(No Model.)

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W. GROSVENOR.

TRANSPORTATION SYSTEM.

No. 606,284. Patented June 28, 1898.

Fig. 1.

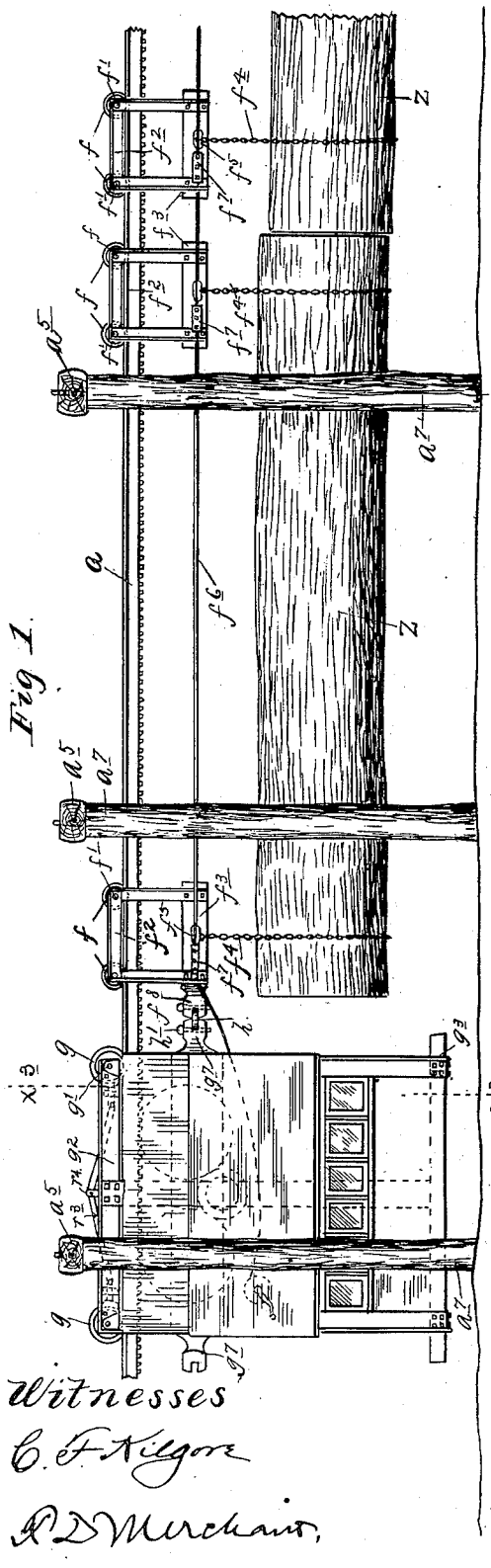
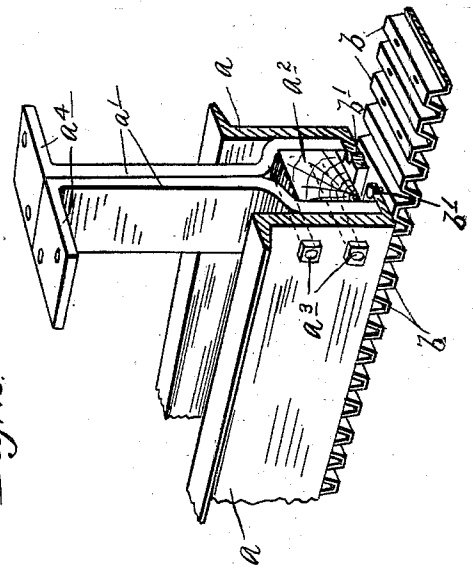


Fig. 2.



