

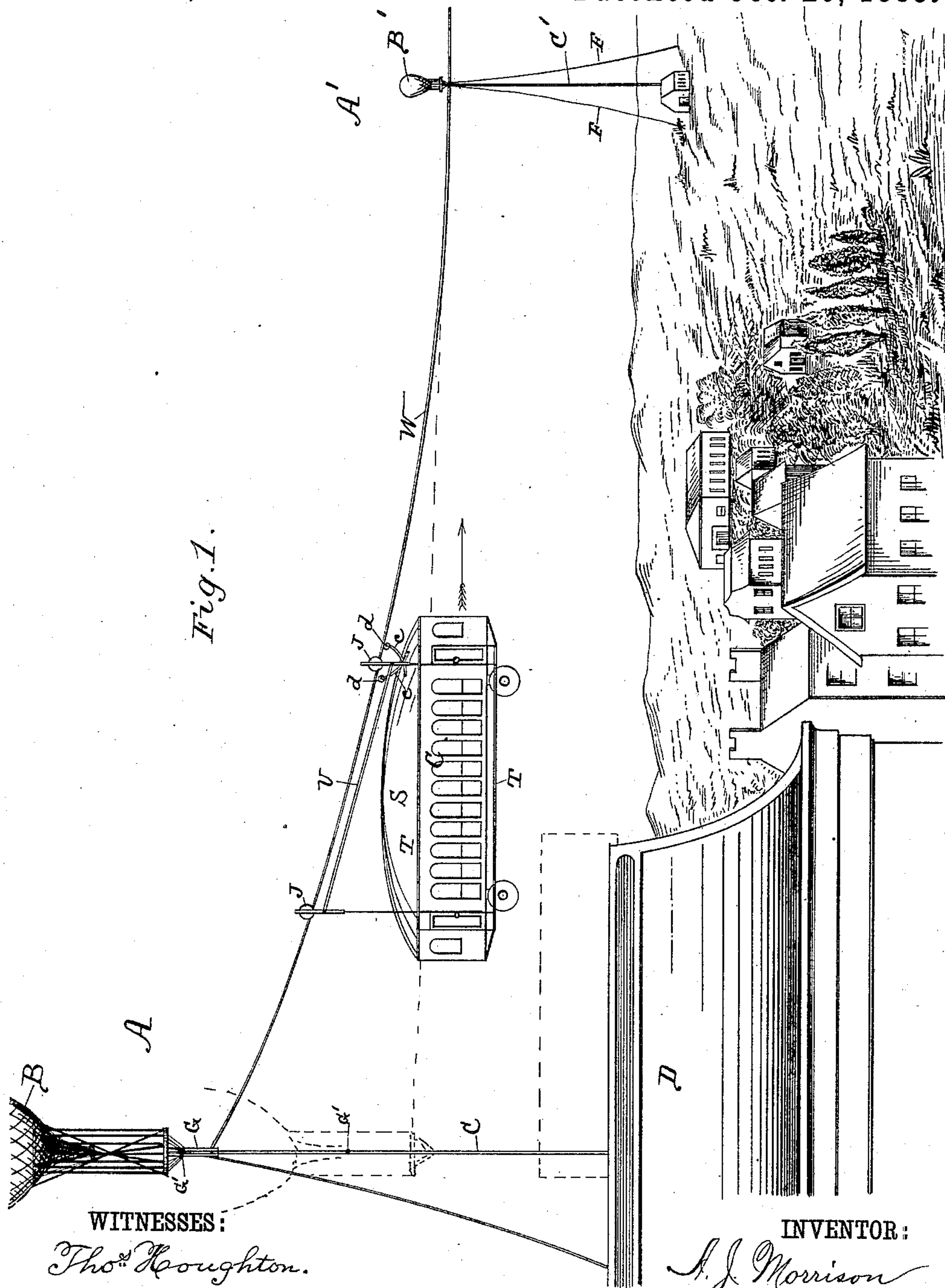
(No Model.)

