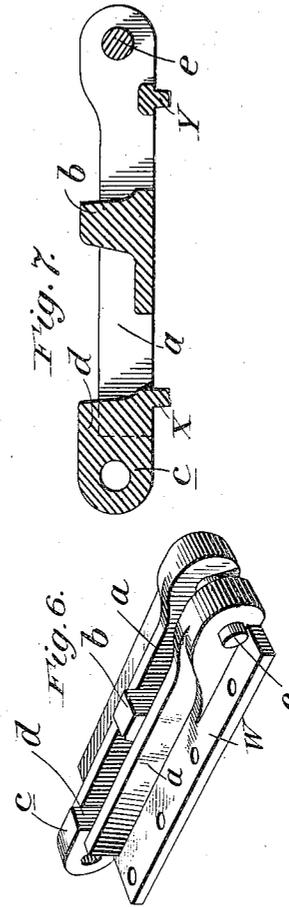
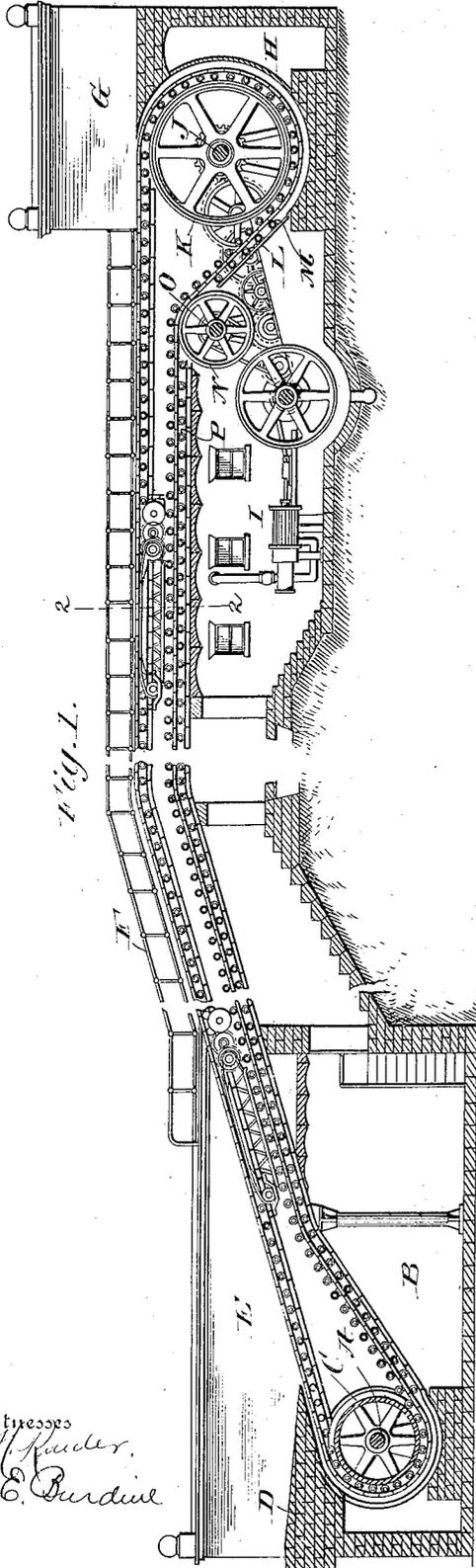


No. 812,374.

PATENTED FEB. 13, 1906.

I. D. SMEAD.  
MOVABLE ROADWAY.  
APPLICATION FILED MAY 24, 1904.

5 SHEETS—SHEET 1.



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5 SHEETS—SHEET 2.

