G. SAUVOLA.

ELEVATED RAILWAY.

APPLICATION FILED MAR. 25, 1913.

1,155,760.

Patented Oct. 5, 1915.

2 SHEETS—SHEET 1.

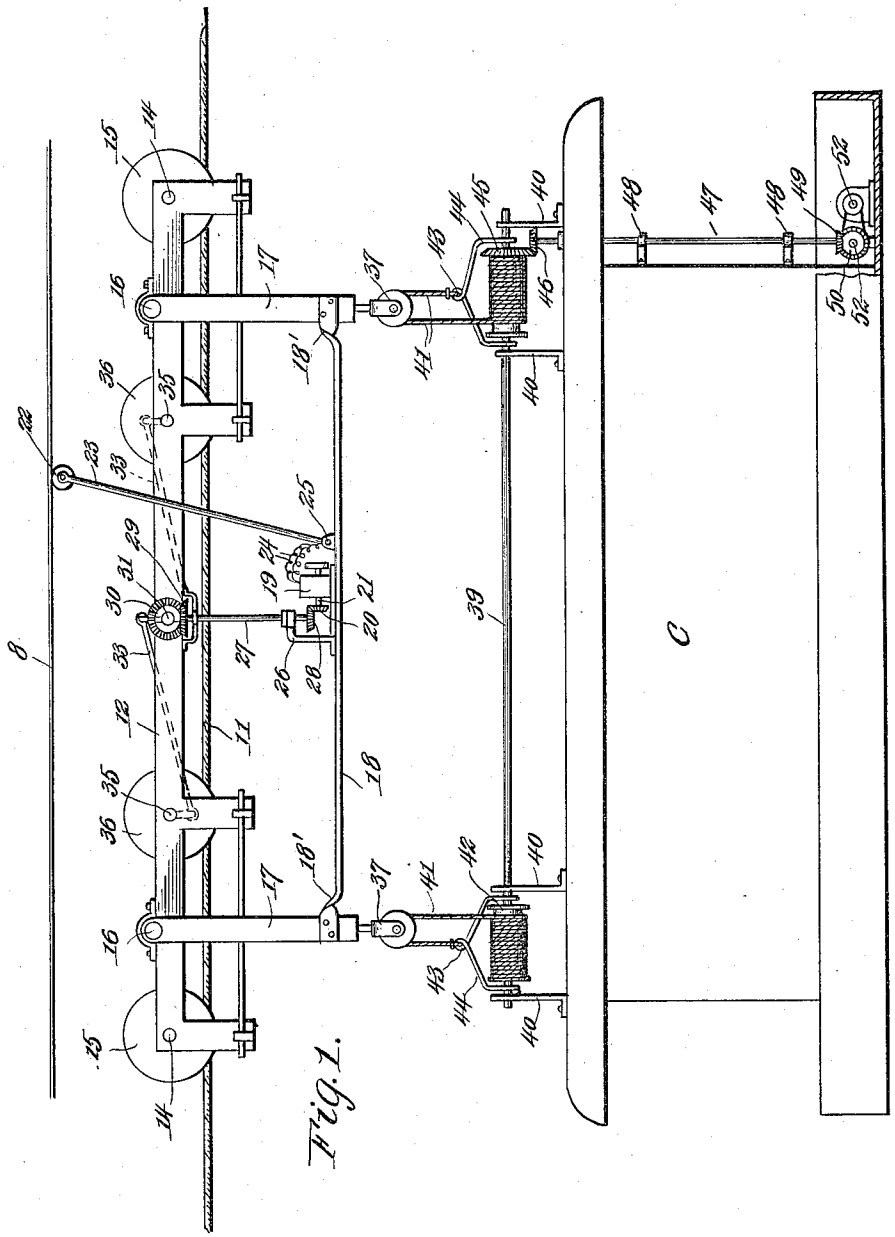


Fig. 1.

WITNESSES

G. M. Spring.

Wm. E. Walk Jr.

