(No Model.) 2 Sheets—Sheet 1.

T. S. MILLER.

CONVEYING APPARATUS.

No. 601,756. Patented Apr. 5, 1898.

Fig. 2,

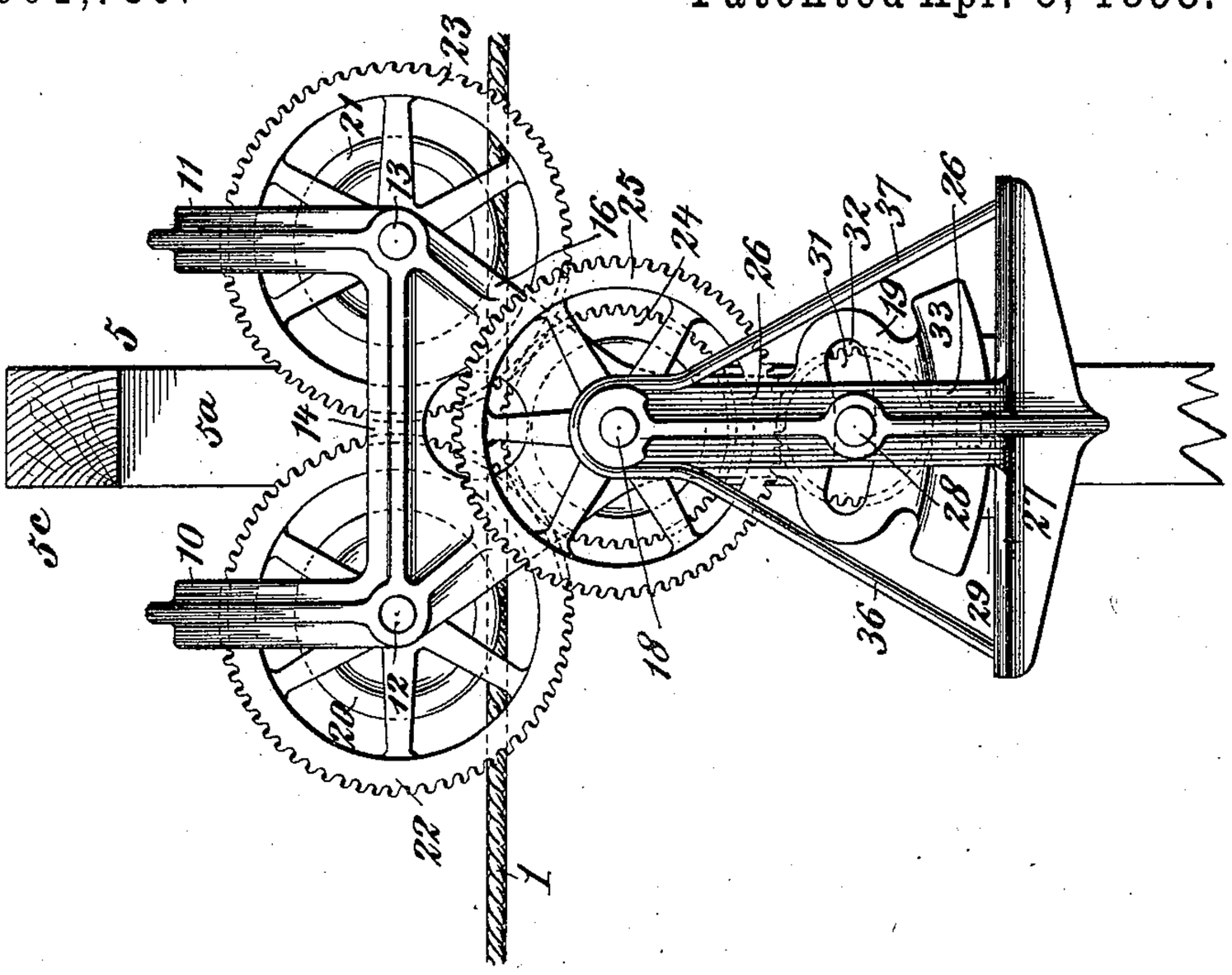
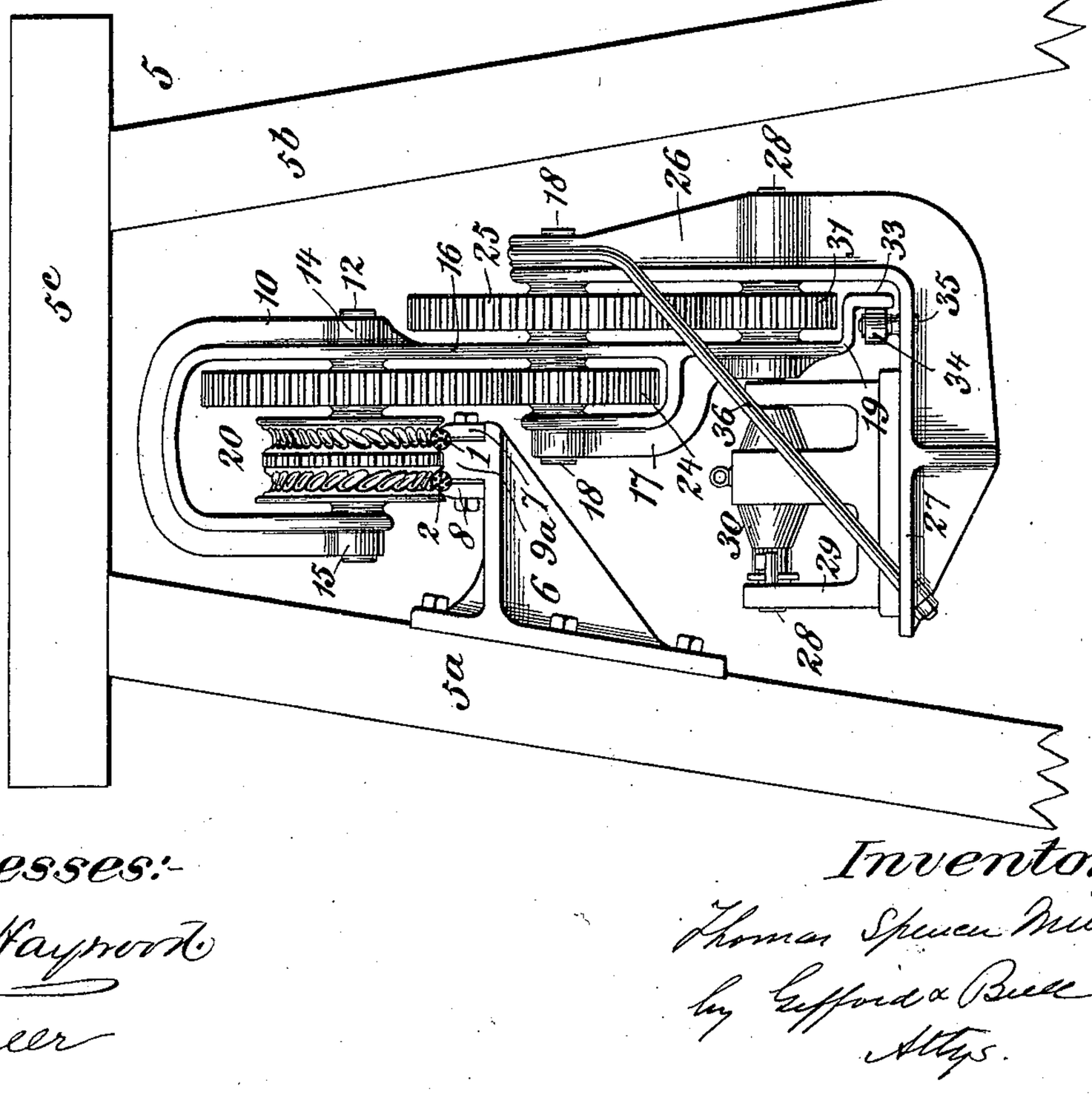