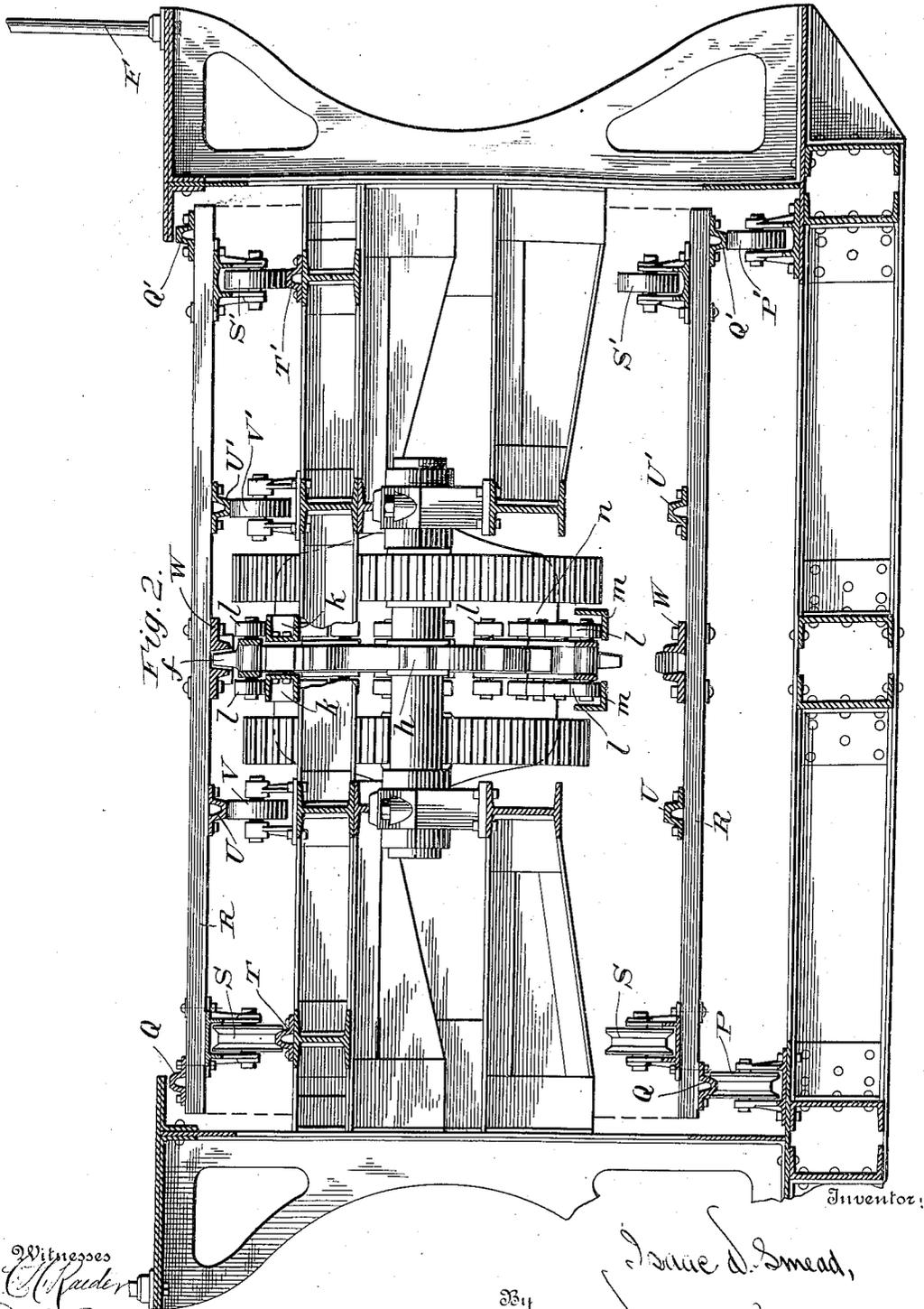


Fig. 2.

