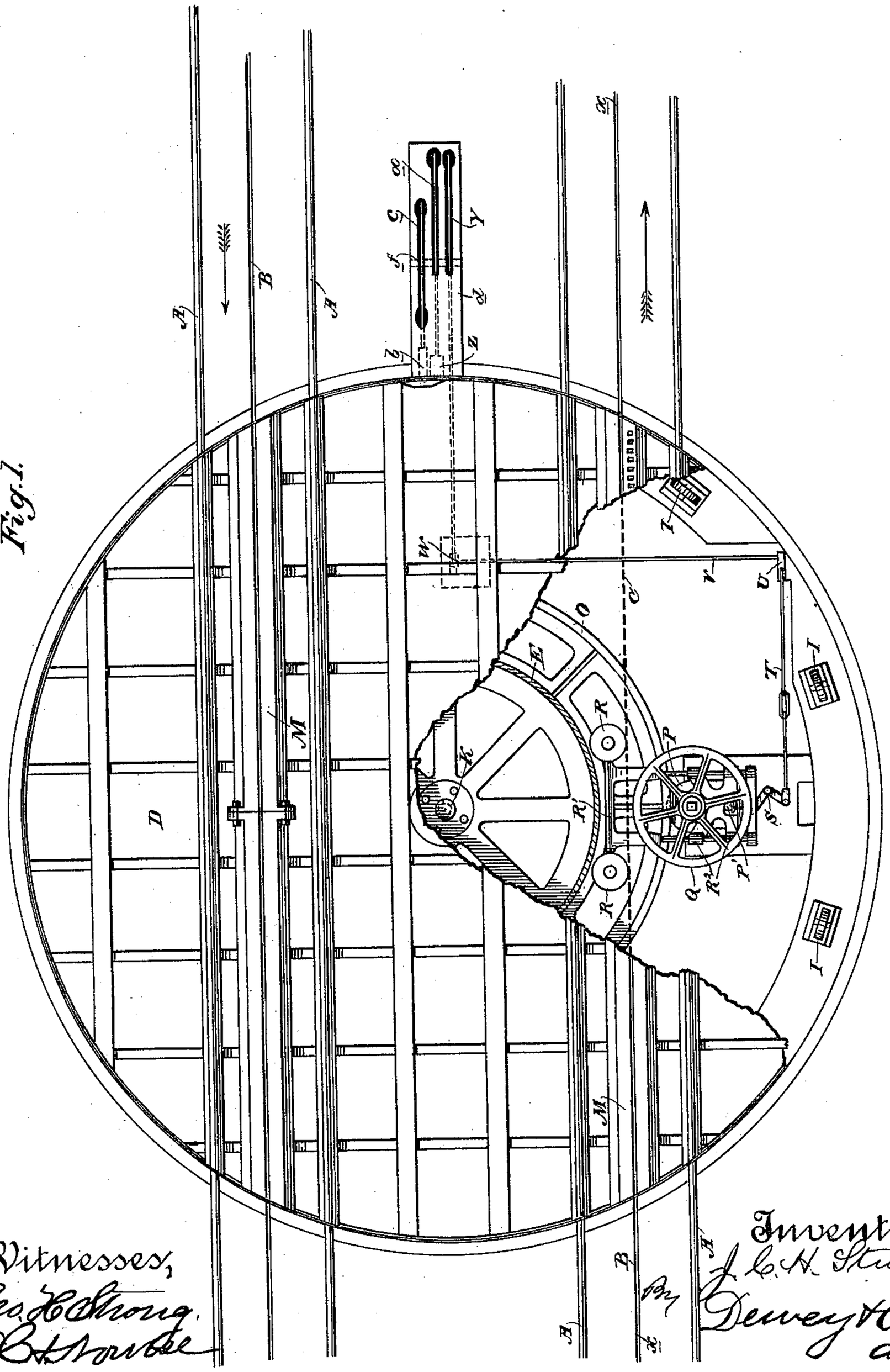
(No Model.) 4 Sheets—Sheet 1.

J. C. H. STUT.

CABLE RAILWAY TURN TABLE.

