

(No Model.)

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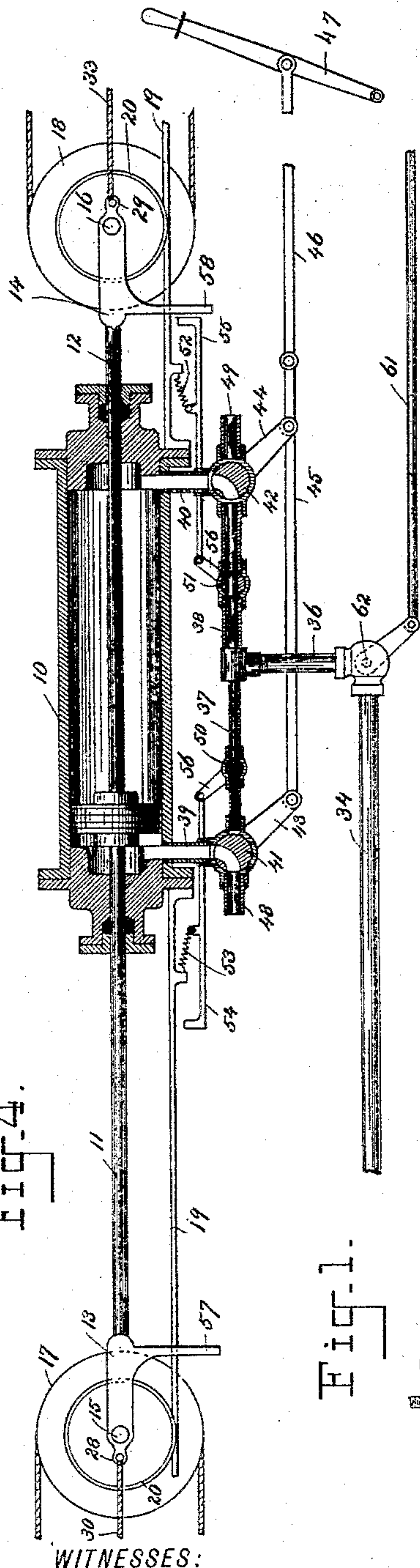
J. H. PENDLETON.

CABLE RAILWAY.

No. 387,910.

Patented Aug. 14, 1888.

Fig. 4.



WITNESSES:

John F. Nelson
Emma Arthur

Fig. 1.

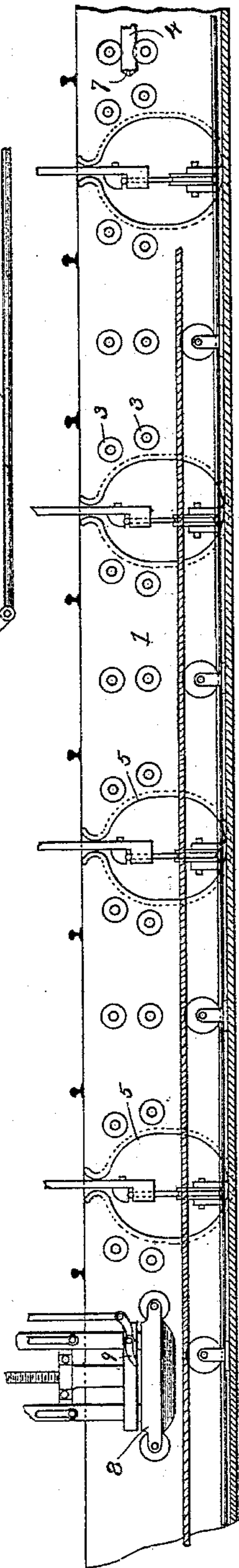
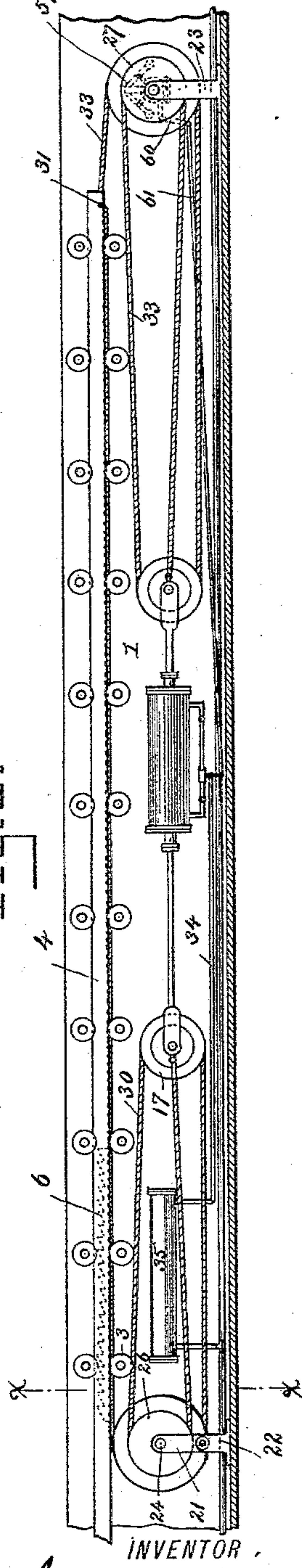