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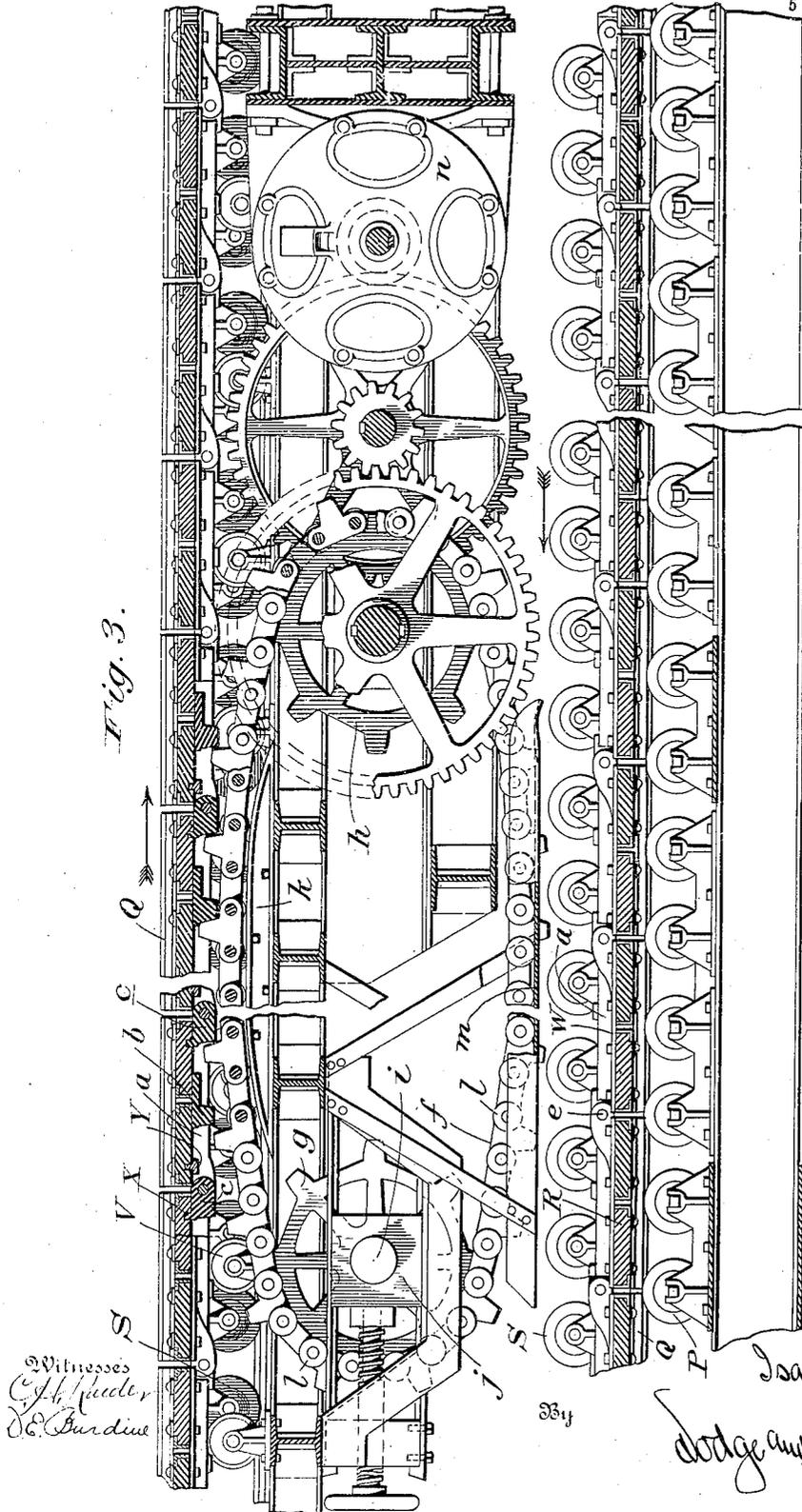
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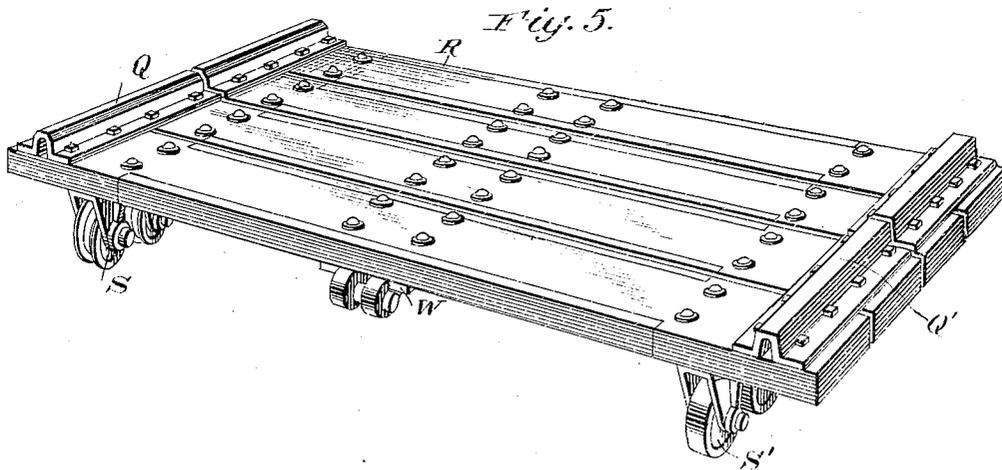
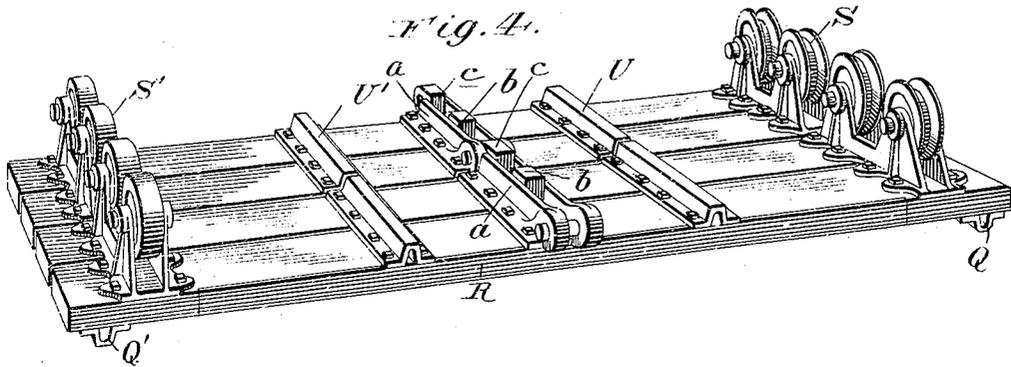
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APPLICATION FILED MAY 24, 1904.