No. 408,443. Patented Aug. 6, 1889.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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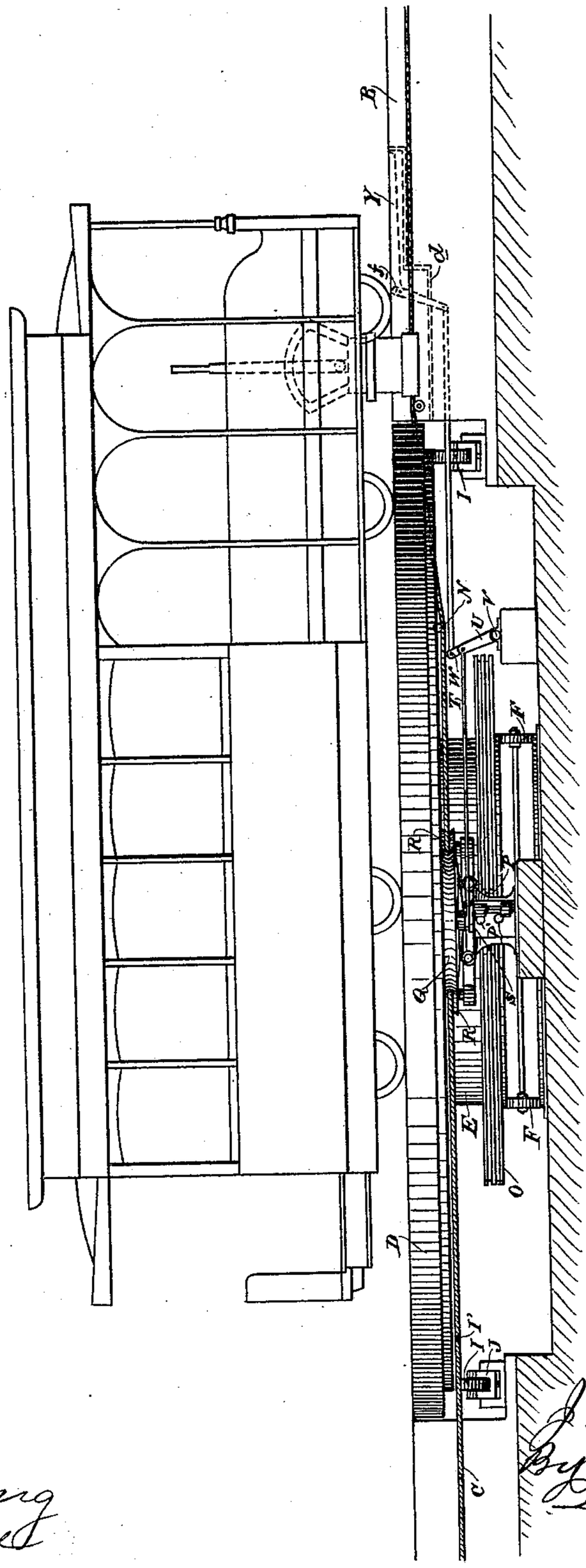
CABLE RAILWAY TURN TABLE.

No. 408,443. Patented Aug. 6, 1889.

Fig. 2.



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4 Sheets—Sheet 3.

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CABLE RAILWAY TURN TABLE.

No. 408,443. Patented Aug. 6, 1889.