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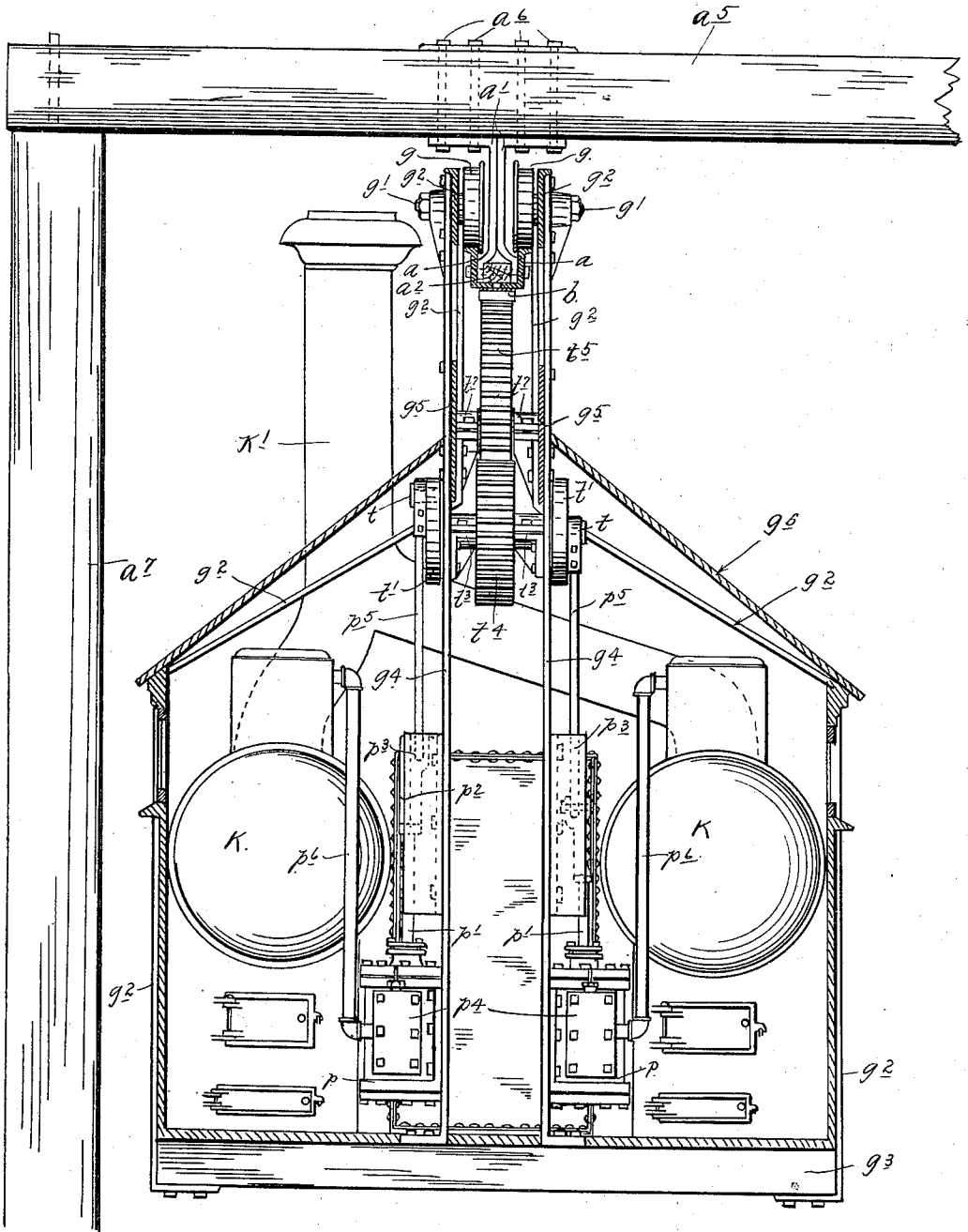
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Fig. 3.



