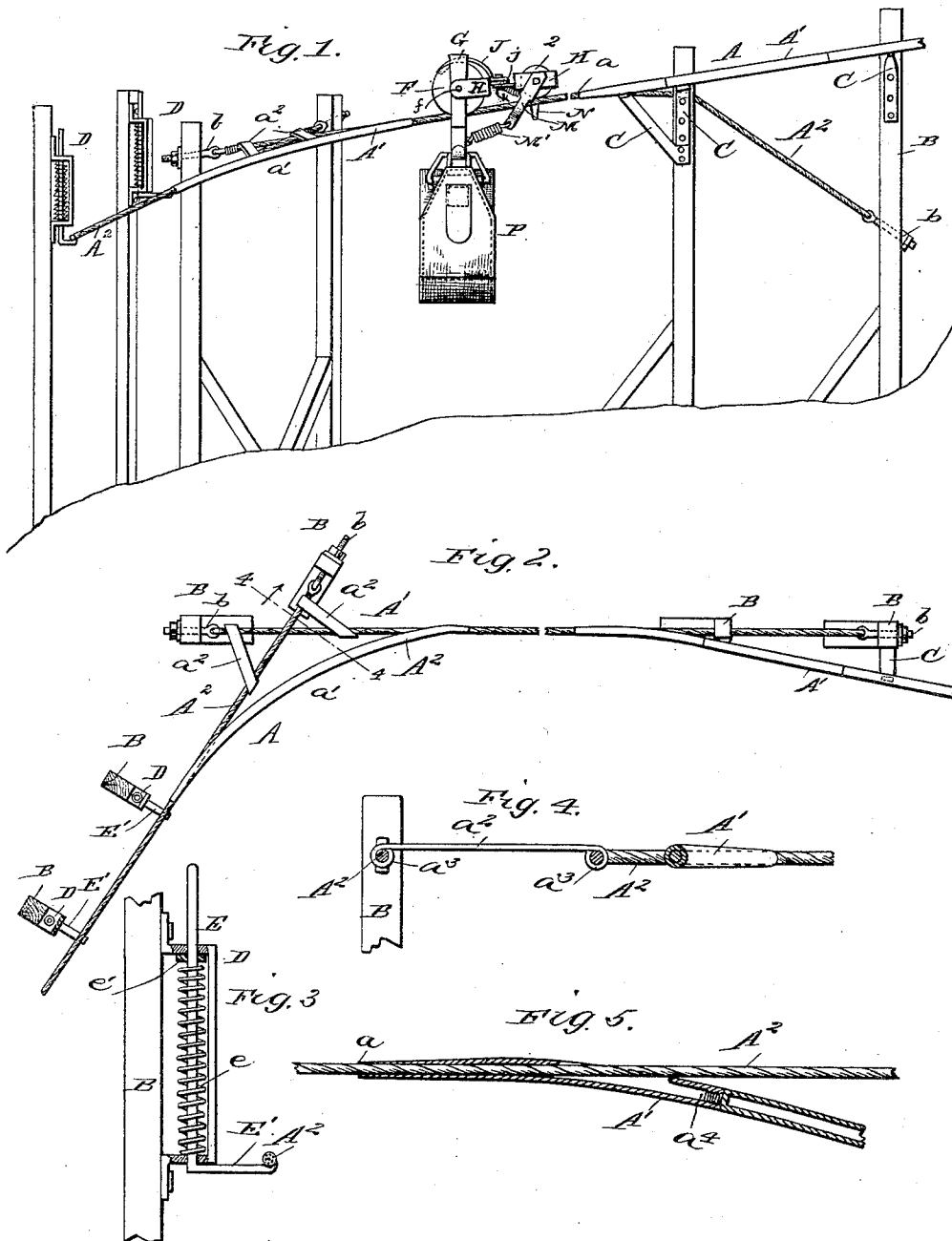


J. F. VINTON.  
TRAMWAY.

No. 453,095.

Patented May 26, 1891.



