(No Model.)

A. J. B. BERGER.

ELEVATED RAILWAY OR CARRYING SYSTEM.

No. 307,425. Patented Nov. 4, 1884.

Fig. 1.

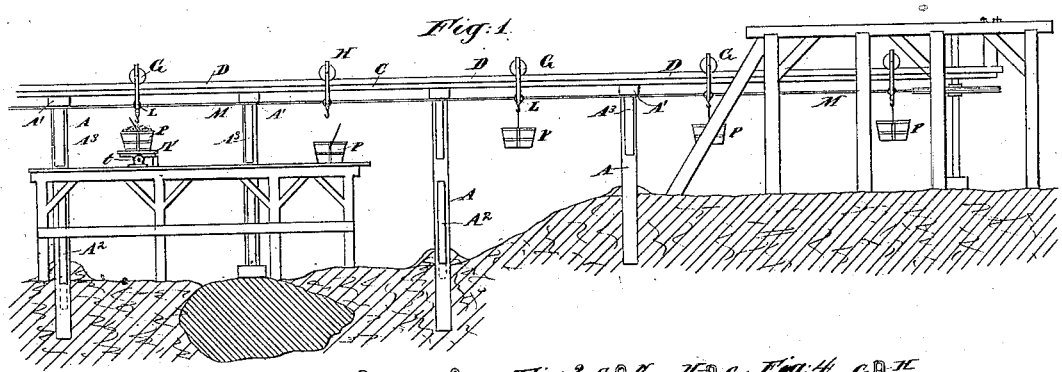


Fig. 2.

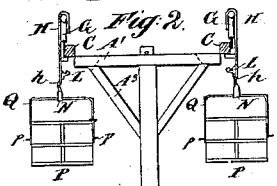


Fig. 3.

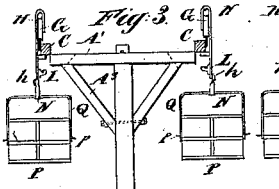
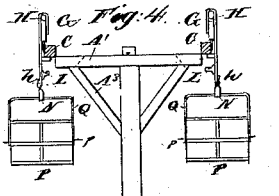


Fig. 4.



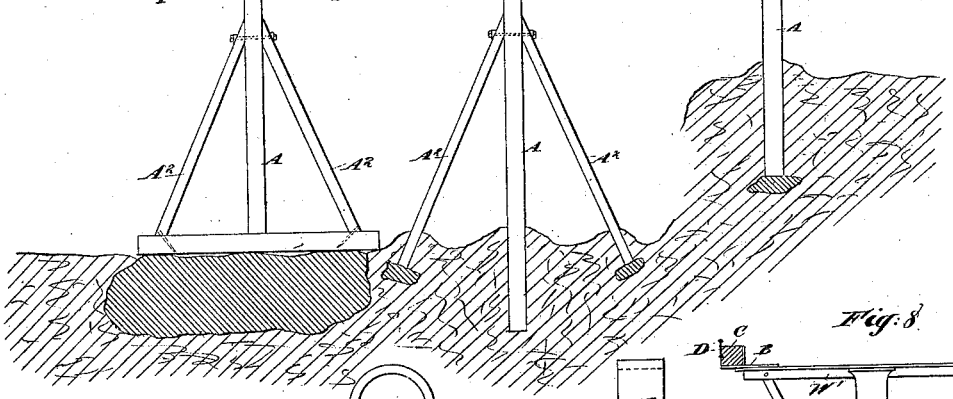


Fig. 8.

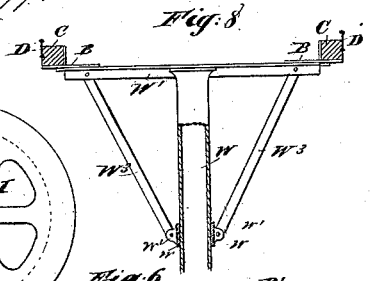
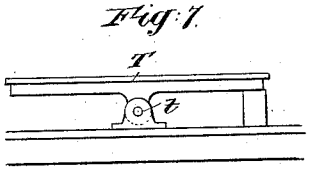


Fig. 7.



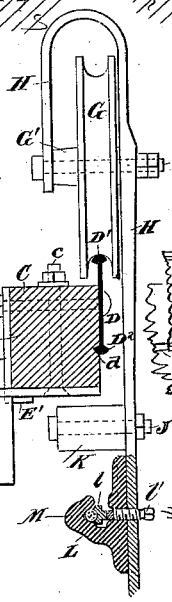


Fig. 6.

