

No. 883.297.

PATENTED MAR. 31, 1908.

W. E. COURTNEY.
GRAVITY FREIGHT CARRIER.

APPLICATION FILED SEPT. 17, 1907.

2 SHEETS—SHEET 1.

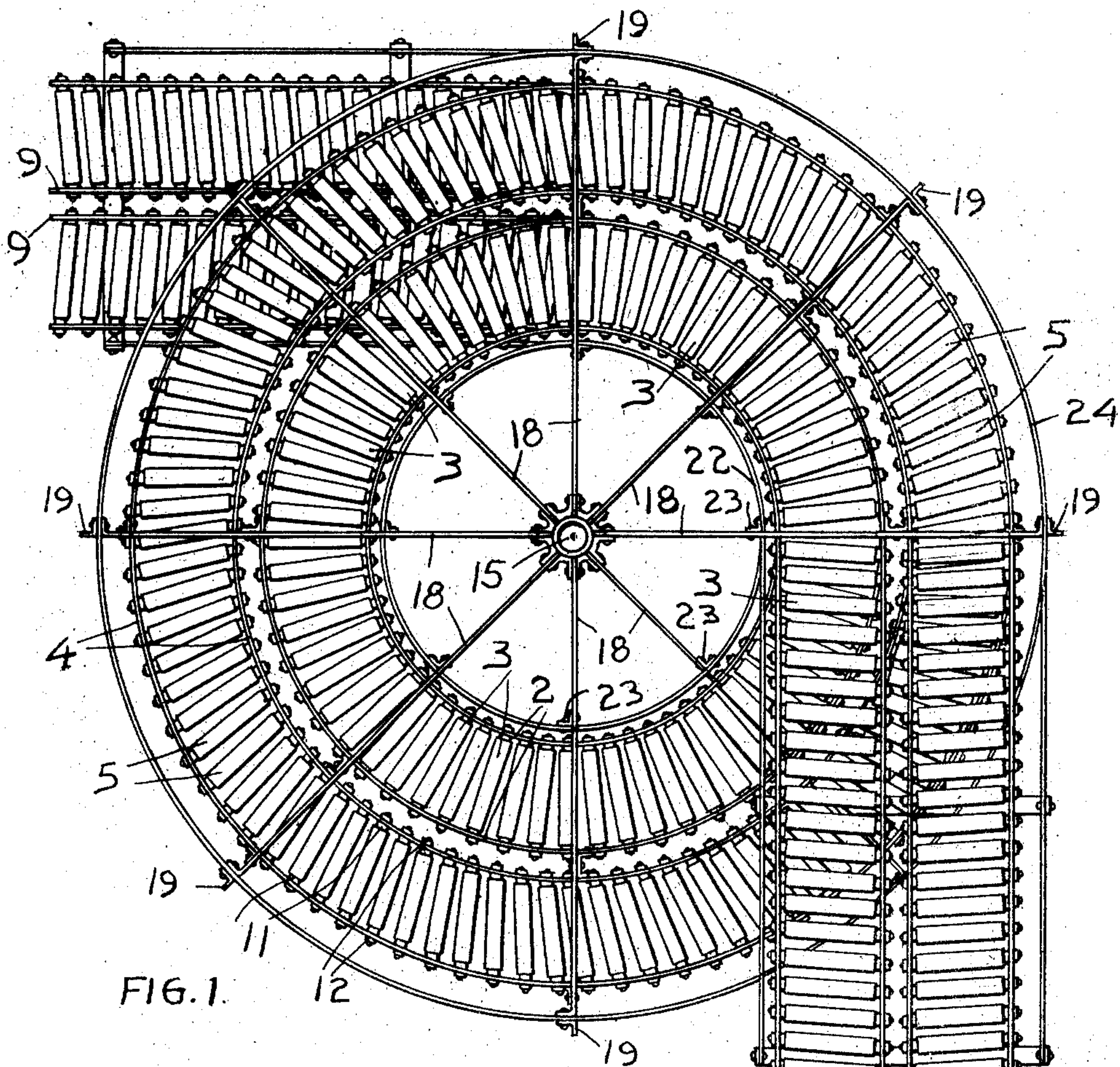


FIG. 1.

