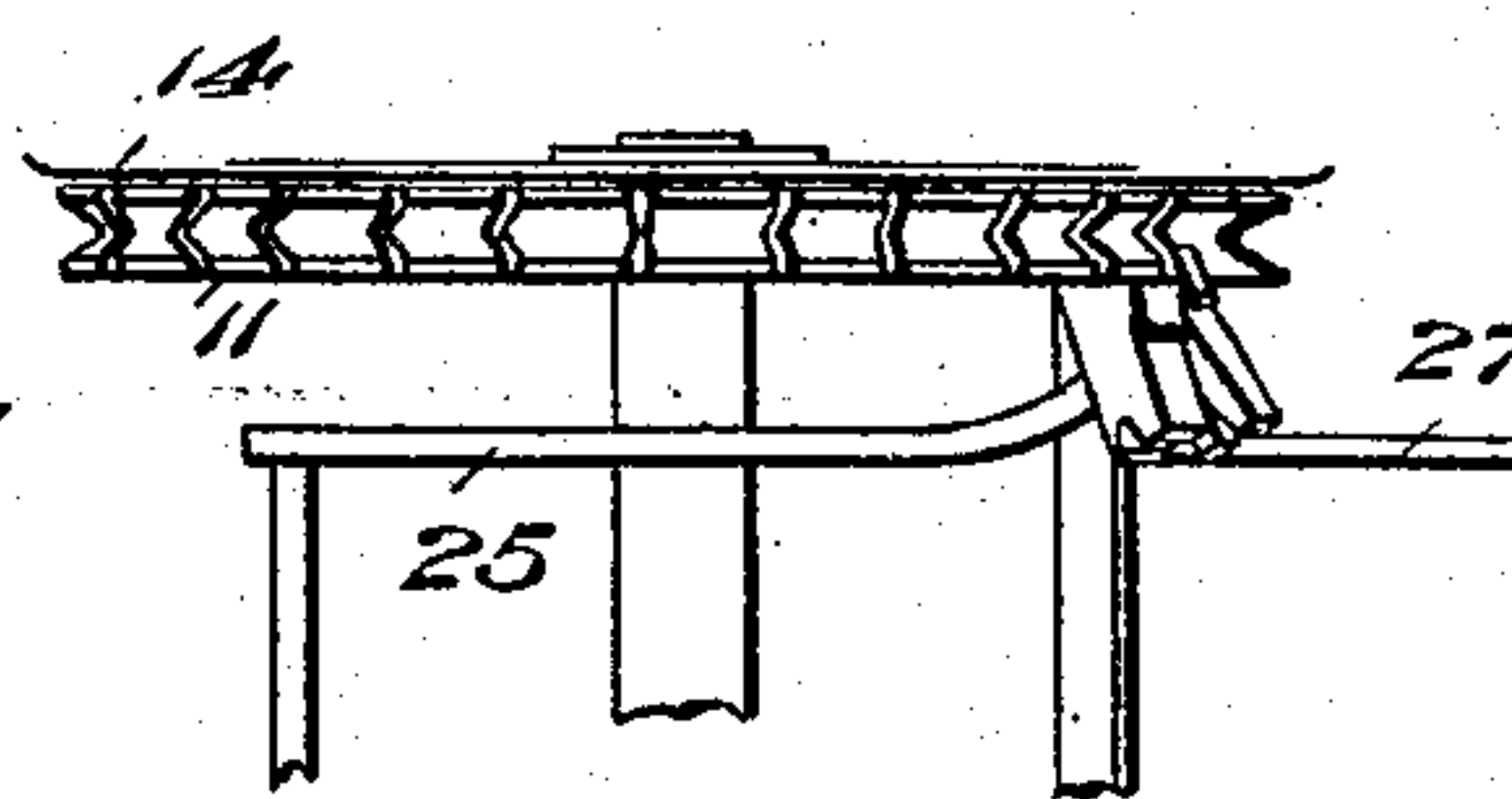


Fig. 7.



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# UNITED STATES PATENT OFFICE.

AXEL WALDEMAR LIND, OF STRÖMSTAD, SWEDEN.

## CONVEYER.

No. 905,337.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed June 17, 1908. Serial No. 439,014.

*To all whom it may concern:*

Be it known that I, AXEL WALDEMAR LIND, citizen of the United States, residing at Strömstad, Sweden, have invented new and useful Improvements in Conveyers, of which the following is a specification.

My invention relates to conveyers or cable-tracks by which buckets or carriers are transported along a suspended endless wire or cable, which is bent around and driven through wheels with vertical shafts.