2 Sheets—Sheet 1.

A. J. MORRISON.
AERIAL RAILWAY AND CAR.

No. 328,899.

Patented Oct. 20, 1885.



WITNESSES:

Thos. Houghton.

Edw. W. Byrnes

INVENTOR:

A. J. Morrison

BY

Munn & Co.

ATTORNEYS.

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Fig. 2.

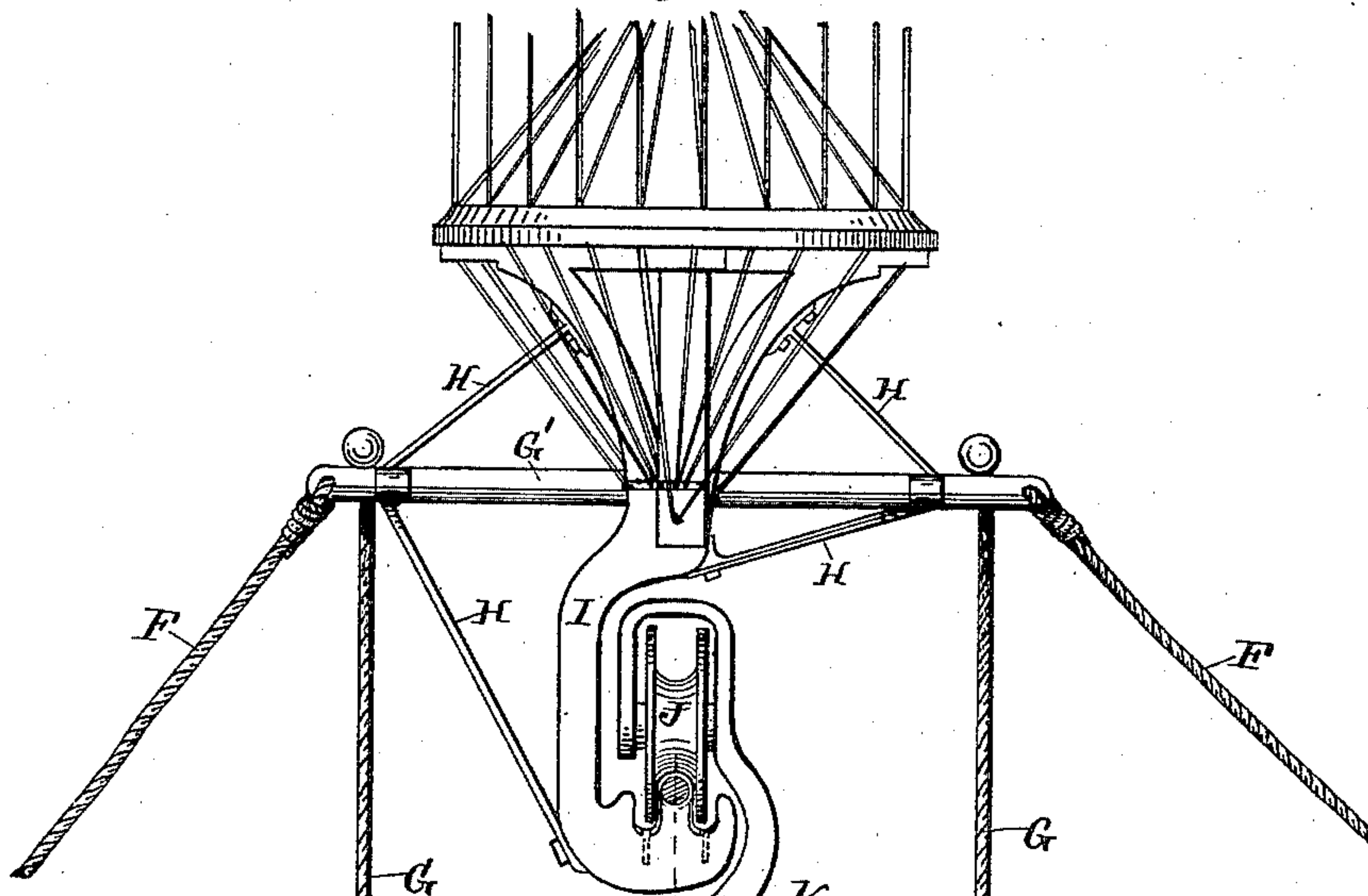


Fig. 3.