WITNESSES:

H. R. Davis.  
C. Sedgwick

INVENTOR:

J. F. Vinton  
BY Munn & Co.

ATTORNEYS

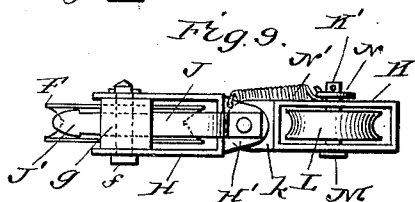
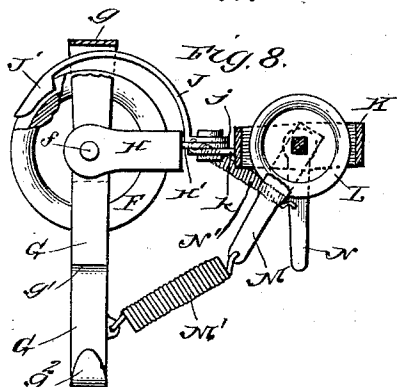
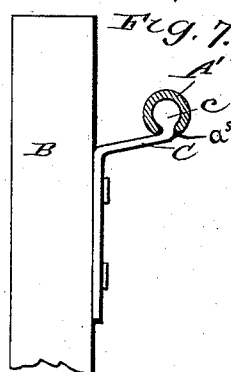
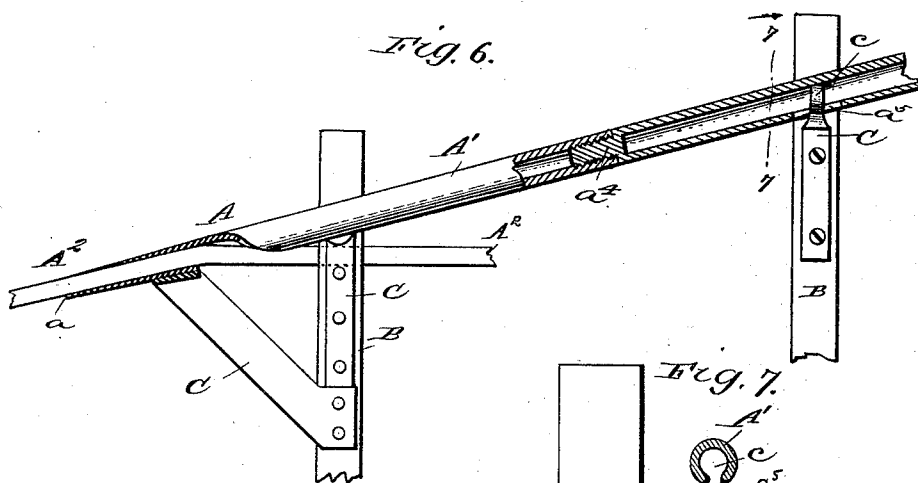
(No Model.)

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# UNITED STATES PATENT OFFICE.

JOHN F. VINTON, OF SPOKANE FALLS, WASHINGTON, ASSIGNOR OF ONE-HALF  
TO JOSEPH S. HAM, OF SAME PLACE.

## TRAMWAY.

SPECIFICATION forming part of Letters Patent No. 453,095, dated May 26, 1891.

Application filed November 18, 1890. Serial No. 371,797. (No model.)

*To all whom it may concern:*

Be it known that I, J. F. VINTON, of Spokane Falls, in the county of Spokane and State of Washington, have invented a new and Improved Tramway, of which the following is a full, clear, and exact description.

My invention relates to improvements in tramways, and is specially designed for carrying sacked ores and other material, being peculiarly adapted for use in mining where mines are located high in the mountains, which is usually the case, and where inclines are easily obtained to outlets in the valleys, such as streams, railroads, or refining-mills.