The object of my invention is to produce a construction for conveyers of this type, which can be carried around horizontal curves even on that side of the track, where the overhanging arms of the carriers are extending outwards, without said arms interfering with the rim of the guide-pulleys.

The characteristic of the invention therefore is that the rim of the guide-pulleys on the overhanging side is radially divided into a number of hinged doors, which include the rope-groove, and which are dropped in the same moments, as the overhanging-arm of a carrier passes, rendering said arm a free passage.

Referring to the accompanying drawing Figure 1 is a plan view of my improved conveyer. Fig. 2 is a side elevation of a part of same. Fig. 3 shows a similar side view with a part of the guide-pulley in section through the line A—B of Fig. 4. Fig. 4 shows a plan view of my improved apparatus, partly in section. Fig. 5 is a side view of the guide-pulley perpendicular to the line A—C of Fig. 4, and Fig. 6 a section of same through the line A—C. Fig. 7 finally shows a front view of my improved guide-pulley in a different working-position. Figs. 2 to 7 are on a larger scale than Fig. 1.

An endless rope, wire or chain 1 is run in so many horizontal curves or bends as necessary and is suspended over the ground on horizontal and vertical guide-pulleys 2, 3, 4, 5, 6 and 7. The carriers 8 are at suitable intervals attached to the rope or wire 1 by an overhanging arm 9, which is connected to the rope or wire 1 through a socket 10, of a diameter only a little larger than the rope or wire in order to suit the grooves of the guide-pulleys 2, 3, 5 and 6. The pulleys 2 and 5 at the end points of the conveyer serve as driving-wheels. At such points, where the track must be curved to that side, where the arms 9 are hanging over, the rims of the guide-pulleys 4 and 7 are radially di-

vided into doors 11, attached to the underside of the pulleys through hinges 12 so that they can be dropped down in vertical position. These doors include in their outer edges the rope-grooves. They are each on their upper side provided with a hook 13, which, the doors being in horizontal position, grasps into a corresponding hook on a hinged plate 14, placed one over each door 11, on the upper side of the pulley, which plates 14 are reaching a little outside the edges of the doors 11. The swing axles of the plates 14 are preferably situated somewhat inside the edge of the solid part of the pulley to prevent the plates 14 from falling down under a horizontal position, when the corresponding door 11 is dropped.

At the side of each pulley 4 and 7 is a device for the dropping of the doors 11, consisting of an inclined plate 16, turnably mounted on a vertical shaft 15. Said plate is of such a length, that it reaches under the edge of the plates 14 without touching the doors 11. The plate can also be somewhat pivoted in vertical direction on horizontal journals 17, arranged on the shaft 15, and it is provided with an arm 18, which projects on the opposite side of the shaft. On the rear side of the shaft 15 in relation to the pulley there is a curved rail 19 with its one end 20 bent somewhat upwards. The purpose of said rail is to lift the plate 16 over the plates 14, when turning in the one direction, so that the plate 16 does not interfere with the latter during this motion. The arm 18, when turned to its outer position at the end 20, becomes caught by this upward turned end of the rail 19 and pushed downwards under the rail, when turning back to the rear end of same one, thus keeping the edge of the plate 16 so high, that it comes out of contact with the plates 14. Having passed along the underside of the rail 19, the arm 18 becomes free, and then the plate 16 by its gravity falls down so far that, if now turned back to the former position by the arm 18 above the rail, its lower, leading edge comes in under the edge of one of the plates 14 and raises same one a little through the inclined position of the plate 16.

The arm 18 is either moved automatically by the carriers through an arm 22 extending from a rope-pulley 21, pivotally arranged on the side of the track. Said arm becomes touched by the overhanging arm 9 of the carriers and swung out of the way making



a free passage for the arm 9. This movement of the arm 22 and the pulley 21 is transmitted to the shaft 15 by a rope 23, fixed to the pulley 21 and run over a second rope-pulley 24 on the shaft 15. A spring 24' at the end of the rope 23 tends to swing the pulley 24 and the arm 22 back into their original position since the carrier has passed away.

The position of the arm 22 and plate 16 is chosen so that the linear distance between that point, where the conveying-wire 1 touches the rim of the guide-pulley and that point, where the carrier's arm 9 touches the arm 22 equals the part of the guide-pulley's periphery between that point, where the plate 16 touches one of the plates 14 and that point, where the wire, as before said, touches the rim of the guide-pulley, in order to enable the overhanging arm 9 to engage with that recess in the rim of the guide-pulley, which is formed through the dropping down of one or a couple of the doors 11.