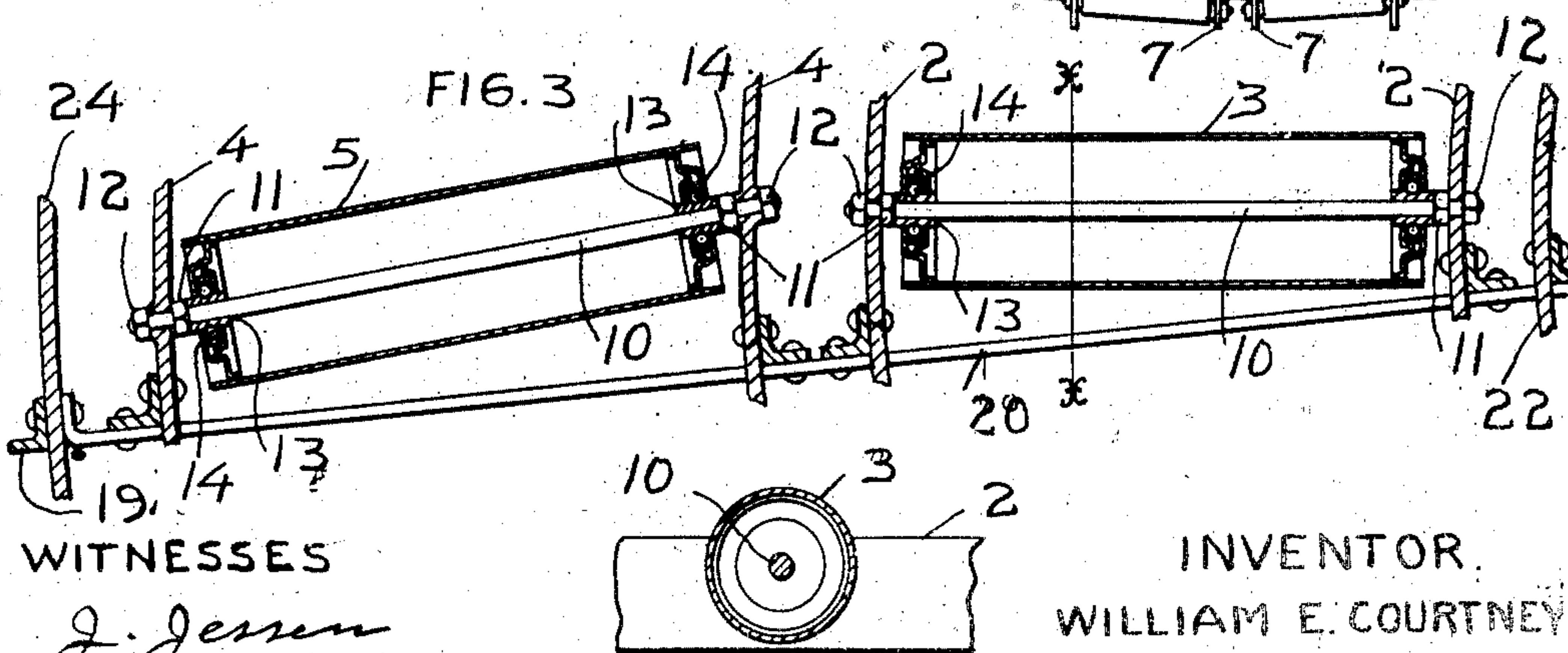


FIG. 3.

FIG. 4.