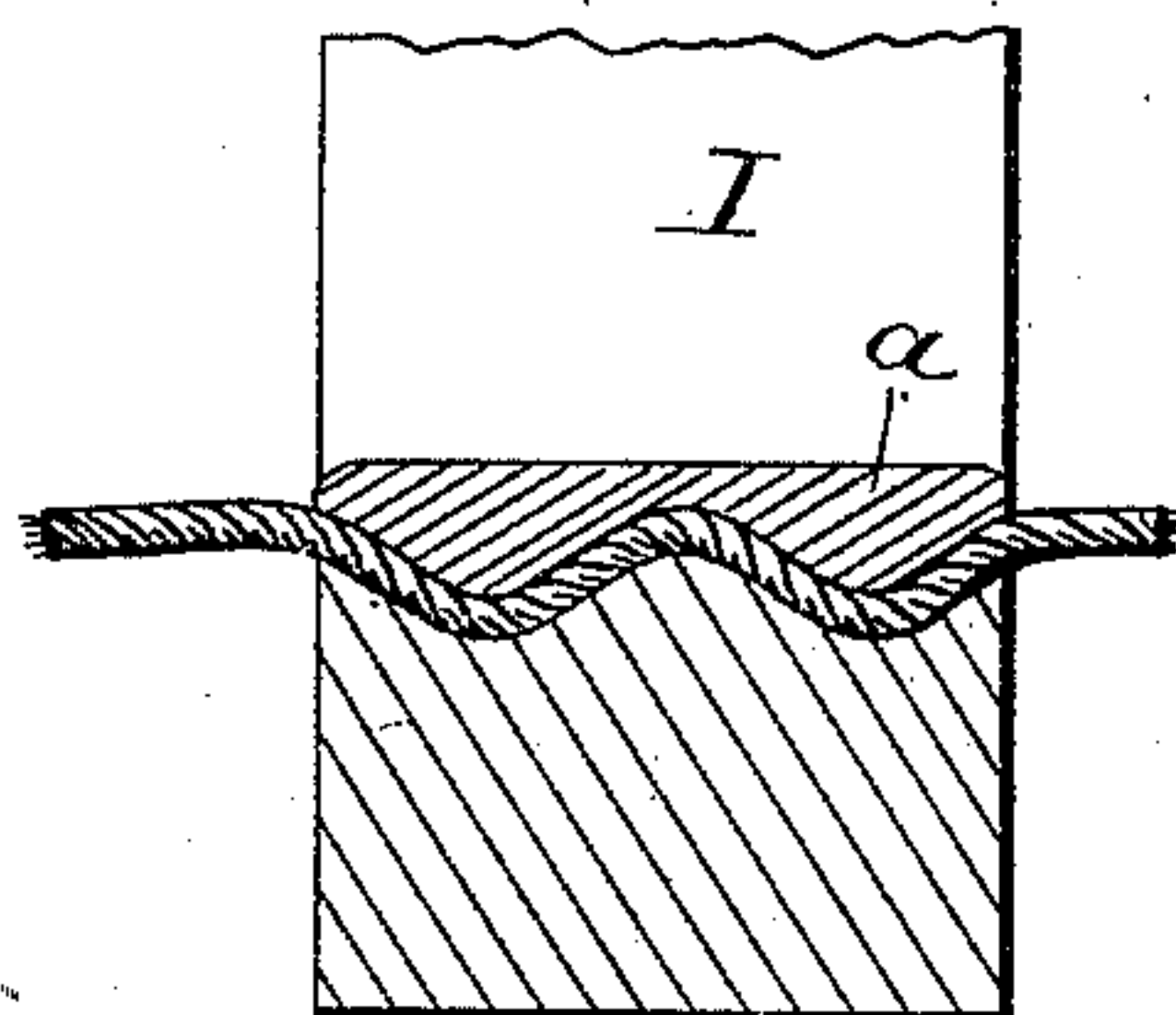