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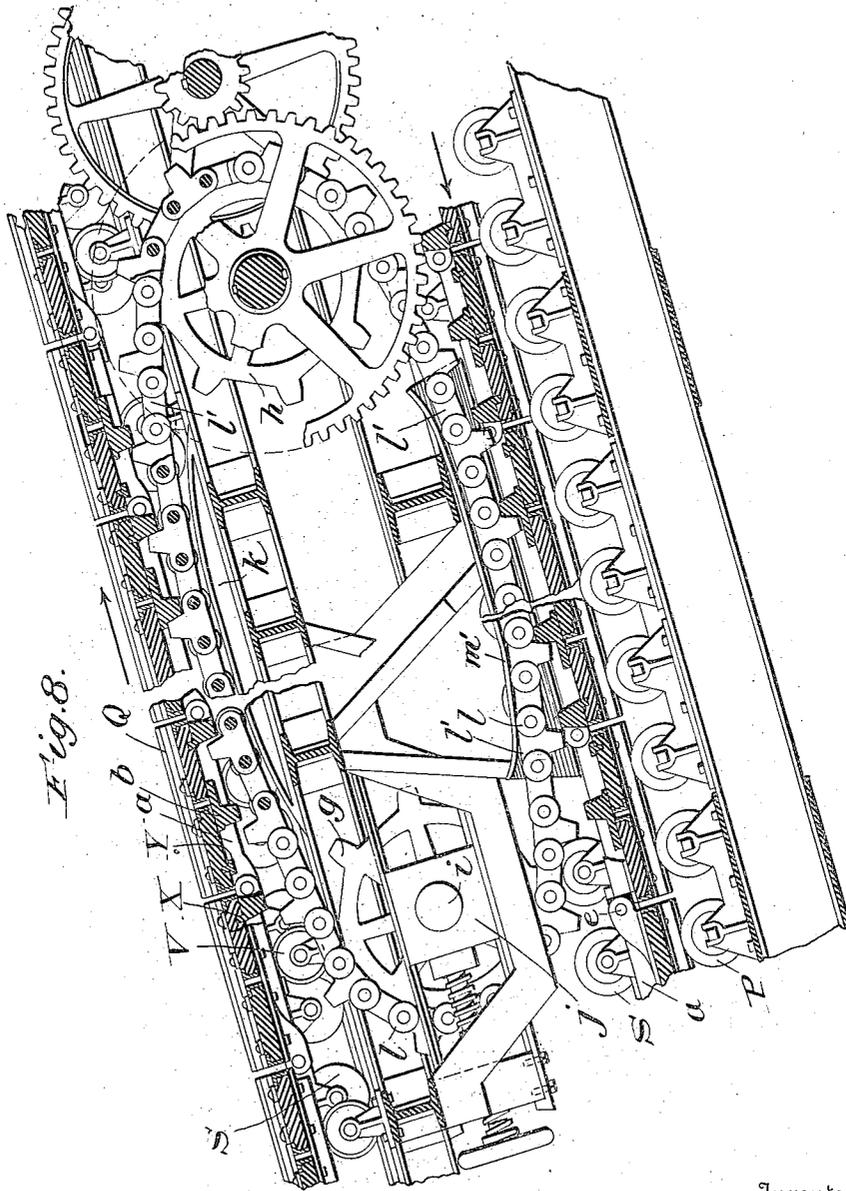
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# UNITED STATES PATENT OFFICE.