The object of the invention is to produce a simple, cheap, and convenient tramway, by means of which ores or other material may be conveyed by gravity; and to this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a broken side elevation of the tramway with the trolley and a loaded sack in position thereon. Fig. 2 is a plan view of the same, partly in section. Fig. 3 is a broken detail view of one of the spring-arms for supporting the track. Fig. 4 is a vertical cross-section on the line 4 4 of Fig. 2. Fig. 5 is a broken longitudinal section showing the manner in which the track-cable is connected with the track-tubes. Fig. 6 is an enlarged broken sectional view showing the connection between the track-cable and the tubes and also the means for connecting the tubes. Fig. 7 is a vertical cross-section on the line 7 7 of Fig. 6. Fig. 8 is a broken side elevation, partly in section, of the trolley. Fig. 9 is a plan view of the same.

The track A is composed, preferably, of a series of connected tubes A' and a cable A<sup>2</sup>, which is anchored at the ends, and which is made to pass through the ends of the tubes, although either the tubes or the cable may be used separately, if desired, without departing from the principle of my invention. The tubes A' are made strong enough to support the trolley, and the tubes are supported upon

the arms of vertical posts, as described below, the ends of the tubes being within, as shown at a, and the tubes having lateral openings near the ends, as best shown in Fig. 5, so that the cable A<sup>2</sup> may pass through the openings and out through the ends of the tube, the ends of the cable being secured to the bolts b on the vertical posts B, and as the ends of the tubes are thin there will be no jolting as the trolley passes from the tubes to the cable.

The posts B are provided with projecting arms C, which support the track, although the arms may be attached to trees or other suitable supports where such supports are convenient, and the tubes A' are preferably arranged upon the arms and also at points where the track curves, as shown at a'. Where there is a curve in the track, two cables are used, the cables being passed through the ends and side openings of the tubes, which may be curved to any desired extent, and the ends of the cable are fixed to bolts b in the vertical supports B, the supports being arranged behind the curved tubes, and the cables will thus cross each other, as best shown in Fig. 2, the cables being braced and supported near their point of intersection by the plates a<sup>2</sup>, which extend from one cable to another, the ends of the plates being bent around the cables, as shown at a<sup>3</sup> in Fig. 4.

The tubes A' are preferably united, as best shown in Fig. 6, by having one end of a tube provided with a projecting screw, as shown at a<sup>4</sup>, and having the end of the tube to which it is united provided with an internal thread to receive the screw. The tubes will thus be held firmly together and their outer surfaces will be on the same line. A convenient form of supporting the tubes is shown in Figs. 6 and 7, in which an arm C is fixed to one of the supports B, the arm having a flattened head c and the tube having an elongated opening a<sup>5</sup> on its under side to receive the head, and the arm is twisted so that the head may be inserted flatwise through the opening a<sup>5</sup>, and is then turned at right angles to the tubes and attached to the support, thus causing the head c to extend transversely across the inner opening of the tube, as is best shown in Fig. 7.

A cable A<sup>2</sup> is preferably used where a long

span is to be made or where a gulch is to be crossed, and to prevent excessive vibration the posts on opposite sides of the gulch or the long span are provided with frames D, and rods E extend vertically through the frames, so as to move therein, the lower ends of the rods being bent laterally to form the arms E', which support the cable, and the rods are each provided with a collar e', between which and the lower end of the frame D is a spiral spring e, the springs thus allowing the arms E' and rods E to yield, thus counteracting the tendency of the cable to vibrate.

The trolley which is used to run upon the track A has a wheel F, which is grooved to fit the track, and a carriage is formed of the bar G, which is bent over the wheel, as shown at g, one end extending down far enough to receive the pivot f of the wheel at the opposite end from the main portion of the bar, the pivot-pin extending through the end of the bar and through the opposite side or main section. The main portion of the bar G extends below the wheel F and is bent inwardly, as shown at g', so that the lower end of the bar, which is formed into a hook g<sup>2</sup> to carry the load, will be directly beneath the center of the wheel F.

A U-shaped frame H is pivoted to the wheel F by the pivot f, so as to embrace the same and the carriage and extends rearwardly therefrom, and at the end of the U-shaped frame is a projecting flange H', to which is bolted the end j of the spring J, the said spring extending over the top of the wheel and beneath the bend in the bar G and the end of the spring being formed into a brake-shoe J', which fits the groove of the wheel.