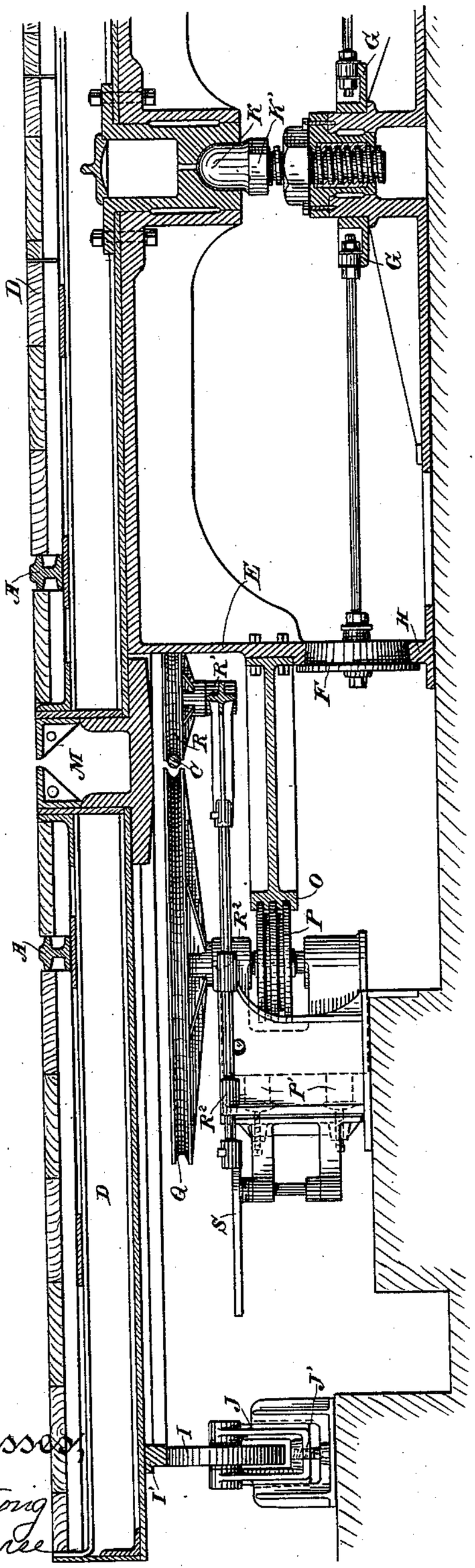

Fig. 3.

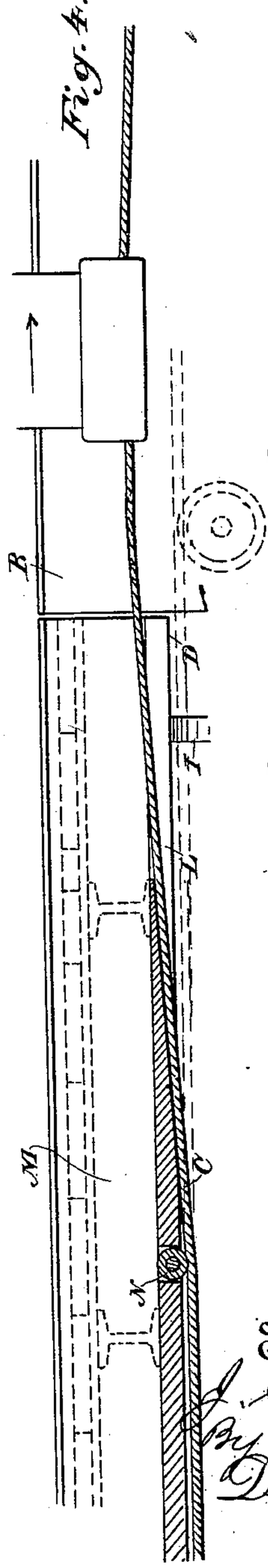

Fig. 4.

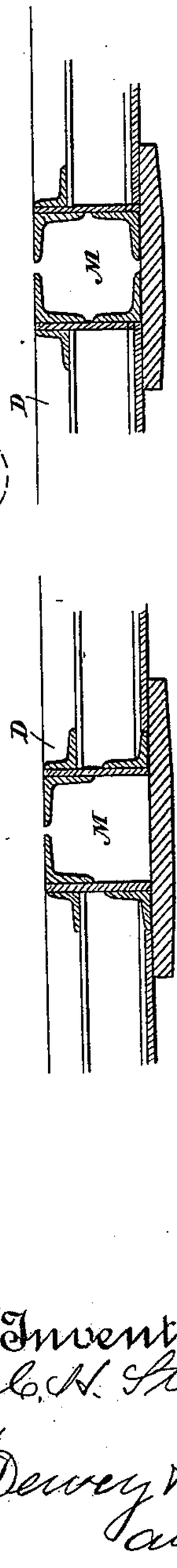

Fig. 6.

Fig. 5.

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CABLE RAILWAY TURN TABLE.

No. 408,443. Patented Aug. 6, 1889.

Fig. 7.