Fig. 2.



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Fig. 3.

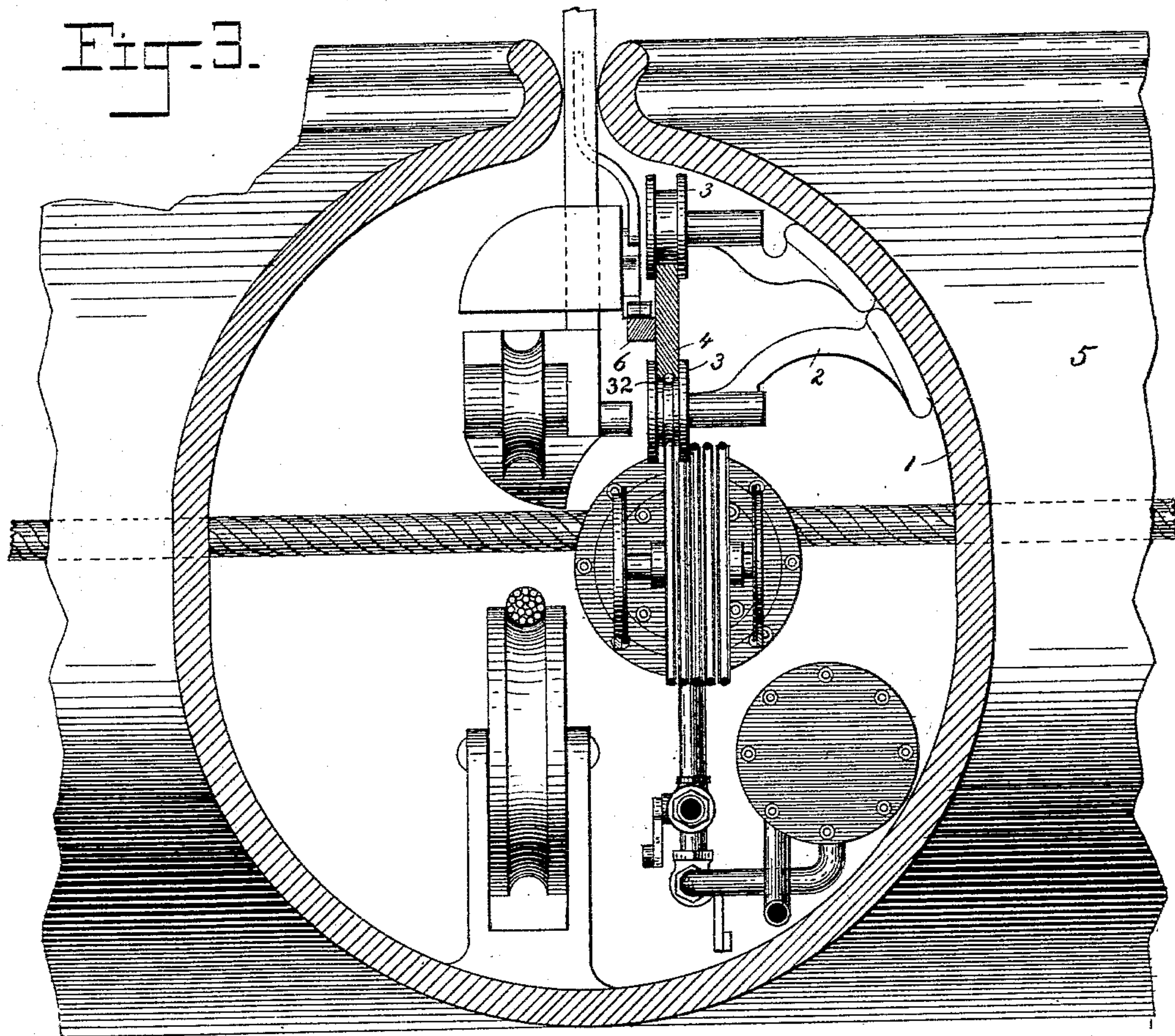
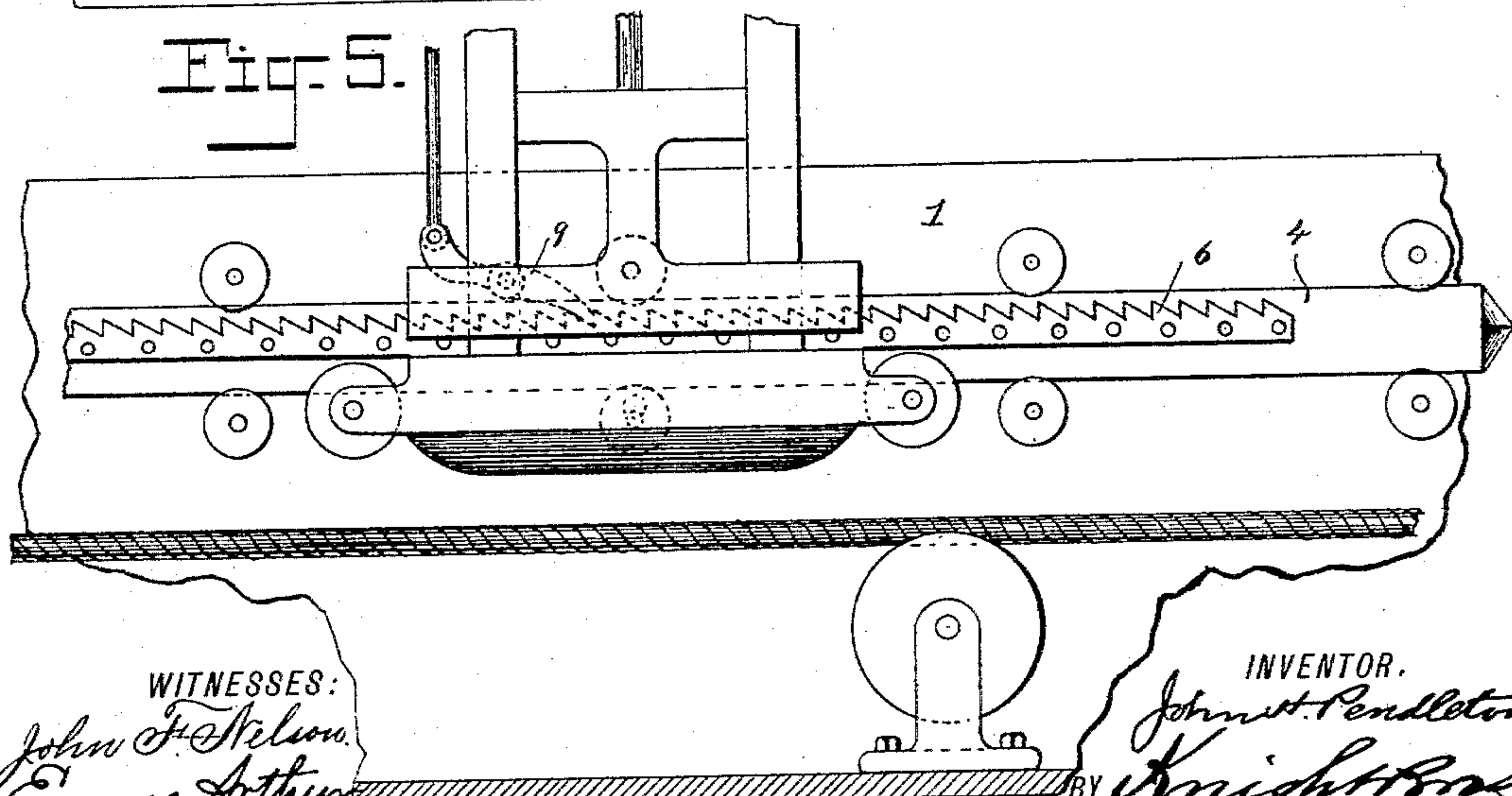