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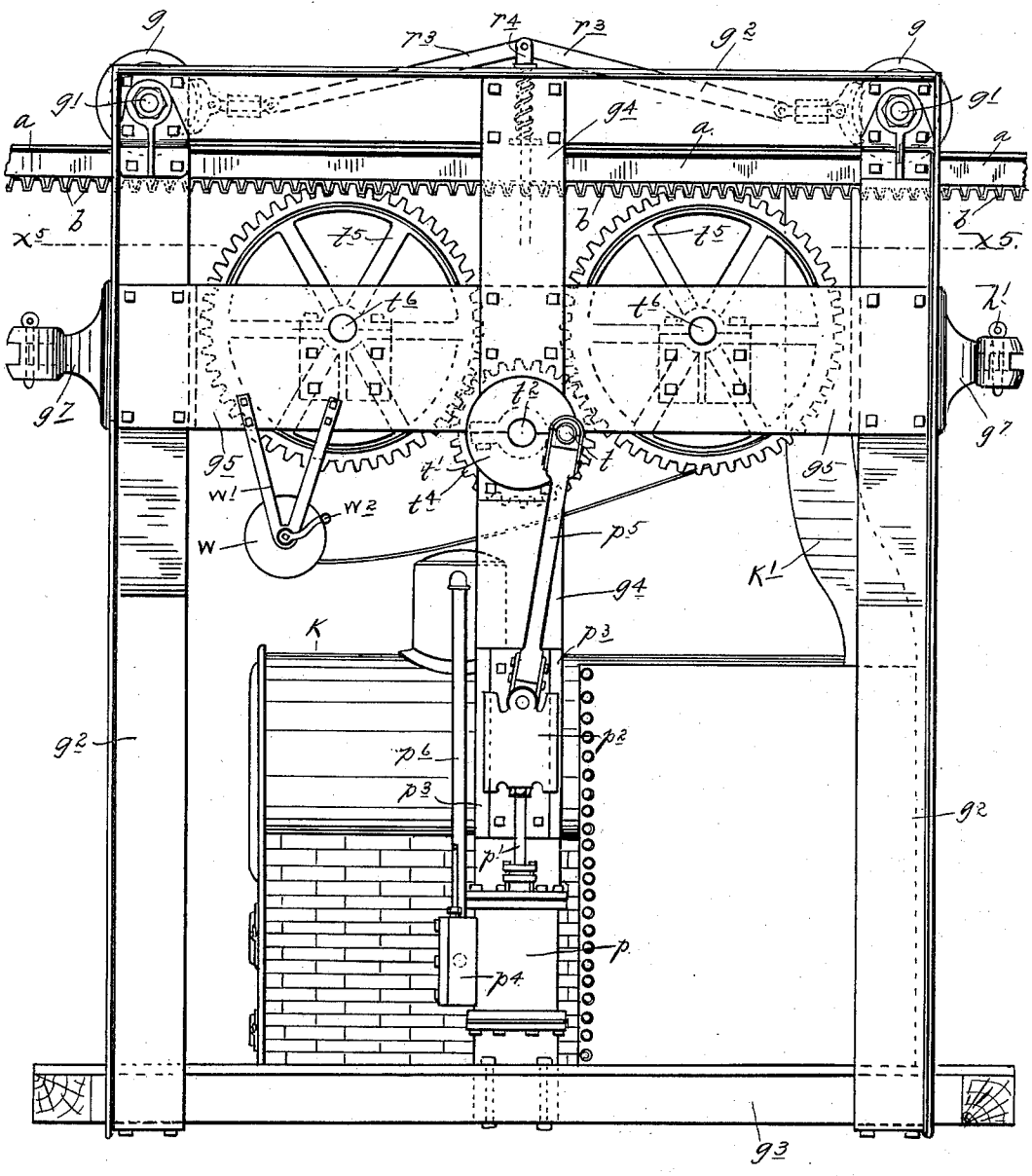
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Fig. 4.



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TRANSPORTATION SYSTEM.

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Fig. 5.