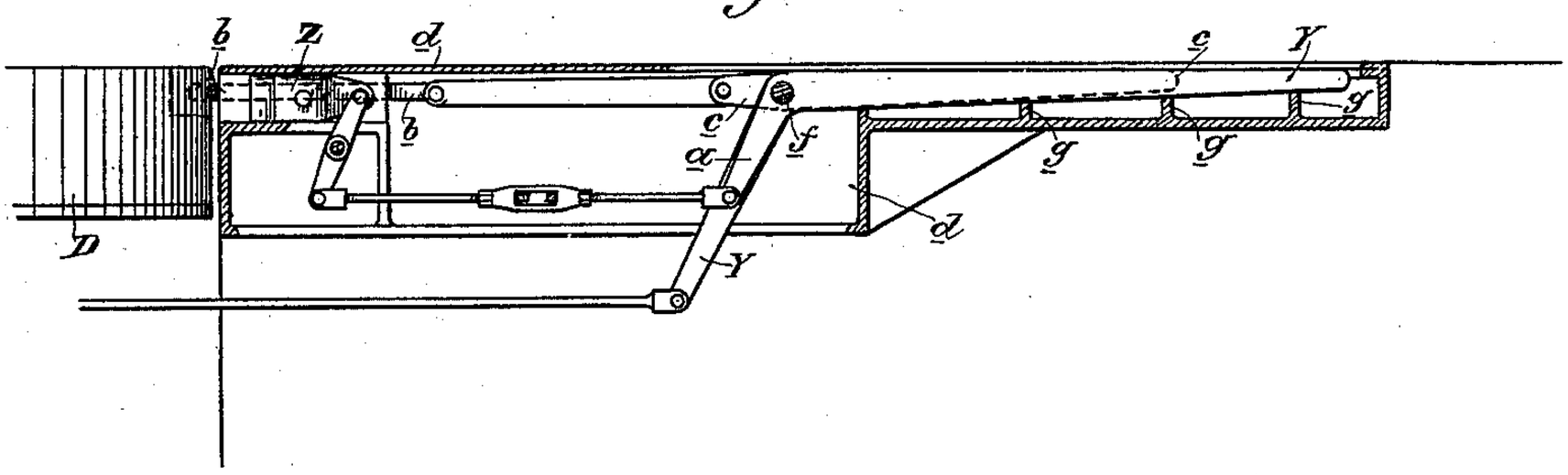
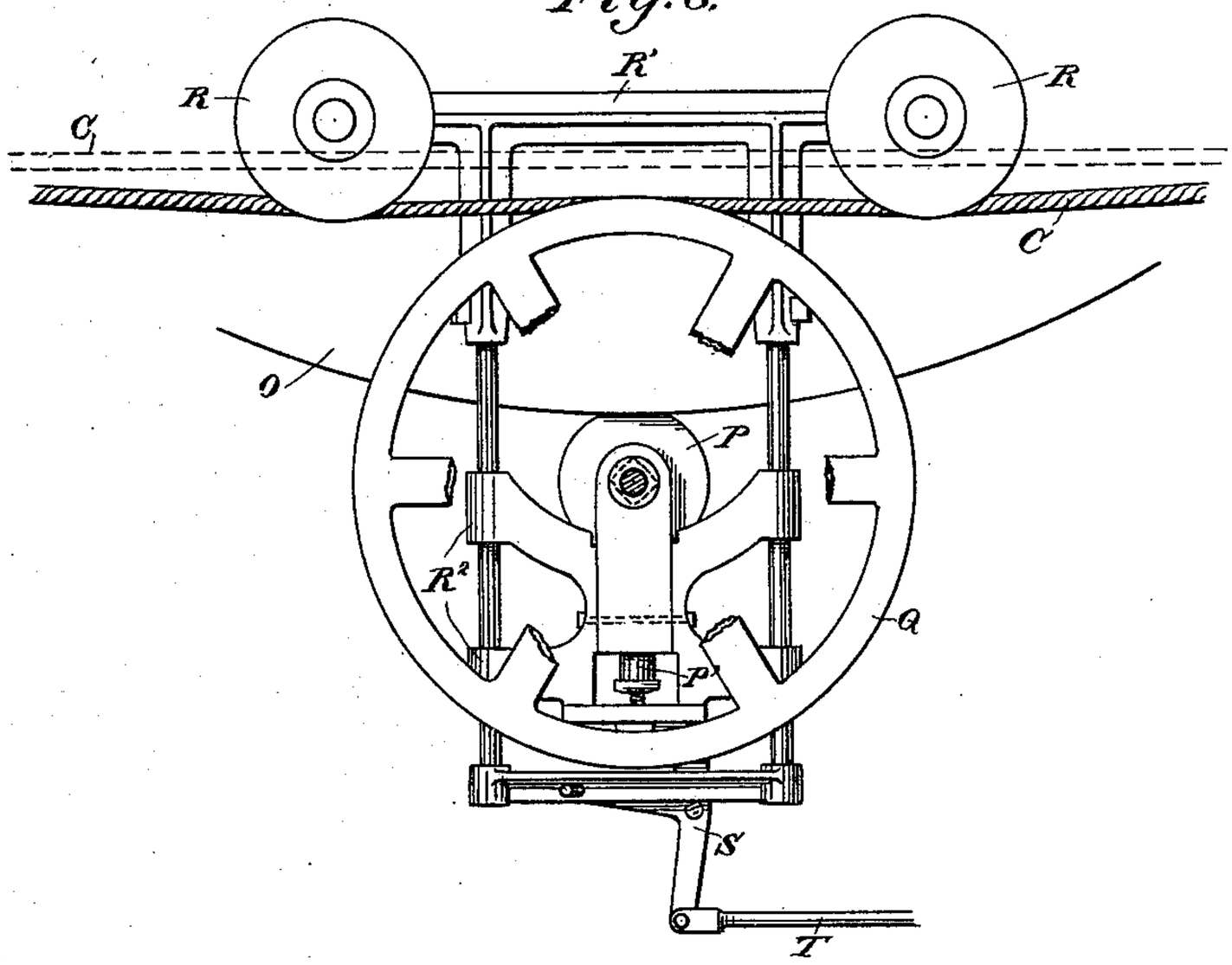