Fig. 5.



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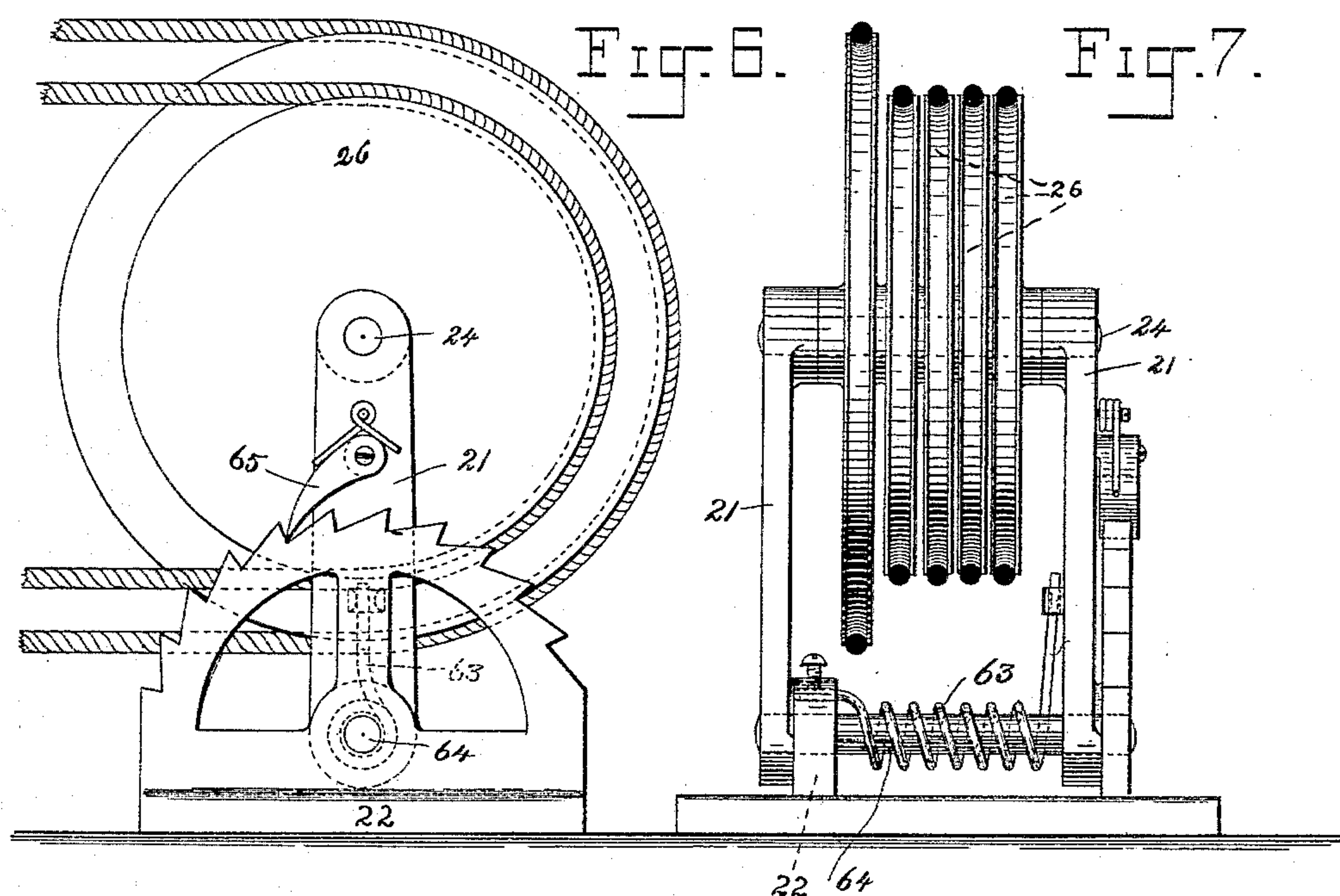
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UNITED STATES PATENT OFFICE.