WITNESSES

J. Jensen
J. B. Bjington

INVENTOR
WILLIAM E. COURTNEY

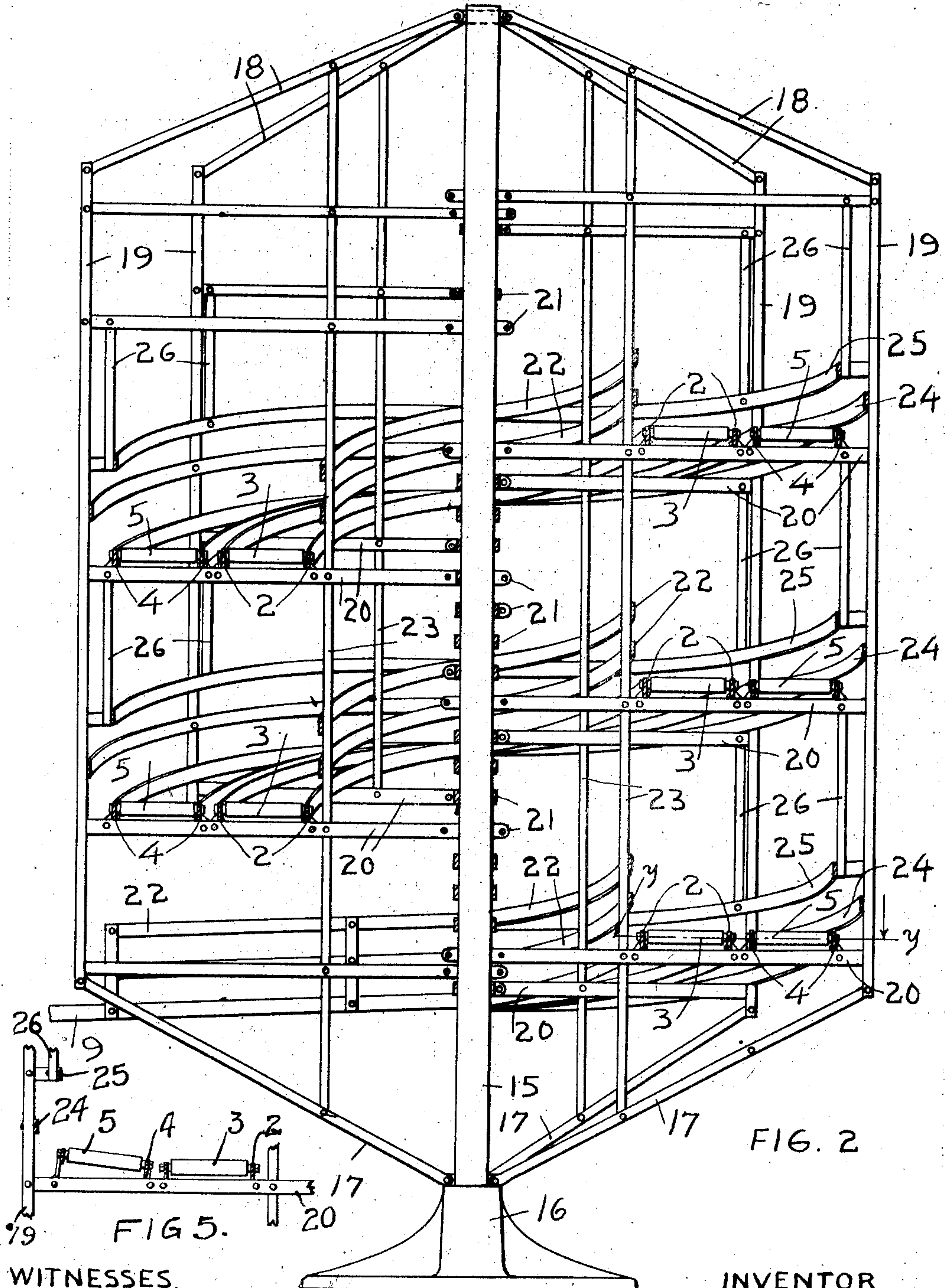
BY Paul & Paul
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UNITED STATES PATENT OFFICE

WILLIAM E. COURTNEY, OF ST. PAUL, MINNESOTA, ASSIGNOR TO MATHEWS GRAVITY CARRIER COMPANY, OF ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA.

GRAVITY FREIGHT-CARRIER.

No. 883,297.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed September 17, 1907. Serial No. 393,390.

To all whom it may concern:

Be it known that I, WILLIAM E. COURTNEY, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain Improvements in Gravity Freight-Carriers, of which the following is a specification.

This invention relates to improvements in gravity freight carriers, and particularly to the class of carriers known as gravity spirals, by means of which packages of freight, such as barrels, boxes, bales or bundles, may be transferred from a higher to a lower level, usually from an upper to a lower story of a building.

The object of the invention is to provide means, in the carrier itself, by which the barrels or other packages may be guided and maintained in proper position while passing downward on the carrier.

The invention consists generally in a spiral carrier having two series of rolls, the rolls of one series being arranged with their axes on lines radiating from the center of the spiral and the rolls of the other series being arranged with their axes at an angle to such radiating lines.

The invention consists further in the constructions and combinations hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification; Figure 1 is a plan view of a spiral conveyer constructed in accordance with my invention. Fig. 2 is a vertical section of the same. Fig. 3 is a detail plan section on line $y-y$ of Fig. 2. Fig. 4 is a detail section on line $x-x$ of Fig. 3. Fig. 5 is a detailed view of a modified construction.

In all of the drawings, 2, 2, represents the rails in which the inner series of rolls 3, 3, are mounted, and 4, 4, represents the rails in which the outer series of rolls 5 are mounted. Both series of rails are arranged spirally with tangential receiving and delivery sections 7, 7, and 9, 9. The rolls 3, 3 are arranged with their axes radial to the curve of the spiral while the rails 5 of the outer series are arranged with their axes at an angle to the axes of the rolls of the inner series (see Fig. 1). The outer ends of the outer rolls 5 are set slightly ahead of the inner ends of said rolls so that said rolls tend to move objects

that are passing over them towards the inner series of rolls. By this means, centrifugal force, which tends to move the packages outward as they pass down over the carrier, is counteracted and the packages or other articles are kept in proper position upon the rolls. The rolls of both series project above the rails (see Fig. 4) so that the packages passing over the carrier are prevented from coming in contact with said rails. The rolls may be mounted in said rails in any suitable manner. I prefer to provide a stationary shaft 10, secured in position in said rails by suitable nuts 11 and 12 and provided with bearing blocks 13, upon which the rolls are mounted by anti-friction bearings 14.