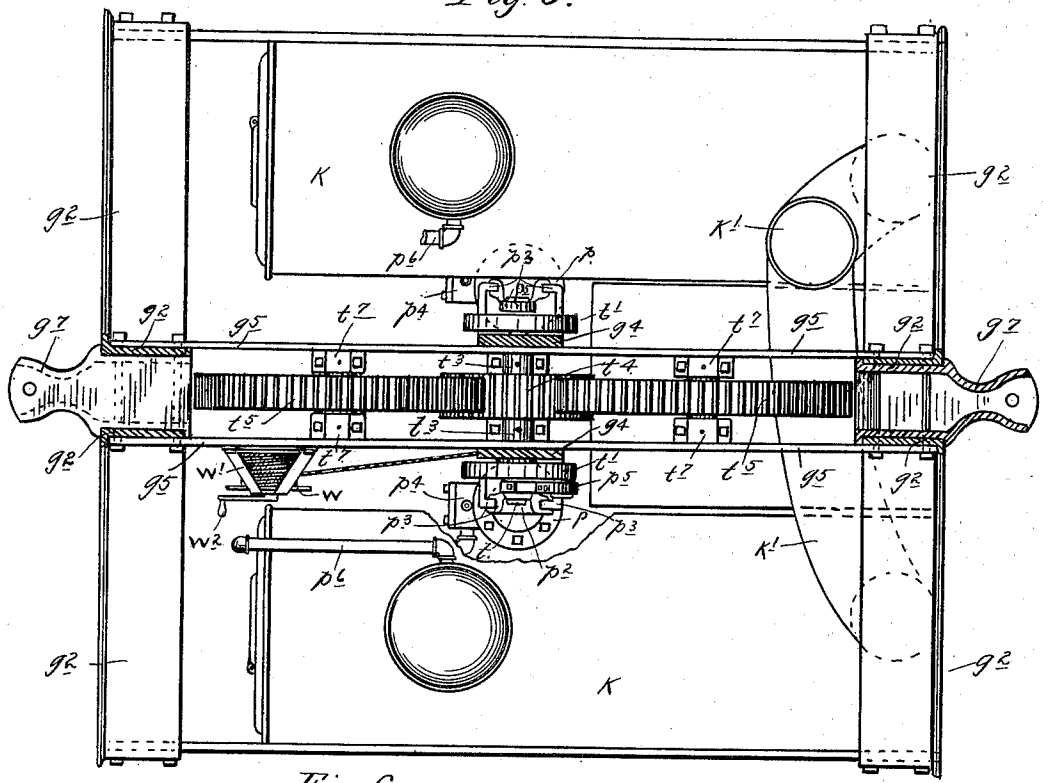
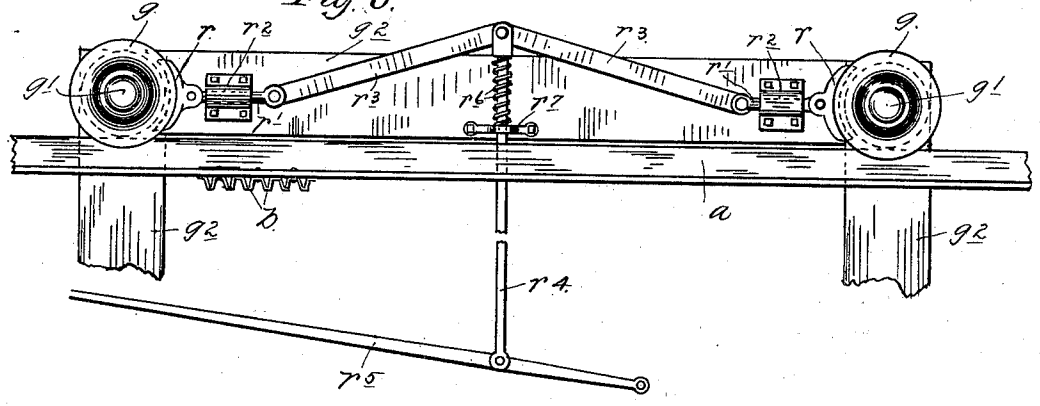


Fig. 6.