Fig. 8.



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Attys

UNITED STATES PATENT OFFICE.

JOHN CH. H. STUT, OF SAN FRANCISCO, CALIFORNIA.

CABLE-RAILWAY TURN-TABLE.

SPECIFICATION forming part of Letters Patent No. 408,443, dated August 6, 1889.

Application filed January 19, 1889. Serial No. 296,905. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHRISTIAN HENRY STUT, of the city and county of San Francisco, State of California, have invented an Improvement in Cable-Railway Turn-Tables; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved construction for turn-tables for cable railways, whereby the turn-table may be introduced into the track at any point in the line thereof, and may be turned around so as to reverse the car by the direct action of the traveling cable, and without the necessity of depressing the cable in any way in order to clear the table, or in any way interfering with the action thereof, or using any supplemental connections to turn the table.

It consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view of the turn-table, showing the iron construction only, with a portion broken away to show the operating mechanism beneath. Fig. 2 is a vertical section taken through the line of the nearest cable-tube at *x x* of Fig. 1. Fig. 3 is a vertical section of part of the table at one side of the center and at right angles with the track and cable-tube. Fig. 4 is a vertical longitudinal section through the grip-channel at one edge of the table, and showing the position of the cable when the car is ready to move off the table. Figs. 5 and 6 are sections showing modifications in the construction of the turn-table grip-channels. Fig. 7 is a longitudinal vertical section through the lever-box. Fig. 8 is a plan of a part, showing the main cable brought into contact with the table-actuating pulley.

A A are the two parallel lines of track of a cable railway, having each a central slot B, through which the grip-shank from the car passes in the usual manner, so as to take hold of the cable C, which travels in the usual tube or channel beneath each of the track-lines of the railway. It often becomes necessary to turn the cars around at points intermediate between the ends of the track, as in case of fire or other obstruction, and my table is designed not only for convenient use at the ends of the track, but also so that it can be introduced at any desired point between the ends of the track, and so that a car may be transferred from one track to the other and reversed to return from this point without going to the end of the road.