ISAAC D. SMEAD, OF CINCINNATI, OHIO, ASSIGNOR TO BURTON A. SMEAD, OF CINCINNATI, OHIO.

## MOVABLE ROADWAY.

No. 812,374.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed May 24, 1904. Serial No. 209,554.

*To all whom it may concern:*

Be it known that I, ISAAC D. SMEAD, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Movable Roadways, of which the following is a specification.

My present invention pertains to improvements in movable roadways, the construction and advantages of which will be hereinafter set forth, reference being had to the annexed drawings, wherein—

Figure 1 is a side elevation of the movable roadway, portions of the supports and the like being broken away to more clearly illustrate the invention. Fig. 2 is a transverse sectional view on the line 2 2 of Fig. 1; Fig. 3, a longitudinal sectional view of a portion of the mechanism, showing one of the auxiliary driving devices or motors; Fig. 4, a perspective view of a section of the movable platform as seen from the under side; Fig. 5, a similar view showing the upper face thereof; Fig. 6, a perspective view of one of the plates or members of which the driving or sprocket chain is composed; Fig. 7, a longitudinal sectional view thereof; and Fig. 8, a longitudinal sectional view of a portion of the driving mechanism, showing a modification of one of the auxiliary devices or motors.

The main object of my invention is to provide means for transporting loaded vehicles from one point to another, particularly from the base of a hill or incline to the top thereof.

A further object is to so construct the apparatus that a loaded team or vehicle may be driven or drawn onto the movable carrier without causing any damage to said carrier and without subjecting the team or its attendant to liability of injury.

Another object of the invention is to lessen the amount of work required of the main driving-engine to a considerable extent and likewise relieve the connecting members of the platform from undue strain, which would be produced were the power for moving the same applied at one point only. These ends are accomplished by the use of means distributed throughout the length of the movable platform for aiding or assisting in driving said platform.