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UNITED STATES PATENT OFFICE.

WALLACE GROSVENOR, OF CASSELTON, NORTH DAKOTA.

TRANSPORTATION SYSTEM.

SPECIFICATION forming part of Letters Patent No. 606,284, dated June 28, 1898.

Application filed September 17, 1897. Serial No. 652,027. (No model.)

To all whom it may concern:

Be it known that I, WALLACE GROSVENOR, a citizen of the United States, residing at Casselton, in the county of Cass and State of North Dakota, have invented certain new and useful Improvements in Transportation Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved transportation system especially adapted for transporting logs. This system was especially designed and is especially adapted to meet the conditions of heavy-timbered country, such as is found on the Pacific coast. For this class of work it is essential to the practical success of the system that the railway or track be such that it may be quickly and cheaply laid over the rough and unbroken surface of the ground.

To the ends above noted my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

My invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation, showing a portion of my improved railway and showing the engine or motor with a train of logs and log-carriages attached thereto. Fig. 2 is a perspective view, with some parts broken away, showing a section of the track-rails and brackets for supporting the same to the overhead supports. Fig. 3 is a transverse vertical section taken substantially on the line X^3 X^3 of Fig. 1. Fig. 4 is a side elevation, with some parts removed and others broken away, showing the engine or motor and a short section of the supporting-rails. Fig. 5 is a horizontal section through the engine or motor, substantially on the line X^5 X^5 of Fig. 4; and Fig. 6 is a detail view in side elevation, with some parts broken away and others removed, showing the top portion of the car and a short section of the supporting-rails.

a represents the rails, which are preferably of steel angle-iron bars, secured to overhead supports in parallel arrangement. The said rails *a* are bolted fast to the lower ends of bracket-irons *a'*, with their inner surfaces abutting against said bracket-irons *a'*, with their lower flanges turned inward, and with their upper flanges turned outward. The said bracket-irons *a'* face each other and are bent outward a short distance above their lower ends, so as to embrace a spacing-block a^2. Bolts a^3 extend through the rails *a*, bracket-irons *a'*, and the spacing-block a^2, and thereby serve to rigidly connect all of said parts together. At their upper ends the bracket-irons *a'* are turned outward to form horizontal feet or sections a^4. The feet a^4 of the brackets *a'* are rigidly secured to horizontal overhead supports a^5 by means of nutted bolts a^6. The overhead supports or timbers a^5 rest upon and are rigidly secured to upright timbers or projecting piles a^7, which rise from the ground and have their lower ends firmly embedded therein. The uprights a^7 are suitably spaced apart crosswise of the roadway, and the overhead cross-ties a^5 are of the proper length to afford sufficient clearance for the engine or motor, to be hereinafter described.

The parts just described constitute the track-support or roadway. The parts a^5 and a^7 may be made from rough timbers, which are usually available along the line of road. The piles or supports a^7 must of course in all cases project from the ground to such an altitude as to give clearance between the bottom of the suspended engine or motor and the ground. They may, however, be of much greater length than required for this purpose, so as to keep the track as nearly on a level as may be possible or to give the track a gradual incline. Secured to the inturned lower flanges of the rails *a* and running the entire length of the roadway is a wide-faced rack *b*. As shown, this rack *b* is of shell-like form, or, in other words, is formed by a corrugated strip of metal, which is secured to said bottom flanges of the rails *a* by means of rivets *b'*.

On the elevated track just described are mounted suitable trucks, which are connected together by suitable rods or connections and are coupled to and drawn by a locomotive or motor suspended by and running on the track-rails. These trucks are all of substantially the same construction and a pair of the same are employed to support each log of the train.