Fig. 1,



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J. E. Greer

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

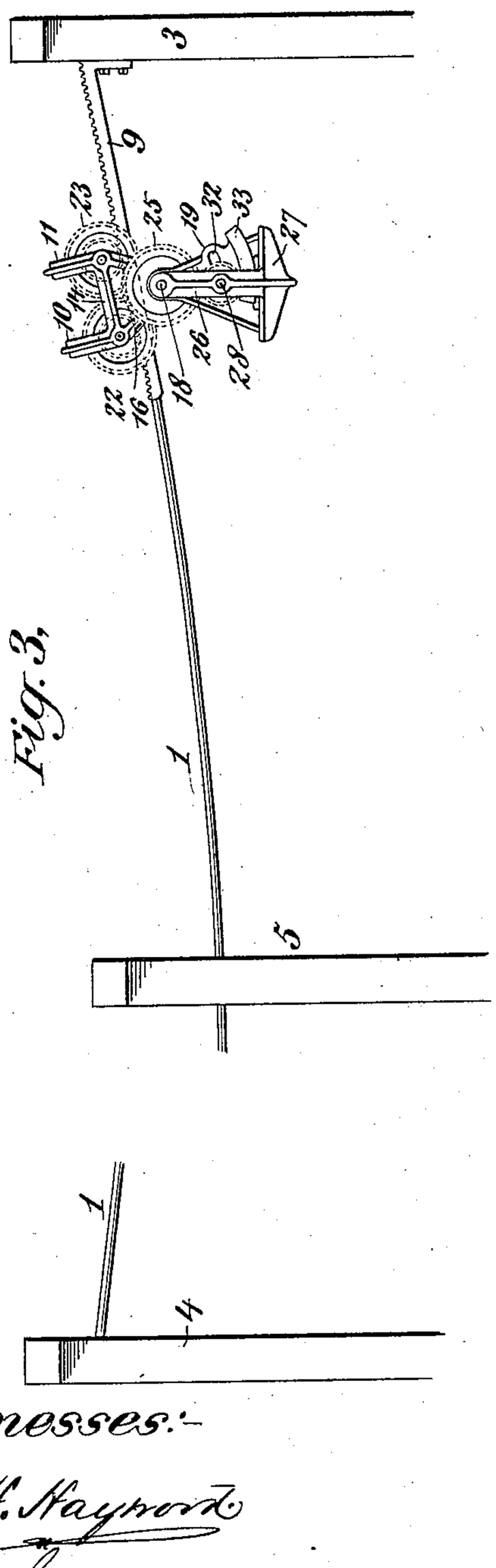

Fig. 5.

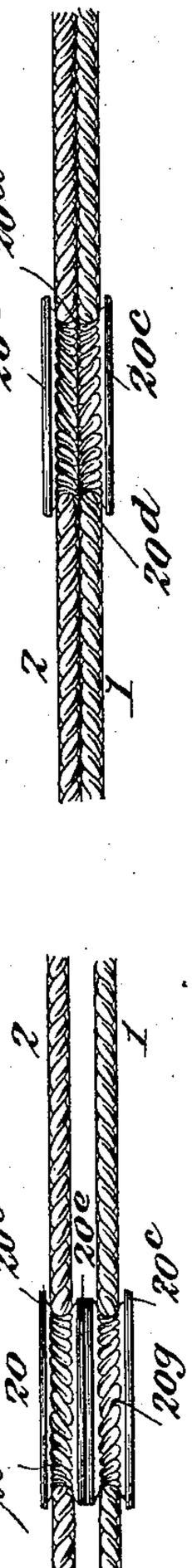

Fig. 4.

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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY.

CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 601,756, dated April 5, 1898.

Application filed October 18, 1895. Serial No. 566,050. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, a citizen of the United States, and a resident of South Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Conveying Apparatus, of which the following is a specification.

Figure 1 is an end view of the carriage; Fig. 2, a side view thereof with the supporting-frame in section; Fig. 3, a side view of the carriage supported upon a cable in position approaching one of the towers, with one of the cables omitted to show a rack between. Figs. 4 and 5 are details representing two forms of construction.