In the accompanying drawings I have shown a simple embodiment of my invention, though it is manifest that the construction

may be varied in many of its details without departing from the spirit thereof.

The invention consists, broadly stated, in providing an endless platform, the lower loop or bend of which is located at the bottom of the incline or hill, while the upper loop or bend is placed at the crest of the hill. The upper stretch of the platform may lie flush with the street or roadway or be placed upon an elevated structure—such, for instance, as that shown in Fig. 1 of the drawings—or the entire belt may be flush with the road, all machinery being under ground when there are no streets to be crossed. Disposed throughout the length of the path of travel of the platform is a series of auxiliary motors, which, as before noted, apply power to the platform at various points throughout its length. Said platform is composed of a series of sections or bars hinged together and provided with means whereby it may be engaged by the main motor and the auxiliary motors. Each section is also provided upon its under face with one or more rolls, which serve to support the upper stretch of the platform, and with tracks or rails located upon each face thereof, one series of tracks serving likewise to assist in supporting the upper stretch of the roadway or platform, while the other series or that upon the upper face of the sections serves to support the return or under stretch during its reverse travel or descent.

In the embodiment of the invention shown in Figs. 1 to 7, inclusive, of the accompanying drawings, A denotes a shaft located in a pit B, formed at the lower end of the incline or hill, said shaft carrying suitable drums or sheaves C to properly support the movable platform at this point. As will be seen upon reference to Fig. 1, the upper face of the platform is in line with the driveway D, so that a team may pass onto the upper face of the platform without appreciable jar or jolt. It will be noted that said driveway D is given a slight downward inclination toward the platform, and consequently as the team reaches the latter the wagon will crowd slightly upon the horses, thus preventing the team from being subjected to undue strain or jar. With an elevated structure, such as shown, a wall E will be constructed at each side of the platform, so that entrance thereto can be had only from the driveway D. A

suitable railing F or other protection will be provided throughout the length of the platform upon each side of the elevated structure in order to prevent any possibility of teams or vehicles passing off the platform except at the upper end thereof between the walls G.

A power-house H is preferably located at the upper end of the incline or hill, said house being built beneath the elevated structure, or the driving mechanism may be located in a pit if the elevated structure be not employed.

It is of course not essential that the main engine be located at the upper end or stretch of the platform, though this arrangement is adopted in the construction shown.

The driving mechanism comprises an engine I, which through suitable intermediate gearing imparts rotary movement to the shaft J. Said shaft carries suitable drums or sheaves K, around which the upper end of the articulated platform passes. An incline L, provided with suitable rollers M upon its upper face, is located adjacent to the drums or sheaves K and serves to deflect and guide the under or return stretch of the movable platform toward drums N, which are mounted upon a shaft O, the latter by preference being also driven by the engine I.

After traveling over the drums N the platform passes onto a series of rollers P P', located at close intervals throughout the entire return course of the platform. As will be seen upon reference to Fig. 2, each roller P is grooved, and the track-section Q, which is secured to the outer face of the platform member R, passes into the groove in said roller. The roller P', on the other hand, is provided with a flat face, and the track-section Q' simply bears thereon. Under this construction the platform will be guided by the rollers P P' and tracks Q Q', all binding being obviated. Secured to the opposite face of the sections R of which the platform is composed are rollers S and S', the rollers S being grooved similarly to rollers P and rollers S' having flat bearing-surfaces similar to those of rollers P'. These rollers S and S' rest upon tracks T and T', which extend beneath the upper stretch of the platform from the drums C to drums K. Tracks U and U' are also secured upon the under face of the platform and bear upon rollers V V', located in line therewith and secured to the beams of the elevated structure, as will be most clearly seen upon reference to Fig. 2.