The said trucks are each provided with four flanged wheels f, with the two members on the same side traveling on the same upper flanges of the rails a. The said truck-wheels f are mounted on stub-axles f', fixed to and projecting inward from the four corners of the side frames f^2 of the trucks. These side frames f^2 are substantially of inverted-U shape, and the lower extremities of their legs or prongs embrace and are secured to body portions f^3. With this construction and mounting of the truck the wheels f traverse the rails a with a central clearance for passing the brackets a'. The said frames f^2 embrace the truck, and the body portion f^3 is supported by said frames directly below the track. A suitable supporting-chain f^4 is carried by and suspended from each truck. One end of the chain f^4 is rigidly secured to said truck, while the other end of the same is detachably connected thereto by a suitable grip f^5. The logs z are suspended or carried each by a pair of the said trucks and a pair of said supporting-chains f^4, as best shown in Fig. 1. The different trucks which make up the frame are connected together by means of a flexible connection f^6, which is adjustably secured to said trucks by means of suitable grips f^7.

The construction of the engine or locomotive which is used to draw the train will now be described.

The truck which suspends the locomotive or engine from the overhead rails involves four flanged truck-wheels g, which are mounted on trunnions g', that project inward from vertically-depending inverted-U-shaped frames g^2. This truck $g\ g'\ g^2$ is very similar in construction to the truck $f'\ f^2\ f^3$, but is, of course, much larger in all respects and much stronger. To the lower ends of the arms or prongs of the frames g^2 a lower platform g^3 is rigidly secured. This platform g^3 constitutes the bottom of the locomotive-cab. The frames g^2 are bent out laterally on the opposite sides of the truck and then are turned downward over the sides of the cab and are secured to the bottoms of the same. As shown, a pair of parallel vertical supports g^4 are secured at their upper ends, one to the central portion of each U-shaped frame g^2, and at their lower ends are secured to the platform g^3. A short distance below the rails a and rack b a locomotive-truck is also provided, with a pair of parallel longitudinal draw bars or plates g^5, which are secured at their central portions to the vertical supports g^4 and at their ends to the U-shaped frames g^2. This construction gives a very rigid frame for supporting and carrying the boilers and propelling engine or engines or other motive-power device. This locomotive-truck frame carries the cab g^6, which is built up from the platform g^3, with its roof terminated a considerable distance below the line of the rails a. The cab g^6 is a great deal wider than the truck which carries the same, but is of such dimensions that it will pass with ample clearance between the piles or supporting-timbers a^7 and above the surface of the ground.

A pair of coupler-heads g^7 are securably bolted or otherwise secured between the depending arms of the U-shaped frames g^2 and between the ends of the draw bars or plates g^5. The head member of the log-carrying trucks $f\ f'\ f^2$ is provided with a coupler-head f^8, which is similar in construction to the couplers g^7 on the engine-truck. The couplers f^8 and g^7 are adapted to be coupled together in the ordinary manner by a link h and pins h'.

k indicates a pair of boilers located one on each side of the engine-truck, within the cab g^6. As shown, these boilers k are both connected to a stack k', which extends through the top of the cab and terminates below the line of the cross-supports a^5 of the fixed structure. A pair of upright engines are secured within the cab, one on each side of the same. As shown, these engines comprise each a cylinder p, piston p', cross-head p^2, cross-head guide p^3, steam-chest p^4, and link or rod p^5. The cylinder p and cross-head guide p^3 are shown as rigidly secured to the intermediate vertical support or beam g^4, which stands on that side of the truck. The steam-chests are in communication one with each of the boilers k through steam-pipes p^6. The engine and boiler just described may of course be of any suitable construction. The upper ends of the links or rods p^5 are connected by pins t to crank-disks t', both of which crank-disks t' are rigidly secured to the projecting ends of a short counter-shaft t^2. This shaft t^2 is mounted in suitable bearings t^3, secured on the inner surfaces of the vertical tie-bars g^4, and projects through suitable passages formed in said bars g^4. At its central portion the shaft t^2 is provided with a small spur-wheel t^4.