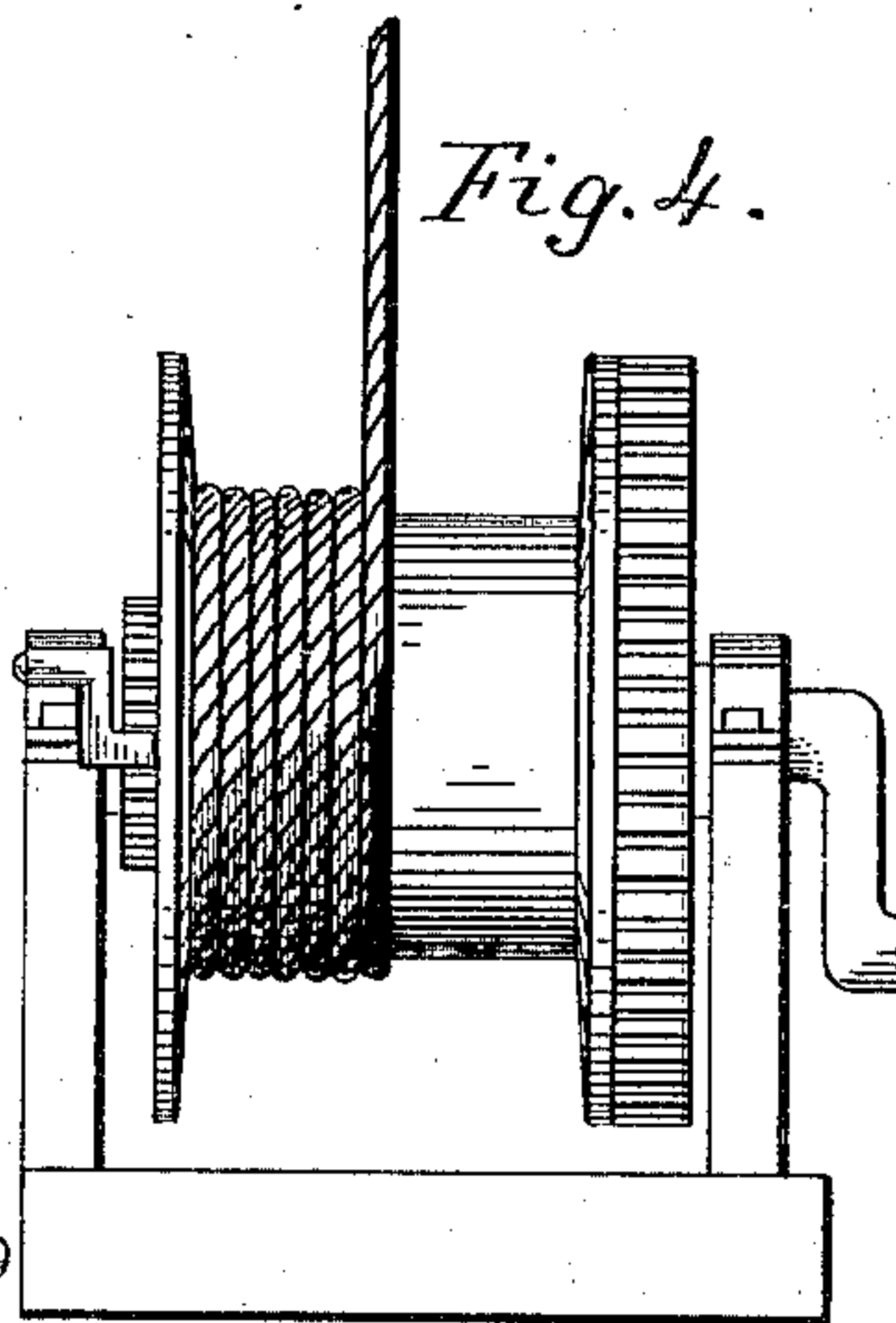