JOHN H. PENDLETON, OF BROOKLYN, ASSIGNOR TO THE RAPID TRANSIT
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CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 387,910, dated August 14, 1888.

Application filed December 19, 1887. Serial No. 258,347. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PENDLETON, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Cable Railways, of which the following is a full, clear, and exact specification.

My invention relates to improvements in cable railways, and has for its object to obviate grave difficulties entailed by lines crossing each other. In such instances it is of course essential that the traction-cables of one line should pass under the cables of the other line, which of course necessitates the abandonment of the lower cable at such junctures, and also necessitates the employment of some auxiliary motive power for conveying the cars across such crossings.

With the above-named object in view, my invention consists, essentially, in placing at each of these cross-roads a long tongue or strip which is located longitudinally in the cable-tunnel between suitable guiding-rollers or the like, and is provided at its end with a ratchet-bar or a similar device, which is intended to engage with a pawl on the car when the same approaches the crossing, motion being imparted to the said tongue by any suitable engine; but I prefer to employ a device forming an important feature of my invention, which will now be described with reference to the accompanying drawings, forming a part of this application.

It may be here stated that the whole subject-matter of the present application is also shown and described in my application, Serial No. 258,344, filed of even date with this.

Figure 1 is a vertical longitudinal section of the cable-tunnel, showing the cross-tunnels in end view, and showing at one side of the latter tunnels the grip of the car waiting to be towed across, and at the other side the point of the before-mentioned tongue. Fig. 2 is a similar view of the same tunnel farther on, it being broken off of the right-hand side of the portion shown in Fig. 1, and showing the balance of the tongue and the engine for operating the same. Fig. 3 is a transverse section of the same tunnel, taken on the line X X, Fig. 2, the car supposed to be over the crossing. Fig. 4 is an enlarged detail view, partly in

section, of the engine employed. Fig. 5 is a detail view showing the pawl on the grip in engagement with the ratchet. Figs. 6 and 7 are respectively side and end elevations of the form of tightener preferably employed by me.

1 represents the walls of the tunnel, which extend across the up and down tracks 5, and to the side of which are secured brackets 2, arranged in pairs one above the other, and having journaled in their ends idle-rollers 3, whose peripheries are provided with square grooves.

4 is a long tongue or strip, of metal or other suitable material, which is of sufficient thickness to insure its rigidity, and whose upper and lower edge are situated in the said square grooves of the rollers 3. This tongue or strip is provided near one end with a ratchet-bar, 6, which is bolted or otherwise secured to the side of the same, and its tip end is pointed, as at 7, to enable the said tongue to be thrust freely between the idle-rollers 3, which serve as a track. This tongue 4 is adapted to be projected forward across the track and place the ratchet 6, near its end, under the grip 8 of the car, on which is pivoted a pawl, 9, which latter engages with the ratchet and places the operator—who may be at any suitable location on the other side of the crossing—in power to draw the car across the tunnels 5 by operating mechanism which will presently be described.

10 is a cylinder containing a piston with piston-rods 11 12 projecting from both ends thereof. The outer ends of these rods are screw-threaded, and have screwed thereon brackets 13 14, in which latter are secured pintles, 15 16, respectively. On the pintle 15 are mounted a number (five are shown) of independently-revoluble sheaves, 17, and on the other pintle, 16, are also mounted an equal number of like sheaves, 18.