The guide-pulley having been turned in such a degree to permit the overhanging arm of the carrier to pass, the dropped doors are swung up again in their original position by a guide-iron 25, placed under the pulley and which guide-iron at the rear end is bent upwards to an inclined plane, on which the hanging doors are sliding. The highest point of that guide-iron does not reach close up to the pulley or the doors in order to prevent any useless wear of these parts at the revolving of the pulley. A bell-crank-lever 26 raises finally the doors sufficiently high to enable their hooks 13 to seize the hooks on the corresponding plates 14. The one arm of said lever is horizontal and placed close into the highest point of the guide-iron 25 at the same height as this one, and the other arm vertically and pivotally connected to a horizontal pivotally arranged lever 27, which reaches near to the rope or wire 1, so that it becomes moved by the overhanging arm 9 of a carrier when passing. A spring 27' tends to pull the lever 27 back to its original position, since the carrier has passed away. Vertical guides are suitably placed on each side of the guide-pulleys 4 and 7 to support the rope or wire 1 and to prevent the doors from being clapped down by the mere gravity of the rope or wire.

My improved conveyer works in the following way. The wire or rope 1 is driven in the direction of the arrows in Fig. 1. When a carrier arrives to the arm 22, this arm is moved away by the overhanging arm 9, which movement is transmitted through the rope 23 to the inclined plate 16, turning same towards the rim of the corresponding guide-pulley, so that one of the plates 14 becomes raised a little and drops the corresponding door 11. In passing the guide-

pulley the overhanging arm 9 now enters into the recess produced by the dropped door (Fig. 2). During the continued revolving of the pulley 4 resp. 7 the dropped doors are sliding along the guide-iron 25 and finally raised into nearly horizontal position through the inclined end of said guide-iron. Passing the end of the lever 27 the carrier moves it a little to the side, the bell-crank-lever is actuated and its horizontal arm finally lifts the door, until the hook 13 of same one seizes the hook of the plate 14.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent, is—

1. In a rope- or wire-conveyer guide-pulleys with vertical shafts, the rims of which are radially cut into hinged doors, which in their outer edges include the rope-grooves of the pulleys, and means for dropping down one or more of said doors into a vertical position in order to make a free passage for the overhanging-arms of the carriers.

2. In a rope- or wire conveyer the combination of guide-pulleys with rims cut radially into hinged doors, hooks on the upper side of said doors, hinged plates with corresponding hooks arranged above said doors, an inclined swinging plate, which can be moved so that it raises said hinged plates, means for swinging said inclined plate, means for lifting up the dropped doors, after the carriers have passed.

3. In a rope- or wire conveyer guide-pulleys with rims radially cut into hinged doors, hooks on said doors, hinged plates with hooks, which keep the doors in a horizontal position, a swinging inclined plate to raise said hinged plates in order to release said doors, said inclined plate fixed on a pivotally arranged shaft, a rope-pulley on said shaft, a second rope-pulley on the side of the rope- or wire track, an arm on said second pulley, which reaches to the rope- or wire track, a rope fixed to the second pulley and run around the pulley on the pivotally arranged shaft, a spring at the end of said rope.

4. In a rope- or wire conveyer guide-pulleys with rims radially cut into hinged doors, hinged plates with hooks to keep said doors, an inclined swinging plate to lift said hinged plates, horizontal journals fixed to the vertical shaft for the inclined plate, through which journals the inclined plate can be pivoted a little in a vertical direction, an arm on the rear end of the inclined plate, a curved rail, on which said arm is sliding, when moving in the one direction and then permitting the inclined plate to engage with the hinged plates on their underside in order to raise them, an upwards turned end of said rail, under which end the arm will take its way, when turned back to its former posi-



tion, thus lifting the inclined plate so, that same one does not interfere with the hinged plates.

5 In a rope- or wire-conveyer guide-pulleys with rims radially cut into hinged doors, hinged plates with hooks to keep said doors in a horizontal position, means for dropping said doors, a guide-iron arranged under the guide-pulley, on which guide-iron  
10 the dropped doors are sliding, when the pulley revolves, an upwards inclined end of said guide-iron in order to gradually lift the dropped doors up again to their horizontal position, a bell-crank-lever at the top of the  
15 inclined end of said guide-iron which bell-

crank lever finally lifts the doors until their hooks are seized by the hook in the hinged plates, a horizontal lever pivotally attached to said bell-crank-lever, which horizontal lever at the rear end reaches close to the rope- or wire track, so that it may be moved a little by a passing carrier. 20

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

AXEL WALDEMAR LIND.

Witnesses:

JOHAN. E. ANDERSSON,  
K. G. SKÄRSTRÖM.