D is the turn-table, of any suitable diameter, built of steel or iron angle or channel beams for strength with the least possible depth, as shown in Figs. 1 and 3, and having a central cylindrical portion E, which extends downwardly between the two oppositely-traveling lines of cable, this central portion being supported upon wheels F, journaled upon shafts which radiate from a central ring G, these wheels traveling upon a circular track H, as shown. The table is strongly built of steel or iron beams, so that the portion which projects over the cables may be made comparatively thin, or with so little depth that the cables will pass beneath it without contact and without the necessity of any downward deflection at this point. The outer periphery of the table is supported upon wheels or rollers I, which are journaled in fixed positions upon short radially-placed shafts. The lower surface of the turn-table is properly formed or provided with a track or surface I′, which rests upon these outer rollers, and when the table is turned around the central portion or ring E is supported upon the wheels F, first mentioned, while the outer portion of the table is supported upon the wheels or rollers I. The wheels I are journaled in frames or supports J, which are vertically adjustable by means of screws J′, Fig. 3, so as to compensate for any settling of the parts and to keep the outer periphery of the table at all times as nearly level as possible. The center of the table is in like manner adjusted by means of a vertically-moving screw having a round head K upon its upper end, which fits into a central step or socket and forms the guide and center around which the table turns. This socket may be removed from above, and as the screw-shank has a square or polygonal part K′ thus exposed it may be adjusted from above. The table is formed of steel or iron plates properly strengthened and braced and secured together in a mechanical way, and in order to give the grip-channel strength the table has the troughs or channels M built across it

from side to side in line with the grip-slots of the road and above the line of the cable. These channels are made of cast-iron, cast-steel, angle-iron, or angle-steel, bolted together or otherwise constructed so as to give the greatest possible stiffness for the thinnest portion, as in Figs. 3, 5, and 6, and they are of sufficient depth and width to admit of the grip-shank passing into them through a slot in the top of the table which corresponds with the slot in the road-bed, the grips traveling within these channels, while the cables travel beneath them and beneath the table and above the driving-wheel for the table. The grip is disengaged from the cable when the car reaches one of these turn-tables, and the car runs onto the table by momentum already acquired, the grip simply running into the channel above described. If desired, the lower part of these channel-beams may be cut away or slotted out for a distance from the end from which the car leaves the table, as shown at L, Fig. 4, sufficient to allow the cable to be raised and engaged by the grip when the car moves off the table. As the cable will be slightly raised, so that the grip will take it, a depression-pulley N, supported in the table, prevents its coming in contact with the iron-work of the bottom of the channel of the table.

As the cylindrical supporting-center E of the table which extends below the horizontal plane of the cables is of smaller diameter than the distance between the counter-lines of the cables, it will be manifest that the table can be turned around without in any way interfering with or touching the cables. In order to turn this table, a driving-wheel O projects from the lower part of the cylinder E below the cables, and having its periphery formed in any suitable manner to engage with a corresponding driving-pinion P. In the present case I have shown the periphery of the driving-wheel O as having grooves or channels formed therein, into which the projecting flanges of the pinion P enter when the pinion is brought in contact therewith, so that by the rotation of the pinion the wheel will be caused to rotate. It is manifest that a gear-wheel and pinion may be substituted for this frictional device, or that any other known or suitable mechanism may be used for transmitting power from one to the other. The pinion-shaft is journaled in a movable frame acted upon by adjustable springs P′, which keep the pinion and wheel in contact with the proper degree of pressure.

The shaft of the pinion P is journaled in a vertical support, and upon the upper end of this same shaft is fixed a wheel Q, also rotating in a horizontal plane and having its periphery made V-shaped, or of such form that when the traveling cable is pressed against it the friction of the cable within this groove or channel will be sufficient to rotate the wheel, and also the pinion P, above described.

The periphery of the wheel Q is very near the cable C, which travels in a horizontal plane with the wheel, so that by being pressed slightly to one side of its normal line of travel it will be thrown into contact with this wheel-rim, and thus cause it and the above-described gearing and the turn-table to revolve.