Each pair of sections R is provided with a driving member of the form shown in Figs. 4, 6, and 7, said member having a base-plate W, on which are mounted two cross-bars or lugs X and Y, which, as shown in Fig. 3, pass into recesses formed in the under face of the members R. These lugs, in conjunction with the bolts which are passed through the base-plate, securely hold the driving members to

the platform. Each driving member is provided with upright flanges *a*, intermediate which and at the mid-length thereof is provided a tooth *b*. At one end of the member and in line with the space intermediate the flanges is an outwardly-extending perforate lug or projection *c*, the upright face *d* thereof serving as a driving face or tooth. The opposite end of each flange *a* is curved, as shown in Fig. 6, and between these curved portions the lug *c* of the adjacent driving member is passed and secured by a pin *e*. These members when connected together form, in effect, a sprocket-chain, which is securely fastened to the under or inner face of the platform. This chain will be passed around a suitable driving-sprocket mounted upon the shaft J, though, if so desired, the sprocket-drive may be omitted at this point and a friction-drive relied upon. It is obvious that any form of link which will properly connect the parts and serve as a means for driving the platform may be employed.

As before noted, auxiliary motors are placed at intervals throughout the length of the platform to assist in moving the same. In Fig. 1 two such auxiliary motors are shown, though of course any number may be employed. In said figure the main stretch or inclined portion of the platform is broken away; but it will be understood that the length of the same will govern the number of auxiliary motors employed. In Figs. 2 and 3 an auxiliary motor is shown, which comprises a sprocket-chain *f*, passing about sprocket-wheels *g* and *h*, the shaft or support *i* for the former being mounted in adjustable boxes *j*, so as to enable the proper tension to be put upon the chain.

To properly guide and position the chain *f*, the upper stretch of which is brought into contact with the teeth of the connecting members of the platform, two curved guides or supports *k* are secured upon the frame of the structure immediately below the upper stretch of said driving-chain *f*. As will be seen upon reference to Figs. 2 and 3, rollers *l*, which are secured to the outwardly-extended ends of the pivots of the driving-chain, bear upon these guides *k* and properly position the teeth of the sprocket-chain *f* with reference to the teeth of the connecting members of the platform. By this arrangement the strain is distributed over a number of teeth, both of the driving-chain *f* and those upon the under face of the platform.

Beneath the lower stretch of the chain *f* are supported two guides *m*, upon which the rollers *l* bear. These guides relieve the sprocket-wheels from a certain amount of weight to which they would otherwise be subjected and also prevent the chain (should it become slack for any reason) from interfering with the return stretch of the platform which is passing beneath the same.

Any suitable motive power may be applied to drive the sprocket *h*. An electric motor *n* is shown in Fig. 3, suitable gearing being interposed between said motor and the shaft, upon which the sprocket *h* is mounted. By the employment of an electric motor for driving these auxiliary power devices the operator at the power-station is enabled to stop them and also the main drive at any moment desired, as it may sometimes be found advisable to stop the platform momentarily while a team or load is passing onto the same. By the arrangement suggested this can be readily accomplished and the platform again put in motion.

It is to be understood, of course, that any other form of auxiliary drive may be employed in connection with this apparatus, that shown being merely illustrative. It is likewise apparent that instead of employing one series of connecting members for the various sections of the platform two or more series may be employed, being engaged by motors similar to those already described.

It is to be noted that the connecting members hereinbefore described in detail have a three-fold function, namely: They form a pivotal connection between the cross bars or members of the platform and a chain which connects the various members of the platform throughout its length and also serve as a means for driving the platform at the main station or power-house and at various auxiliary points throughout the course of travel of the platform.

In Fig. 8 a modification of the invention is shown wherein the lower stretch of the movable platform engages the auxiliary drive-chain and assists in moving said chain, provided, of course, the parts are in an inclined position. To effect the desired result, the drive-chain *l'* passes beneath the guide-plate *m'*, which carries it down, so that the teeth or projections of the links are engaged by the teeth upon the movable platform. This construction is advantageous whether the road be used on a level or in an inclined position, inasmuch as it will assist in driving the horizontal stretch of the movable platform.