19 are tracks, of any suitable description, upon which rest track-wheels 20, which are mounted on the pintles 15 16, and serve to support the sheaves and piston-rod upon the said track.

21 are standards which are pivoted to a stationary block, 22, on the floor of the tunnel at one end of the cylinder, and 23 are fixed standards planted in the floor of the tunnel at the other end of the cylinder.

24 is a pintle extending between the stand-

ards 21 and having mounted thereon a series of sheaves, 26, in number equal to those on the end of the piston-rod, which are in like manner revoluble independently of each other.

5 The fixed standards 23 are also provided with a similar series of sheaves, 27.

Secured to one side of the brackets 13 14 are links 28 29, respectively, in the former of which is secured the end of a cable, 30, which
10 is rove alternately around the sheaves in the two series 17 26 and then passes from the end sheave (which is of larger diameter than the other form) over one of bottom rollers, 3, and extends along the grooves in the bottom row
15 of these rollers to the farthest end of the tongue 4, where it is secured to the latter at 31, the under side of the tongue being provided with a channel, 32, to accommodate the cable, and a cable, 33, is in like manner secured to the
20 link 29 on the bracket 14, rove on the pulleys at this end of the cylinder and passing from the large sheave in the series 27 is likewise secured at 31 to the said end of the tongue 4.

25 It will be readily understood that by employing a multiplicity of sheaves rove with the cable and connected with the piston and tongue, as described, I am enabled to operate the tongue at wide crossings with a cylinder
30 whose stroke is comparatively short, the length of the thrust of the tongue being equal to the stroke of the piston multiplied by twice the number of folds in either of the cables 30 33.

The piston is caused to reciprocate by air,
35 steam, hydraulic, or other suitable pressure, supplied from the auxiliary reservoir 35 by the inlet-pipe 34, and the reservoir is itself supplied from the main plant, which is as fully shown and described in my aforesaid applica-
40 tion, Serial No. 258,344. As shown, this pipe 34 has an elbow, 36, at the upper end of which is a two-way coupling having secured therein horizontal pipes 37 38, the former of which is made considerably smaller than the
45 other, for the purpose which will presently be described.

39 40 are downwardly-projecting pipes which are in communication with the ports of the cylinder, and also with one opening of the
50 valves 41 42, respectively, which valves are also in communication with the pipes 37 38, respectively, and are adapted to open communication between said pipes and the port-pipes 39 40. The valves have downwardly-project-
55 ing crank-arms 43 44, respectively, which are coupled together by a link, 45, pivoted to a push-bar, 46, which latter is pivoted to a vertical operating-lever, 47, located at the oper-
60 ator's post, whereby the operator may by operating the lever in one direction open communication between the feed-pipe and the port through one of the valves 41 42, and at the same time placing the other port in communi-
65 cation with one of the exhausts 48 49 through the other valve.

The pipes 37 38 are provided with valves

50 51, respectively, which are held normally open by springs 52 53, connected to the tracks 19 and to rods 54 55, respectively, which latter are connected to the crank-arms 56 of the said
70 valves.