Fig. 4.



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UNITED STATES PATENT OFFICE.

ANDREW J. MORRISON, OF BUFFALO, NEW YORK.

AERIAL RAILWAY AND CAR.

SPECIFICATION forming part of Letters Patent No. 328,899, dated October 20, 1885.

Application filed February 13, 1885. Serial No. 155,856. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. MORRISON, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Aerial Railways and Cars, of which the following is a description.

Figure 1 is a perspective view of my invention. Fig. 2 is an enlarged sectional view through one of the stations, taken transversely to the cable. Fig. 3 is a sectional detail of the hanger for supporting the cable, and Fig. 4 is a detail of the winding-drum for the anchor-rope.

My invention relates to means of transportation; and it consists in an aerial railway constructed of a wire cable supported at intervals by balloons anchored to the earth, upon which cable is suspended a car, which is made to travel on the cable by its own gravity, for which purpose the balloons are connected by their anchor-ropes with winding apparatus at each station, by which said balloons may be raised or lowered to give to the cable the proper inclination to cause the car to travel from one station to the next.

The invention also consists in certain details of construction and arrangement for adapting this system of transportation to successful use, as will be hereinafter more fully described.

In the drawings, A represents a terminal and A' an intermediate station of my improved aerial railway, and W is the wire cable, which is sustained in mid-air by the balloons B B', which are anchored to the earth by ropes C C', connected at their lower ends to winding-drums (see Fig. 4) at the several stations, by which the balloons can be raised or lowered.

C is the car, which is suspended upon the wire cable W, and which is adapted to travel on the wire cable from gravity by giving an elevation to the wire cable behind the car successively at each station, by paying out the anchor-rope and raising the balloon next in rear.

At the terminal and intermediate landing-stations a high building, D, with proper landing-surface, is adapted to receive the car, while at the intermediate station, as at A', which is simply employed to sustain the cable and work the balloon, no depot or landing is required. When the car C is loaded with passengers or

freight, it rests upon the top of the landing-station, as shown in dotted lines on the left of Fig. 1, and when it is ready to be dispatched the balloon at this station is allowed to rise by unwinding its anchor-rope from the windlass below, causing the car and balloon to rise from the position shown in dotted lines on the left of Fig. 1 to the position shown in full lines, which causes the cable W to be thrown into an inclined position, which makes the car to travel from gravity to the next station. As soon as the car passes the balloon at this next station, the anchor-rope is unwound and this balloon allowed to ascend, so as to throw the next section of cable into an inclined position, and thus continue the passage of the car from gravity.

To prevent the balloons from swaying to and fro from the winds, guy-ropes F F are attached to the balloon and anchored to the earth on each side of the winding-stations, which guy-ropes should pass around pulleys, and also turn and be wound and unwound upon the drums with the anchor-rope.