Having thus described my invention, what I claim is—

1. In an apparatus of the character described, the combination of an endless platform; means for supporting the upper stretch of the platform throughout its length; means for supporting the lower stretch thereof; a main motor for driving the platform; and a series of auxiliary chain-motors arranged at various points in the length of the platform, said chain-motors engaging both the upper and lower stretches of the platform.

2. In an apparatus of the character described, the combination of an endless platform; a main motor for driving the same; and an auxiliary motor comprising an endless

chain provided with engaging teeth or projections, said auxiliary motor being located at a point intermediate the loops or ends of the platform and engaging the upper and lower stretches thereof.

3. In an apparatus of the character described, the combination of an endless platform; means for supporting the upper stretch of the platform throughout its length; means for supporting the lower stretch thereof; a main motor for driving the platform, said motor being located adjacent to the loop or end of the platform; and a series of auxiliary chain-motors also employed for imparting motion to the platform, said auxiliary motors being located at points intermediate the loops or ends of the platform and engaging the upper and lower stretches thereof, substantially as described.

4. In an apparatus of the character described, the combination of an endless platform; a main driving-motor; a series of auxiliary driving-motors; and means for starting and stopping the various motors in unison.

5. In an apparatus of the character described, the combination of an endless platform; means carried by one face of the platform for supporting the upper stretch thereof throughout its course of travel; track mounted upon the opposite face of the platform; and a support acting in conjunction with said track to sustain the lower stretch of the platform throughout its length.

6. In an apparatus of the character described, the combination of a suitable support; an endless platform comprising a series of jointed sections; means secured to the under face of said sections for properly supporting and guiding the platform throughout the length of its upper stretch; means upon the outer face of the platform for properly supporting and guiding the lower stretch thereof during its course of travel; and a motor for driving the platform.

7. In an apparatus of the character described, the combination of a suitable support or framework; an endless platform comprising a series of sections pivotally connected together; means for driving said platform; a series of rollers *S, S'* upon the inner face of the platform; tracks *T, T'* mounted upon the framework in line with said rollers; tracks *U, U'* likewise secured upon the inner face of the platform; a series of rollers *V, V'* in line with said tracks *U, U'*; tracks *Q, Q'* mounted upon the outer face of the platform; and rollers *P, P'* in line with said last-named tracks.

8. In an apparatus of the character described, the combination of an endless platform comprising a series of sections; a series of driving members secured to said platform-sections and pivotally connected to each other; a main motor for driving said platform; and a series of auxiliary motors disposed throughout the length of the platform,

said motors imparting motion to said platform through the driving members thereof.

5 9. In an apparatus of the character described, the combination of an endless platform comprising a series of sections; driving members secured to said platform and pivotally connected to each other; a main motor; and an auxiliary motor, said auxiliary motor comprising a sprocket-chain, one stretch of which engages with the driving members secured to the platform, and means for driving said sprocket-chain.

10 10. In an apparatus of the character described, the combination of an endless platform comprising a series of sections; driving members secured to said platform and pivotally connected to each other; a main motor; and an auxiliary motor, said auxiliary motor comprising a sprocket-chain, means for holding the upper stretch of said chain in engagement with the driving members, and means for imparting motion to said sprocket-chain.

15 11. In an apparatus of the character described, the combination of an endless platform comprising a series of sections; driving members secured to said platform and pivotally connected to each other; a main motor; and an auxiliary motor, said auxiliary motor

comprising an endless sprocket-chain, means for holding the upper stretch thereof in engagement with the driving members of the platform, means for guiding the lower stretch of the sprocket-chain, and means for imparting motion to said chain.

12. In an apparatus of the character described, the combination of an endless platform comprising a series of sections; driving members secured to said platform and pivotally connected to each other; a main motor; and an auxiliary motor, said auxiliary motor comprising an endless sprocket-chain, means for holding the upper stretch thereof in engagement with the driving members of the platform, means for guiding the lower stretch of said sprocket-chain and causing the same to engage the lower stretch of the endless platform, and means for imparting motion to said chain.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

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Witnesses:

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