t^5 indicates a pair of large spur-wheels, which, as shown, are secured on short shafts or spindles t^6, mounted in bearings t^7, rigidly secured to the draft-bars g^5. These gears t^5 are both in mesh with the small spur-gear t^4 and with the continuous rack b, which extends along the roadway beneath the rails a. Hence it is obvious that when the engine is thrown into action, so as to cause the spur-wheels t^4 and t^5 to revolve, the cab or motor will be caused to travel in one direction or the other, according to which way the engines are run.

The locomotive-truck wheels g are subject to the action of brake-shoes r, secured on the outer ends of plungers r', mounted in keepers r^2, secured on the horizontal portions of the U-shaped frames g^2. The inner ends of the plungers r' are connected by a toggle-lever r^3. The toggle-lever r^3 is operated by a vertical plunger-rod r^4, connected thereto and extending downward and into the cab. An operating-lever r^5, pivoted within the cab and connected to the lower end of said plunger

r^4, serves to move the toggle-lever r^3 toward its dead-center to apply the brakes. The toggle-lever r^3 is, however, normally held in its buckled position, as illustrated in Fig. 6, by means of a spring r^6, coiled on the plunger r^4 and compressed between the head of said plunger and a guide-lock r^7, fixed on one of the frames g^2. As is obvious, when the brake-shoes are set against the truck-wheels g the motor or cab will be frictionally locked to the rails a.

The forward end of the flexible connection f^6 is preferably extended to a considerable length and is wound upon a reel w, mounted in a bracket w', secured to the motor truck or cab frame, within the cab. This reel is preferably provided with a hand-clamp w^2, by means of which the reel may be operated to wind up or let out the cable f^6, as may be necessary to make up a longer or shorter train.

As stated in the introduction to this case, this transportation system was especially designed to meet the conditions and requirements of a quickly and cheaply constructed road for transporting logs over rough timbered country. On the heavily-timbered and mountainous western coast of this continent a road of this kind must be laid with very steep grades. Hence an ordinary traction locomotive or engine would be inadequate as a propelling power in a system adapted to climb mountainous inclines, for example. It is, however, thought to be perfectly obvious that the rack and spur-wheels, in virtue of their positive or non-slipping engagement, adapt the locomotive to climb up the steepest grades without danger. The roadway and overhead supports may be quickly laid over rough and irregular ground at a small cost in comparison with the cost of systems employing ground-bedded tracks.

It will be understood, of course, that various alterations in the specific details of construction above set forth may be made without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a transportation system, the combination with overhead supports of a pair of rails secured to said supports, an extended rack secured to said rails, a truck constructed to straddle said rails and provided with a pair of wheels engaging each rail, a cab or support suspended from and carried by said truck, a pair of gear-wheels mounted on said truck and engaging said rack, an intermediate gear engaging both of said gear-wheels, cranks on a common shaft, with said intermediate gear, and a pair of engines in said cab or on said support, connected one to each of said cranks, substantially as described.

2. In a transportation system, the combination with overhead supports and a rail or rails supported thereby, of a train made up of trucks mounted on and suspended from said rails, and a flexible connection connecting the several trucks, and a reel carried by the motor member of said trucks, on which said cable or flexible connection is wound, substantially as described.

3. In a transportation system, the combination with overhead supports, and a rail or rails supported thereby, of a motor-truck mounted on said rail or rails, a cab or support suspended and carried by said truck, and a brake involving brake-shoes engaging the advance and rear wheels of said truck and connected by a toggle-lever, a lever for operating said toggle, and a spring acting on said toggle and normally holding said shoes in inoperative positions, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WALLACE GROSVENOR.

Witnesses:
S. A. MOORE,
N. B. FITCH.