For connecting the anchor-rope C to the balloon a trapeze-shaped sling, G G', Fig. 2, is employed, in order to let the car pass under the balloon without interference with its connections. The upper bar, G', of this trapeze forms an attachment for the guy-ropes F F, and also for the balloon, which is fastened by braces H to the top bar of the trapeze, and from which a hanger, I, sustains the cable. For connecting this hanger to the cable, so that it will not slip thereon, a waved bearing is formed for the cable on the hanger I, (see Fig. 3,) and the cable is clamped in this waved bearing by a top plate, a, which is screwed or bolted down, forming at this point a level continuation of the track upon which the flanged supporting-pulleys J J of the car travels. These supporting-pulleys J are sustained in brackets K K, which are attached to the car in a peculiar manner to allow the car to maintain a true horizontal position when supported upon the inclined cable. For this purpose the two brackets K at opposite ends of the car are similarly equipped, and it will therefore only be necessary to describe one. From the arms of this bracket two ropes, L L', pass through the top of the car, and are wound upon the separate spools of a windlass, M. One of these ropes, L, ter-

minates at its spool on the windlass; but the other, L', is wound once around its spool, and then descends through the bottom of the car and is wound upon a spool, N, on a short shaft, O, which shaft is connected by a bevel-gear, P, with a vertical shaft and hand-wheel, Q, in the car, and is also provided with a brake, R, operated by a similar shaft and hand-wheel, Q', which shafts, as a matter of precaution, are further provided with ratchet-wheels b, co-operating with pawls. By turning the hand-wheel Q the rope L' is wound upon the spool N, and the upper windlass, M, being turned thereby raises or lowers that end of the car relatively to the bracket.

To render the car as light as possible, a gas-compartment, S, is formed on the top thereof, which, when filled with gas, overcomes by its buoyancy a part of the gravity of the car.

Upon the sides of the car, near the top and bottom, are guard or fender rails T, which prevent any catching of the car against the side ropes of the suspending trapeze. The car is also furnished with wheels in order that it may smoothly move off from and onto its landing without gripping or catching.

To hold the two suspending brackets of the car a proper distance apart, a connecting-bar, U, is attached to each.

To regulate the speed of travel of the car, a brake composed of two pivoted levers, c c, is employed, which levers carry at their upper ends pulleys d d, that bind against the lower part of the cable and slightly curve it when pressure is applied, thus producing friction that retards, or, if necessary, entirely stops the car. These brake levers are worked from within the car by suitable ropes.

Having thus described my invention, what I claim as new is—

1. An aerial railway consisting of a continuous cable suspended at intervals from balloons anchored to the earth, as and for the purpose described.

2. The combination, with a cable, of a series of balloons for suspending it in mid-air, anchor-ropes for holding the balloon captive, and means for winding and unwinding the

anchor-ropes to give an inclination to the cable, substantially as shown and described. 50

3. The combination, with a cable, of a series of balloons suspending it, a set of anchor-ropes with means for winding and unwinding them, and a car provided with suspending pulleys supported upon the cable, whereby the sections of the cable may be successively thrown to an incline, and the car caused to travel from station to station by its own gravity, as described. 55

4. The combination, with the adjustable air-cable, of the car and supporting-pulleys and adjustable ropes for connecting the car to the cable and maintaining the horizontal position of the car irrespective of the inclination of the cable, as described. 60

5. The combination, with the balloon and its hanger, having a waved bearing, of the cable and the correspondingly-waved clamp for attaching the balloon to the cable without slipping, and forming a continuous track, as described. 65

6. The combination, with a cable, of a car suspended thereon by supporting-pulleys and having a gas-chamber in its top to reduce its weight, as described. 70

7. The combination, with the cable and the car, of the crossed brake-levers c c, having pulleys d d, arranged on opposite sides of one of the supporting-pulleys and bearing against the bottom side of the cable, as described. 75

8. The trapeze, combined with the balloon, its anchor-rope, and the cable passing through the trapeze, as and for the purpose described. 80

9. The combination, with the balloon, its anchor-rope, and winding-drum, of the guy-ropes having an adjustment commensurate with the adjustment of the anchor-rope, as described. 85

The above specification of my invention signed by me in the presence of two subscribing witnesses. 90

ANDREW J. MORRISON.

Witnesses:

EDW. W. BYRN,
 SOLON C. KEMON.