In order to throw the cable into contact with the wheel Q, I have shown two small grooved wheels R R, journaled in a frame-work or cross-head R′, which slides or moves horizontally by means of levers, so that these pulleys may be brought into contact with the side of the cable opposite to the wheel Q, one at a little distance at each side of the periphery of said wheel, and they will thus force the cable into contact with the wheel. The cross-head carrying these pulleys travels in suitable horizontal guides R^2, and has connected with it the bell-crank lever S, and this is connected by a rod T with a rocker-arm U upon the horizontal shaft V, journaled in the pit of the turn-table. Upon the opposite end of this shaft is a crank or rocker arm W, which is connected with the operating-lever Y, fixed in a suitable position in a box, preferably between the lines of track just outside of the turn-table, as shown. When by means of this lever and these connections the sliding frame is moved so as to press the pulleys R into contact with the cable, the latter is forced against the periphery of the grooved wheel Q, as shown in Fig. 8, and this causes it to rotate, driving its shaft and the pinion P above described. The pinion P traveling in contact, by means of springs, with the wheel O, which, as before described, is fixed to the cylindrical or central portion of the turn-table, the latter will be caused to rotate, the upper portion of the turn-table turning above and clear of the cables and the driving-wheel below, the outer periphery of the table being supported upon the wheels I, which are journaled around the periphery, and the inner portion upon the wheels F, upon which the central cylindrical portion of the ring E rests, and also upon the central step and spindle K.

By building the table of steel plates, making it shallow, and strengthening and supporting it as above described, I am enabled to give it so little depth near the circumference that it will rotate above the cable and out of contact therewith, and at the same time be sufficiently rigid to support the car upon it, and also, by reason of its supports, to maintain itself approximately level and true. In order, however, to provide for any slight variation or irregularity in the rotation of the table and the driving-wheel O, the pinion P is loosely fitted upon its shaft, either by means of a feather or by making the shaft square or polygonal, so that its wheel may rock or move slightly up or down, and thus adjust itself to any variation in the position of the peripheral grooves of the wheel O. As the two lines of track cross the table equidistant from its center of motion and correspond exactly with the lines of track of the road-bed,

it will be manifest that when a car arrives at a table upon one side it is transferred to the other line of track and reversed by simply turning the table half round.

In order to check the table as it arrives at nearly the point where it should stop, I employ a frictional brake Z, which presses against the periphery of the table, and when the cable is allowed to move out of contact with the friction-wheel Q, by releasing the lever which operates the pressure-pulleys R, the brake may be operated by means of its lever *a*, so as to check the table, and when the latter reaches a point where its two tracks are in line with those of the road-bed the locking-bolt *b* is dropped into the slot provided for it in or upon the table by means of a lever *c*, thus holding the whole in proper position.

If one or more of these tables be placed in the road-bed at points between the termini, it is only necessary for the gripman on the car to release the cable just before arriving at the table in the same manner as is done when another cable is to be crossed, and the car by its momentum will run across the table, so that the cable may be again picked up on the opposite side without detention.

The hand-levers Y, *a*, and *c*, above described, are preferably contained in a shallow iron box *d*, the top of which is flush with the ground at one side of the turn-table and between the tracks of the two lines. The top is slotted to allow the levers to drop down out of the way of traffic, and all the levers are fitted to a common fulcrum-shaft *f*, which is fixed across the box. The extension of the box into which the handles drop has ribs *g* across the bottoms and of such a height that the levers rest upon them, and the upper edges of the levers are flush with the top of the box and the roadway.

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

1. The horizontal rotating turn-table having its center of motion between the lines of two cable-railway tracks, a central cylindrical flanged portion extending downwardly between the main cables and below their plane of travel, and bearing wheels or rollers, upon which the flange is supported on a circular track, upon which the said wheels travel when the table is rotated, in combination with wheels or rollers around the circumference of the table and journaled upon stationary radial axes beneath the periphery of the table, substantially as described.

2. The steel or iron turning table, with its center of motion central between two lines of cable-railway tracks, a central cylindrical flanged portion extending downward between and below the line of travel of the cables, and wheels upon which said cylinder rests and turns, and a second set of wheels or rollers journaled upon radially-fixed axes beneath the periphery of the table, in combination with the horizontal troughs or channels built in the table in lines which correspond with the cable tube or channel of the road-bed, and having slots corresponding with the slot therein, whereby the grip may enter said channels when disengaged from the cable, substantially as described.

3. The horizontal rotating table having its axis between the two parallel lines of cable-railway track, corresponding tracks upon its surface upon which the cars can be received from either of the lines of track, and tubes or channels with slots in the top through which the grip-shank and grip may pass as the car passes over the table, and the exterior and interior sets of wheels or rollers upon which the table is supported in its rotation, in combination with the horizontal driving-wheel connected with the central portion of the turn-table beneath the line of travel of the cables, the corresponding pinion through which power is transmitted to the driving-wheel, a grooved pulley fixed upon the shaft of said pinion in the horizontal plane of travel of the cable, and grooved sheaves supported upon a frame or cross-head upon the opposite side of the cable, said cross-head being movable, so that the movable sheaves will force the cable into contact with the grooved driving-pulley, substantially as described.