To the flange H' of the U-shaped frame H is hinged the flange k of the frame K, so that the frame may turn laterally, but cannot tip vertically on the flange H', and fixed in the frame K is a wheel L, which is grooved, as shown in Fig. 9, so that it will fit upon the track A. The wheel L is adapted to act as an additional brake, and it has a square hole in the center to receive the bolt K', so that it will not turn, and it may be taken out and given a quarter-turn or more in case it becomes worn on one side.

Fixed to the frame K on one side is a depending arm M, the lower end of which is connected by a spring M' with the depending bar G, the spring thus serving as an equalizer, so that when the trolley is running upon a slight incline the wheel L will press but lightly on the track, and when the trolley is running upon a steeper incline the tension of the spring will cause the wheel to press more firmly upon the track, and thus maintain a uniform speed of the trolley. On the opposite side of the frame K is pivoted a depending arm N, which extends below the track and serves as a guide to prevent the wheel L from leaving the track, the arm being connected by a spring N' with the flange H' of the frame H, so that when the arm is tilted

back by reason of striking one of the supporting-arms of the track it will be immediately pulled back to place by means of the spring.

A sack P is used for carrying materials, although any suitable sack may be used, and the sack is secured upon the hook g<sup>2</sup> of the bar G. The trolley is placed upon the track with the arm N next the supporting-post and with the wheel L in the rear or above the wheel F. The sack P is hooked to the trolley in the manner described, and the sack and trolley will be carried by gravity to a desired point at a lower elevation from that at which it is started.

The operation of the trolley is as follows: When traveling at a slight incline, it will run freely upon the track; but when the incline is steeper the tendency to increased speed is overcome by means of the brake J and the wheel L, for when the inclines grow steeper the wheel L and the rear end of the frame H are raised, and the friction is increased by the additional pressure of the wheel upon the track, as described above, and also by the spring J coming in contact with the top of the bar G, and thus forcing the brake-shoe J' against the wheel F.

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

1. In a tramway, the combination, with the track and the vertical supports, of frames secured to the supports and spring-pressed rods mounted vertically in the frames and having their lower ends bent to form supporting-arms for the track, substantially as shown and described.

2. In a tramway of the character described, the trolley comprising a wheel, a bar pivoted to the wheel and having a hook at its lower end, a frame pivoted on the bar, a frame hinged to the bar-frame and having a wheel fixed therein aligning with the pivoted wheel, and a spring connection between the frame of the fixed wheel and the lower portion of the bar, substantially as described.

3. In a tramway of the character described, the trolley comprising the wheel adapted to run upon the track, a bar doubled over the wheel and pivoted thereto, the lower end of the bar being formed into a hook, a U-shaped frame pivoted to the bar and extending rearwardly around the wheel, a frame hinged to the U-shaped frame, a wheel fixed in the hinged frame and adapted to fit the tramway-track, and a spring connection between the frame and the hook-bar, substantially as described.

4. The trolley comprising a wheel to run on the tramway-track, a bar pivoted to the wheel and having its upper end extending over the wheel and its lower end formed into a hook, a U-shaped frame pivoted to the bar and wheel, a frame hinged to the U-shaped frame and provided with a wheel to rest upon the track, and a spring fixed to the U-shaped

frame and extending over the wheel and beneath the main bar, said spring having its end formed into a shoe to fit the trolley-wheel, substantially as described.

5 5. The combination, with the trolley-wheel, the hook-bar doubled over the wheel and pivoted thereto, and the U-shaped frame pivoted to the bar and wheel and embracing the latter, of a frame hinged to the U-shaped frame  
10 and provided with a wheel adapted to rest upon the track, and a spring fixed to the U-shaped frame and extending over the wheel and beneath the hook-bar, said spring having

its end formed into a brake-shoe, substantially as described.

15 6. The combination, with the frame carrying the fixed wheel, said frame being connected with the main trolley-bar, as described, of a spring-pressed guide-bar pivoted to the frame and extending downward therefrom, 20 substantially as described.

J. F. VINTON.

Witnesses:

THOMAS D. GAMBLE,  
A. S. DIBBLE.