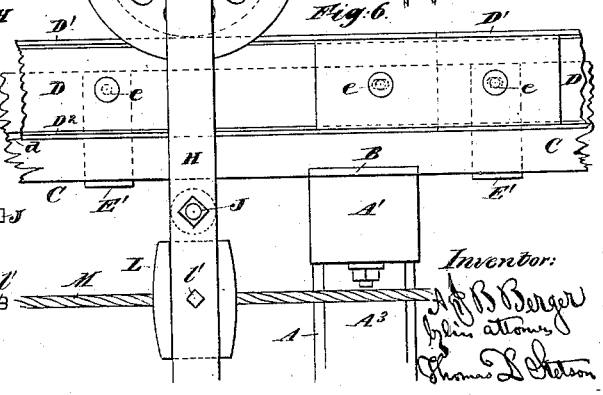
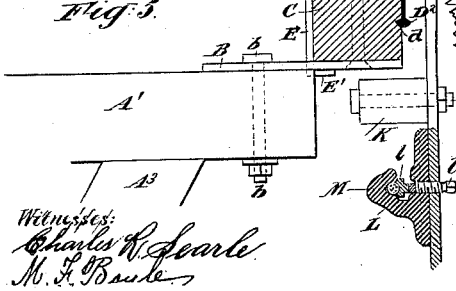


Fig. 5.



Witnesses:
Charles R. Searle
M. F. Beale

Inventor:
A. J. B. Berger
per attorney
Thomas D. Stetson

UNITED STATES PATENT OFFICE.

AMBROSE J. B. BERGER, OF EASTON, PENNSYLVANIA.

ELEVATED RAILWAY OR CARRYING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 307,425, dated November 4, 1884.

Application filed December 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, AMBROSE J. B. BERGER, of Easton, Northampton county, in the State of Pennsylvania, have invented certain new and useful Improvements Relating to Elevated Railways or Carrying Systems, of which the following is a specification.

The invention applies to all that class of elevated railways in which earth, ore, or other material is carried in suitable buckets or receptacles suspended from an elevated rail. The motive power is usually applied by an endless rope operated by a steam-engine at one end or at some other convenient point on the carrying system.

My present invention consists in improvements in the details, which will be fully described below.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a general side elevation of one end of the line. The remaining figures are on a larger scale. Fig. 2 is a cross-section showing the construction where it passes over rock or impervious strata. Fig. 3 shows the same on softer ground, into which timbers can be inserted by driving or otherwise. Fig. 4 shows the construction where the track is only seven feet or less above the ground. The remaining figures are on a still larger scale. Fig. 5 is a cross-section of a portion. Fig. 6 is a side view of the same. Fig. 7 is a side view of the tilting platform. Fig. 8 shows a modification. It is a cross-section of the upper portion of the track.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is an upright post; A′, a cross-piece fixed thereon, and B B extensions of flat wrought-iron or steel. These extensions support longitudinal timbers C, which I term "stringers." They are grooved along their outer faces at about the mid-height, *d*, to receive the lower flange of a double-flanged rail, D, D′, D^2, of which latter D is the web or main body, and D′ D^2 the thickened edges, which I term the "heads." The rail is mounted with one head, D′, elevated considerably above the top of the timber C. The lower head, D^2, is received in the groove *d*.

E E′ is a flanged plate of iron of a depth about equal to that of the stringer C. The flange E′ lies under the timber. It is recessed into the timber. It may extend along the whole length of the stringer; but it will usually be sufficient to have narrow pieces applied, one for each cross-bolt, *e*, extending through and engaging the rail. In locating them care should be taken to avoid the short spaces occupied by the several arms B. The upright A is braced by diagonal braces A^2 A^2. The cross-piece A′ is braced by diagonal pieces A^3 A^3, all being held by suitable bolts. The flat arms B are held by bolts *b*. The timbers or stringers C are confined to B by bolts *c*, which latter have conical heads let up into conical recesses in the arms, as indicated in the drawings, so that the lower face of B where it extends out beyond A′ is plane and clear to allow the traverse of a wheel or roller thereunder, as will appear further on. The rails D are secured to the timbers C and flanged plates E E′ by bolts *f*.

G is a grooved wheel adapted to traverse on the uppermost head, D′, of the rail. Its hub G′ is elongated on one side more than the other.

H is a yoke extending over the wheel G, and receiving it with its hub G′, as shown.

I is a bolt supported at each end in the yoke H, and forming a suitable bearing for the wheel.

K is a light roller of small diameter and considerable length. It is mounted on a bolt, J, firmly fixed in the yoke H in the position represented.

L is a clamp fixed on the lower portion of the yoke H, which, by means of a suitable shoe, *l*, and screw *l′*, can take hold or let go of the operating-rope M, at the will of the operator. This clamp L is riveted or otherwise firmly secured to the yoke H independent of the screw *l′*. A hinged joint, *h*, connects the yoke H to a hook, N.