4. The driving gear-wheel fixed to the lower part of the turn-table beneath the line in which the cables travel, the vertical driving-shaft, grooved wheel, and the movable sheaves, whereby the cable is forced into contact with the wheel, in combination with the pinion through which power is transmitted to the driving-wheel, said pinion being mounted so as to have a vertical or self-adjusting movement upon its shaft to compensate for irregularities in the movement of the driving-wheel with which it contacts, substantially as described.

5. A cable railway and the cable thereof, the turn-table mounted upon bearing wheels and rollers, with channels or troughs through which the grip of the car may pass above the plane of travel of the cable, and the driving-wheel and pinion situated below the plane of travel of the cable and outside thereof, in combination with the sheaves journaled to a movable cross-head upon the opposite side of the cable, rocker-arms, levers, and connecting-rods, whereby said frame or cross-head may be moved so that the sheaves force the cable into contact with the grooved pulley or allow it to travel independent thereof, substantially as described.

6. The horizontally-rotating turn-table, with its grip channels or troughs, the supporting wheels or rollers upon which it rotates, and the driving-pulley and pinion through which power is transmitted to rotate the turn-table, in combination with the rubber or other elastic springs whereby the contact between the pinion and the wheel is maintained, substantially as described.

7. The horizontally-rotating table, with the

U-shaped troughs or strengthening grip-channels, the supporting wheels or rollers, and the corresponding tracks, in combination with the central step and screw-threaded adjustable cone fitting said step supporting the center of the table, substantially as described.

8. The horizontally-rotating turn-table, with central wheels or rollers and cylindrical ring or flange projecting downwardly from the table and resting upon said wheels, in combination with the exterior rollers around the circumference of the table and turning upon stationary shafts, and the vertically-adjustable standards or supports in which said shafts are journaled, substantially as described.

9. The horizontally-rotating table, with the supporting wheels and rollers, the troughs or grip-channels extending across the table in line with the slots and tubes of the roadway, and having the channel for the grip-shank upon the upper sides and the open space or slot near the ends of the lower sides, substantially as described.

10. The U-shaped grip-channels having slots for the shanks upon the upper surface extending across the turn-table in line with the tubes and slots of the railway, having the openings made in the lower sides at the ends toward which the car departs from the table, in combination with depression-pulleys upon the table, whereby the cable is prevented from striking the bottom of the channel when it is taken by the grip, substantially as described.

11. The horizontally-rotating table, with the supporting wheels or rollers, the frictional sheaves whereby power is transmitted from the endless traveling cable to rotate the table, a friction-brake acting against the periphery of the table, a latch whereby the table is locked in place when the rails are in line with those of the road, the levers operating the said latch, brake, and also the friction-gearing being journaled upon a single fulcrum-shaft and contained within a box in the road-bed at the side of the table, substantially as herein described.

12. The lever-box fixed in the roadway at one side of the turn-table, with a common fulcrum-shaft for the levers, and having the slots in the top in which the levers lie and the supporting-ribs in the bottom, substantially as described.

13. The parallel moving ropes of a cable railway, a circular turning table pivoted centrally between the ropes and extending horizontally above and beyond the cables, and a driving-gear having a common center with the table and projecting horizontally beyond the line of the cables and below them, in combination with a central cylindrical drum extending downward from the table, uniting it with the driving-wheel, and having a diameter less than the distance between the cables, substantially as herein described.

14. The turn-table with the downwardly-projecting central portions, upon each side of which one portion of the cable travels beneath the table, a driving-wheel of greater diameter extending from this central portion beneath the cables, a corresponding pinion engaging said wheel, and a grooved wheel upon the pinion shaft in the longitudinal plane of the cable and exterior thereto, in combination with sheaves by which the cable is forced into contact with the grooved wheel, said sheaves being mounted between the cable and the central portion of the turn-table, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN CH. H. STUT.

Witnesses:
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H. C. LEE.