I will first describe the construction of the cable-trackway. It consists of two cables 1 and 2, supported so that they lie parallel and side by side, and together constitute substantially one track. They may lie either substantially in contact, as shown in Fig. 5, which is a preferable form, or somewhat separated, as shown in Figs. 4 and 1. Each cable consists, preferably, of crucible steel wire, and they are so arranged, as shown in Figs. 4 and 5, that their strands are twisted inversely—that is to say, the upper bearing-surface of the strands of one cable presents an inclination toward the right and of the other cable an inclination toward the left. By having the two cables side by side, constituting substantially a single trackway, with their strands twisted inversely, the tendency is for the friction of the wheel upon one to neutralize the sidewise tendency of the friction of the wheel upon the other, avoiding the tendency of the sidewise thrust from the inclination of the strands of either cable to throw the wheel out of perpendicular. Where this cable-track is used for long distances, I provide, in addition to the end towers 3 4, intermediate supports, such as 5. Each of these may consist of two uprights 5^a 5^b on opposite sides of the cable-track, with a cross-piece 5^c above and a bracket 6, carrying clamps 7 and 8, by which the cables 1 and 2 are clamped rigidly to the bracket and with relation to each other.

9 is a rack secured to one of the towers 3, parallel with the cables 1 and 2 and preferably between them. This rack extends a limited distance from the tower, so as to parallel the cables only to the extent of their steepest pitch. When this rack is employed, it may also be supported upon an intermediate support, such as 9^a, Fig. 1.

The carriage contains, preferably, a cast-iron frame consisting of the two bridge-pieces 10 11, carrying at their extremities the axles 12 and 13, and connected together by the horizontal pieces 14 and 15. From each horizontal piece hangs the piece 16, to which is connected the bridge-piece 17, carrying an axle 18 and a guiding projection 19. The parts 10, 11, 14, 15, 16, 17, and 19 are preferably cast in one piece.

Upon the axles or shafts 12 and 13 are fixed wheels 20 and 21, which are of like construction and one of which I will now describe. In its simplest form the wheel 20 is shown in Fig. 5. It consists at its periphery of a groove 20^a, bounded by the flanges 20^b and 20^c. The groove is constructed with an imprint of the surface of the cable-track in contact with which it is to run, so that each turn of each strand of the two cables fits into its imprint on the periphery of the wheel. The imprints of the strand-turns on the opposite sides of the central plane 20^d of the wheel are inclined in opposite directions to correspond with the inverse inclination of the strands of the two cables already referred to.

The wheel 20, as shown in Fig. 5, may be either constructed in one piece or in two pieces joined together on the central plane of the wheel, being in line 20^d of Fig. 5. The groove 20^a, by reason of being made to conform on opposite sides of the plane 20^d with the surface of the two cables, will in cross-section present two curvatures, each struck from a center corresponding substantially with the center of the cable with which it is to run in contact, which two curvatures will therefore be substantially tangent to the central plane 20^d.

The construction for the wheel 20 (shown in Fig. 4) differs from that shown in Fig. 5 by the addition of a flange 20^e between the inverse imprints upon the periphery of the wheel, so that the imprint for one cable is in a separate groove from the imprint for the other cable, and said two grooves 20^f and 20^g

are separated from each other by the flange 20^e, which projects into the space between the two cables 1 and 2.

22 and 23 are gears fixed upon the axles 12 and 13, respectively.

24 is a gear fixed upon the axle 18 and meshing into the gears 22 and 23. 25 is a gear fixed upon the axle 18. Any power driving the gear 25 will drive the wheels 20 and 21 and cause them to act as traction-wheels upon the cable-track.

The power for driving the wheel 25 may be mounted as follows: Upon the end of a shaft concentric with the wheel 25, which may be the shaft 18 itself, is suspended a pendulum-frame consisting of the downwardly-extending arm 26 and the horizontal platform 27. A shaft 28 has its bearing at one end in the arm 26 and its other bearing on a stand 29, mounted upon the platform, upon which platform is also carried a prime mover—such, for example, as the armature 30 of an electric motor for driving the shaft 28. 31 is a gear fixed upon the shaft 28 and meshing into the gear 25. The axis of the gear 31 swings in a curve concentric with the axis of the gear 25. The shaft 28 passes through the curved slot 32 in the guiding-arm 19, the curvature of which slot is also concentric with the axis of the gear 25. The extremity 33 of the guiding-arm 19 bears against a friction-wheel 34, mounted upon a stud 35, fixed to the platform 27. The pendulum-frame is braced by wrought-iron straps 36 37.