P is a bucket tilting on trunnions *p*, which engage in eyes in a sufficiently-stout bail, Q, which is supported by the hook N. Any suitable locking means are provided for holding the bucket in the upright position in the bail

and allowing it to be emptied by tilting, when required.

T is a tilting platform supported on trunnions *t*. There are one or more of these at the loading-station.

To attach a bucket it is placed on the tilting platform T, and supported upright by the attendant with its bail, Q, held up. The first hook N which comes along engages the bail, and as it moves away the platform T is allowed to tilt, and the bucket is thus liberated, its weight is thrown upon the hook, and the steady travel along the line is commenced.

In the operation of the railway the full buckets are carried in one direction on the rail on one side of the railway and returned on the rail on the other side, suitable provisions being made at each end by a curved rail or otherwise for traversing the buckets across, and by a large horizontal wheel or otherwise for properly guiding and supporting the strain of the operating-rope M and giving it the necessary slow but strong motion. Under ordinary conditions the weight of the parts holds the wheel G firmly down upon the rail D D′. This is the case in traversing level portions of the track, and especially over the summits of elevations; but in traversing a depression the considerable strain on the operating-rope M exerts a lifting force on the yoke H and its attachments which, when a bucket is left unfilled, is liable to lift it from the track. Under these conditions the roller K becomes important by engaging under the stringers C and arms B, which, having their under faces flush with each other, form a sufficiently continuous track, along which the roller K traverses, being pressed upward by the strain, and turning rapidly on its pivot-bolt J until the depression is passed, when, by the sinking of the rope H and its attachments a little, the roller K goes out of contact and remains idle again for a long period until another considerable depression is reached, when the operation is repeated. The flat irons B, holding the rail D D′ D^2, with the stringer C out beyond the ends of the cross-pieces A, being recessed sufficiently into the bottom of the stringers, support the stringer and its connections efficiently.

It is important to have as few of the posts A as will suffice to reliably support the structure and hold the track in good condition. To this end the stringers C must be long, and it is important to stiffen and support them. The deep rail D D′ D^2, with its lower flange engaged in the groove and confined by frequent bolts *f*, performs this function.

The yoke H forms duplicate bearings for the bolt I, which is the axis of the wheel G, and by reason of the hub G′ being longer on the side nearest the short arm of said yoke the strain of the load is thrown equally on the pivot, the leverage decreasing in the direction of the short arm.

The compound framing of wood and iron shown in Fig. 8 is important only in situations where timber is scarce. The upright is a tube, W, efficiently protected by preservative coatings. Eyes *w*′ are attached by being forged or otherwise produced on thimbles *w* of sufficiently larger diameter to receive the main tube W within it. It is moved to the place desired and welded. The diagonal braces W^3 are riveted or otherwise strongly secured to the eyes *w*′ on the main tube W, and to angle-iron cross-pieces W′ of sufficient section to afford the requisite strength. The stringers C are of wood, equipped in all respects as before described, and supported on flat irons B. These latter are riveted or bolted to the cross-pieces W′.

Modifications may be made in the forms and proportions of the details.

I can increase the depth of the rail D D′ D^2, so as to make its lower edge come at the base of the stringers C; but I esteem the depth shown to be generally preferable.

Parts of the invention can be used without the whole.

I can vary the form of the section of the stringers C.

I do not confine the invention to the use of an endless rope or to any particular motive power for operating. It is well adapted for what are known as "gravity roads," where the line is inclined uniformly or otherwise from one end to the other and the weight of a descending bucket on one side loaded with coal, ore, or other material hauls up an empty bucket on the opposite track. In such case the operating-rope may be what is termed "endless;" or there may be two ropes wound in opposite directions on a suitable drum, and each wound up at one end and unwound at the other simultaneously.

I claim as my invention—

1. In an elevated railway or carrying system, the flat arm B, in combination with the post A, cross-piece A′, and a rail and supporting-stringer held thereby, the said arm B extending over beyond the end of said piece A′, as and for the purposes set forth.

2. The combination, with the flat arm B, the stringer and rail, of the roller K, supported on bolt J from the yoke H, the said yoke and bolt, the roller G, and provisions, as set forth, for carrying the bucket, as set forth.

3. In an elevated railway or carrying system, the flanged plate E E′, stringers C, double-headed rail D D′ D^2, and connecting-bolts *e*, arranged, as shown, so as to serve as herein specified.

4. In an elevated carrying system, the tilting platform T, in combination with the hooks N and supporting and impelling means therefor adapted to support and deliver the buckets P, substantially as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 19th day of December, 1883, in the presence of two subscribing witnesses.

Witnesses: A. J. B. BERGER.

M. F. BOYLE,

CHARLES R. SEARLE.