The operation of this device is as follows: Supposing the parts of the engine to be in the position shown in Fig. 4 of the drawings, in which case the tongue 4 is withdrawn from
75 across the up and down tracks, so as not to interfere with the passage of the cross-grips, the operator at the crossing upon seeing a car approach from the other side pushes his lever 47 in the direction of the car, which operation
80 opens communication between the inlet and the port pipe 39 through the valve 41 and opens the other port with the exhaust. The pressure will now force the piston to the other head of the cylinder, drawing the sheaves 17
85 with it and lengthening the ropes between the said sheaves 17 and the sheaves 26, and causing the tongue to thrust forward between the rollers and transversely through the cross-tunnels as far as the sheaves travel multiplied
90 by twice the number of the traveling sheaves plus the distance that the traveling sheaves travel. This action places the ratchet on the end of the tongue under the grip on the car, whereupon the pawl 9 is caused to engage with
95 the ratchet, and now the operator at the crossing may draw the car across by operating the lever in the opposite direction, which will reverse the valves 41 42 and cause the pressure to drive the piston to the opposite end of the
100 cylinder. This action of course operates the tongue in the opposite direction; but as soon as the piston has nearly completed its stroke a projection or lug, 58, carried by the piston-rod, comes in contact with the end of the rod
105 55 and completely shuts off communication through the valve 51, and thus prevents the piston from knocking out the head of the cylinder and the pressure from building up in the same to a dangerous degree. The lug 57
110 performs the same function when the piston operates in the opposite direction to that last described. It is found that the piston when the tongue is disengaged from the car, would whip the said tongue across at too great a
115 speed, therefore, to obviate this, the pipe 37 is of comparatively small diameter, so as not to admit the pressure too rapidly, and this fault is further obviated by the employment of a governor, 59, which is supported by the
120 standard 23, the said governor deriving its motion from a bevel-gear on the sheave-pintle, the latter being keyed to one of the sheaves, when the centrifugal force raises the balls of the governor. The bell-crank lever 60
125 is operated, which pulls upon a rod, 61, connected to the crank-arm of a valve, 62, in the feed-pipe and thus regulates the pressure. This governor of course performs the same function when the engine is drawing the car
130 across.

The manner of reciprocating the tongue and

of reeving the sheaves with the cables is also shown and described in my application, Serial No. 258,346, and engines similar to that described herein are shown and described in the same application, and also in application, Serial No. 258,351.

The pivoted standards have a spiral spring, 63, coiled around their shaft or pivot 64 and bearing at one end against one of the standards and at the other against the block or a stationary part of it for the purpose of keeping the cables 30 33 normally taut. The block to which these standards are pivoted has a semicircular ratchet, 64, thereon, with which engages a pawl, 65, pivoted to the standard, so that when the cables give the spring will take up the slack and the pawl will engage in a new notch and hold the sheaves against movement in the opposite direction, as also shown and described in my application, Serial No. 258,346, filed herewith.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a cable railway at a crossing or junction, the combination, with the cable-tunnel of the lower cable and the tunnel of the upper cable, of pulleys or rollers supported in the tunnel of the lower cable in a line across the upper cable, and a tongue or strip supported and guided by said rollers and adapted to project across the upper cable, as set forth.

2. The combination, with the tunnel, of a series of grooved pulleys supported one above the other in said tunnel, a tongue or strip supported between said pulleys, and a ratchet or rack on said tongue, substantially as set forth.

3. The combination, with the tunnel, of brackets secured one above the other therein, and grooved pulleys mounted vertically on said brackets, a tongue or strip supported by said pulleys and guided by said grooves, and a ratchet-bar secured to the side of said tongue, the said tongue being pointed, substantially as and for the purposes set forth.

4. The combination, with a cylinder having a piston-rod projecting from both ends thereof, of the grooved pulleys, a tongue or strip supported by said pulleys, a ratchet-bar secured to said tongue near its end, fixed sheaves fore and aft of said cylinder, cables connected with the piston-rods, passing around said sheaves and secured to the tongue, and a groove or channel in the said tongue for the reception of one of said cables, substantially as and for the purposes set forth.

5. The combination, with the tunnel, of pulleys or rollers supported therein, and a rigid tongue or strip supported and guided by said pulleys or rollers, cables secured to the same end of said tongue, and sheaves arranged out of the plane of said pulleys and remote from each other, over which the said cables pass, substantially as set forth.

6. The combination, with the grip of a cable-railway car, and a reciprocating tongue, 4, having a rack thereon, of a pawl pivoted to said grip and adapted to engage said rack, a counter-balance for holding said pawl normally aloof, and a rod connected to said pawl, whereby it may be caused to engage and disengage said rack, substantially as set forth.

7. The combination, with the cylinder having a piston and a piston-rod projecting from both ends thereof, of brackets on the ends of said rods, a series of sheaves mounted in said brackets, stationary sheaves located fore and aft of said cylinder and in number equal to the sheaves in said brackets, a track, a tongue or strip supported by said track, and cables connected with each piston-rod and to the tongue and rove on the fixed and traveling sheaves at both ends of the cylinder, substantially as and for the purposes set forth.

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Witnesses:

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