The frame 10, 11, 14, and 15 and all of the parts carried by it are so arranged and proportioned that the center of gravity lies substantially in the central vertical plane 20^d of the supporting-wheels 20 and 21, or, in other words, in the vertical plane passing between the cables 1 and 2.

The prime mover mounted upon the platform 27, whether it be a motor propelled by electricity, gas, or any other power, may be employed for hoisting as well as for traction purposes and may be controlled by any suitable means either by an attendant upon the platform itself or an attendant at the end of the stand.

I claim—

1. In a conveying apparatus, a trackway composed of two cables laid side by side each composed of wire strands, the strands of one cable being twisted inversely to those of the other, in combination with a traction-wheel running on said cables substantially as described.

2. In a conveying apparatus, in combination, a trackway composed of two cables laid side by side each composed of strands twisted together and a carriage containing a traction-wheel having upon its periphery the imprint of the supporting-surface of the strands of both of said cables, the strands of said cables being twisted inversely, substantially as described.

3. In a conveying apparatus, in combination, a load-carriage provided with a supporting grooved wheel and a trackway composed of a plurality of cables substantially equal in diameter laid side by side between the flanges of said wheel; said cables being composed of wire strands twisted inversely, substantially as described.

4. In a conveying apparatus, in combination, a load-carriage provided with a supporting grooved wheel and a track composed of a plurality of cables substantially equal in diameter laid side by side between the flanges of said wheel; said wheel being provided with an impression between its flanges corresponding with the supporting-surface of one or both of said cables, substantially as described.

5. In a conveying apparatus, in combination, two cables side by side, a rack parallel with them, a wheel having its periphery indented to correspond with the supporting-surface of said cable and gear-teeth adapted to engage with said rack, substantially as described.

6. A traction-wheel containing on its periphery imprints corresponding with the inversely-inclined strands of two side-by-side cables twisted in opposite directions, substantially as described.

7. A traction-wheel containing on its periphery the imprint of the strands of two side-by-side cables, in combination with gear-teeth, substantially as described.

8. In a conveying apparatus, in combination the shaft 12, the traction-wheel 20 and gear 22 fixed thereon, the shaft 13, the traction-wheel 21 and gear 23 fixed thereon and a frame consisting of the bridge-piece 11 carrying the ends of said shaft 13, the bridge-piece 10 carrying the ends of said shaft 12 and a longitudinal piece 14 connecting said bridge-pieces and a pendent piece 16 provided with bearings for the shaft 18, and the shaft 18 substantially as described.

9. In a conveying apparatus, in combination, a trackway, traction-wheels thereon, a frame carried by said traction-wheels, a shaft, as 18 carrying the gear-wheel 25, means whereby said gear-wheel is connected with said traction-wheels, a platform 27, a pivotal support for said platform concentric with said wheel 25, a motor mounted upon said platform, gearing whereby said motor is connected with said gear 25 and a steadying-arm 19 connected with said frame and having a slot through which the shaft of said motor passes, substantially as described.

10. In a conveying apparatus, in combination, the traction-wheels, the shafts 12 and 13, the frame provided with the bearings for said shafts, the gears 22 and 23 fixed to said shafts, the shaft 18 also having its bearing in said frame, the gears 24 and 25 fixed upon said shaft 18, the pendulum-frame pivoted upon the end of said shaft 18, a motor-shaft 28 carried by said pendulum-frame and a

gearing 31 whereby said motor-shaft is connected with said gear 25, substantially as described.

11. In a conveying apparatus, in combination, the traction-wheels, the shafts 12 and 13, the frame provided with the bearings for said shafts, the gears 22 and 23 fixed to said shafts, the shaft 18 also having its bearing in said frame, the gears 24 and 25 fixed upon said shaft 18, the pendulum-frame pivoted upon the end of said shaft 18, a motor-shaft 28 carried by said pendulum-frame and a gearing 31 whereby said motor-shaft is connected with said gear 25, an arm extending downward from said traction-wheel frame and a bearing-surface upon said pendulum-frame resting in contact with said arm as said pendulum-frame vibrates upon the shaft 18, substantially as described.

12. In a conveying apparatus in combination two cables laid side by side the strands of one cable being twisted inversely to those of the other and a traction-wheel having upon its periphery an imprint of the supporting-surface of said strand, substantially as described.

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