INVENTOR

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by Richard Owen

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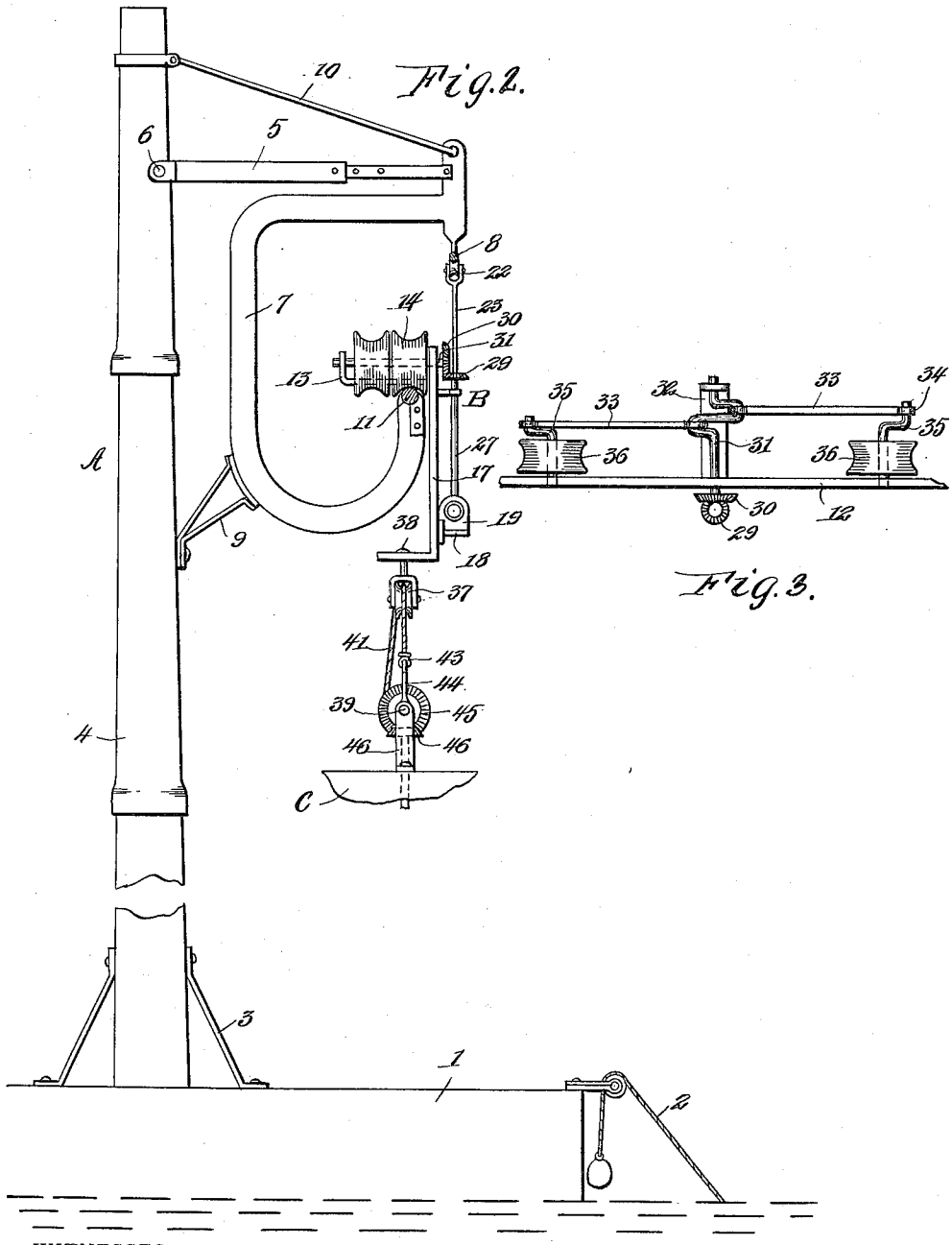


Fig. 2.

Fig. 3.

WITNESSES

G. M. Spring.

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UNITED STATES PATENT OFFICE.

GUSTAF SAUVOLA, OF ASTORIA, OREGON.

ELEVATED RAILWAY.

1,155,760. Specification of Letters Patent. Patented Oct. 5, 1915.

Application filed March 25, 1913. Serial No. 756,756.

To all whom it may concern:

Be it known that I, GUSTAF SAUVOLA, a citizen of the United States, residing at Astoria, in the county of Clatsop and State of Oregon, have invented certain new and useful Improvements in Elevated Railways, of which the following is a specification.

This invention relates to elevated electric railways and it has primarily for its object, the provision of an improved elevated electric railway system wherein especially devised means are employed for properly supporting or suspending a suitable car or conveyer from an overhead cable or wire.

A further object of the invention contemplates the provision of novel and peculiar hoisting mechanism, arranged upon the elevated car, whereby the entire car may be raised or lowered as desired, for receiving and discharging passengers or freight therefrom.

A still further object of the invention resides in the provision of electrically operated driving mechanism, supported upon the truck or carriage, and connected to the driving wheels of the said truck, thereby imparting motion to the said wheels for driving the car or conveyer either forward or backward over the line.

The invention resides further in the provision of suitable support means for elevating the cable or rail from which the car is suspended, and for elevating a trolley wire from which power is derived for driving the car, the said support means being arranged in spaced relation throughout the entire length of the railway line or system.