The frame for the carrier may be constructed in any suitable manner. I have here shown a central upright 15 mounted in a suitable bearing 16 and provided at its lower end with a series of upwardly inclined radial brace bars 17 and at its top with a series of downwardly inclined radial brace bars 18. To the ends of these brace bars the vertical supporting bars 19 are secured and a series of horizontal rails or supporting bars 20 have their outer ends secured to the vertical supporting bars 19 and their inner ends secured to collars 21 on the central support 15.

Above the inner track rails I prefer to provide two series of guide rails 22, 22 that are secured to inner upright supporting bars 23. These bars are secured at their lower ends to the diagonal bars 17 and at their upper ends to the diagonal bars 18. The horizontal supporting bars 20 may also be secured to the upright bars 23. I also prefer to provide the outer guide rail 24 that is secured to the upright bars 19 and above and inside of the guide rail 24 I prefer to provide a guide rail 25 that is vertically in line with the outer roll-supporting rail 4. The guide rail 25 is preferably supported upon the suitable hangers 26.

With this construction it will be seen that a very light but strong support is provided for the carrier, said support being suitably braced in all directions and being adapted to be quickly and economically set up and put in position for use.

With this construction, barrels, boxes or other packages will travel by gravity from the top to the bottom of said spiral at a practically uniform speed and without their be-

coming stopped or lodged at any intermediate point. As said packages travel downward over the carrier, centrifugal force tends to move them toward the outer circumference of the carrier. This, however, is counteracted by the angle at which the axes of the outer rollers are set, such angle being sufficient to give to the articles that come on to the outer rollers a slight inward movement.

10 In Fig. 5 I have illustrated a modified construction which consists in mounting the outer rolls so that the journals of their outer ends will be above the level of the journals of their inner ends and the packages passing

15 thereover will have a tendency to work toward the inner series of rollers, such movement being counteracted in part by centrifugal force. If preferred, the inner ends of these outer series of rollers may be located

20 slightly in the rear of their outer ends in addition to the difference in level of their journals.

I have shown gravity carriers arranged to deliver packages to the spirally arranged

25 rollers and these carriers may be located at the top of the spiral or at any desired point below the top and at the bottom of the spiral. I provide similar gravity carriers to receive the packages from the spirally arranged

30 rollers and convey them to any desired point at a distance from the spiral.

I claim as my invention:

1. A gravity freight carrier comprising spirally arranged rails, and a series of carrying rollers mounted in said rails with their

35 axes at an angle to lines radiating from the center of said spiral.

2. A gravity freight-carrier comprising spirally arranged rails, an inner series of carrying rollers mounted in said rails with their axes arranged in lines radiating from the center of said spiral, and an outer series of rollers mounted in said rails with their

40 axes at an angle to lines radiating from the center of said spiral, substantially as described.

3. A gravity freight-carrier comprising, in combination, spirally arranged rails, and rollers mounted in said rails with the outer

ends of the rollers in advance of the inner ends, for the purpose set forth.

4. A gravity freight-carrier comprising, in combination, two sets of spirally arranged rails, and rollers supported in each set of rails, the outer ends of the outer set of rollers

55 being in advance of the inner ends, for the purpose set forth.

5. A gravity carrier comprising an inner and outer series of spirally arranged rollers and spirally arranged vertical rails wherein

60 said rollers are journaled the journals of the outer ends of the outer series of rollers being above the level of the journals of the inner ends of said rollers, substantially as described.

6. A gravity carrier comprising an inner and an outer series of spirally arranged rollers, the inner ends of the outer series being in the rear slightly of the outer ends of said rollers whereby the packages moving thereover

70 will work toward the inner series of rollers.

7. A gravity carrier comprising an inner and an outer series of spirally arranged rollers, and spiral rails wherein said rollers are journaled, the rollers being arranged close together to form a continuous way the outer

75 series of rollers being arranged to direct the packages moving thereover toward the inner series of rollers and counteract the centrifugal force arising from the passage of the package

80 down the spiral, substantially as described.

8. A gravity carrier comprising an inner and an outer series of rollers spirally arranged, and vertical spiral rails wherein said rollers are journaled the outer series of rollers

85 being arranged to direct packages moving thereover toward the inner series of rollers, gravity carriers arranged to deliver packages to said spirally arranged rollers and gravity carriers arranged to receive the packages

90 from said spirally arranged rollers.

In witness whereof, I have hereunto set my hand this 12th day of September 1907.

WILLIAM E. COURTNEY.

Witnesses:

J. H. BALDWIN,
J. B. BYINGTON.