The above and additional objects are accomplished by such means as are illustrated in their preferred embodiment in the accompanying drawings, described in the following specification and then more particularly pointed out in the claims which are appended hereto.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views and in which;

Figure 1, is a side elevation of an elevated railway car constructed in accordance with my invention, Fig. 2, is an end view partly broken away illustrating the support means, and the manner in which the car or conveyer is suspended therefrom, and Fig. 3, is a detail top plan view of the driving shaft and its accessories.

Before proceeding with the description of the drawings, I desire to call particular attention to the fact that while I have evolved my invention with particular reference to its application in connection with elevated railways arranged upon floating scows for over water travel, the same may be readily utilized for various other purposes susceptible of its application.

Referring now to the drawings wherein is illustrated the preferred form of my invention, the numeral 1 designates a scow upon which the support means, designated in its entirety by the letter A, is arranged. The said scow may be anchored stationary by any suitable means such as is shown at 2 and the support means secured to the deck of the scow by means of a plurality of brace bars 3 secured thereto. The said support means preferably comprises a post or upright 4 made in sections, as is clearly shown in Fig. 2 of the drawings, the said post adapted to support a laterally extending arm 5 secured thereto as at 6 to the upper end thereof. A bracket 7 is mainly supported by the laterally extending arm 5 and has secured thereto, a trolley wire 8, the purpose of which will subsequently appear. Any suitable braces such as are shown at 9 and 10 may be employed for the purpose of additionally supporting the bracket 7 in rigid relation with the upright post 4, the said bracket being shaped in such a novel and peculiar manner as to support upon one extremity thereof, the cable 11, upon which the truck, designated by the character B, is supported. In shape, the bracket 7 is formed somewhat after the manner of a C, the upper extremity or terminus having the trolley wire 8 secured thereto while the lower extremity is adapted to support the cable 11 above referred to, this construction leaving sufficient space between the trolley 8 and the cable 11 to allow the wheels of the truck B to ride freely thereupon.

Having described in detail, the construction of the truck supporting means, the detail construction of the truck itself will now be described. A suitable truck frame 12 is provided, having a plurality of arms 13 projecting therefrom upon the inner face thereof, the said arms 13 and the frame 12 being so arranged as to properly support a plu-

rality of laterally extending wheel shafts 14 upon which certain of the wheels 15 of the truck are mounted. Near each end of the truck frame 12 is secured as at 16 a depending L-shaped bracket 17 from which the car or conveyer C is suspended. The lower extremities of the said bracket 17 are connected through the medium of a cross beam 18 twisted as at 19 so as to present a flat surface directly beneath the trolley wire 8. An electric motor 19 of any well known type, is secured to the beam 18 for operating or rotating a bevel gear 20 secured to the main shaft 21 of the said motor, the latter being energized by the electric current derived through the medium of a trolley wheel 22 supported by a trolley pole 23 and connected to the motor 19 by means of wires 24 leading from a point 25 where the said pole is pivotally mounted in the beam 18 of the truck. By this arrangement it will be seen that sufficient power is derived from the trolley wire 8 to forward or back the truck as desired. A suitable bracket 26 is mounted upon the upper face of the cross beam 18 within which a vertically extending shaft 27 is journaled, the said shaft terminating at its lower extremities to a beveled gear 28 adapted to mesh with the bevel gear 20 of the motor. The upper extremity of the said shaft 27 is likewise provided with a bevel gear 29 which meshes with a similar gear 30 keyed or otherwise secured upon the extremity of a double crank shaft 31 journaled within the truck frame 12 and a suitable bracket 32 projecting therefrom. Connecting rods 33 are loosely mounted, one upon each offset portion of the double crank shaft 31, the said rods projecting oppositely from the said shaft and terminating in eyes 34 within which crank shafts 35 are loosely mounted, the said shafts 35 having keyed or otherwise secured thereto, the driving wheels 36 of the truck. The said driving wheels 36 and the wheels 15 above referred to are so arranged with respect to the frame 12 as to properly support the car C depending therefrom, the driving wheels 36 being disposed intermediate the wheels 15 of the said truck. Any suitable means may be employed for reversing the motor 19, thereby reversing the direction of travel of the truck over its supporting cable.

Passing on to the detail description of the hoisting mechanism employed in connection with my invention, the numeral 37 designates a pair of suitable pulleys secured as at 38 to the lower extremities of the L-shaped brackets 17. A shaft 39 is mounted upon the top of the car C through the medium of a plurality of suitable supports 40, the said shaft extending parallel with the cross beam 18 of the truck. Ropes 41 (or any suitable elements) are employed for suspending the car C from the pulleys 37, the said ropes being wound upon drums 42 rigidly secured, one near each extremity of the shaft 39, the said ropes extending upwardly from the drums, over the pulleys and depending downwardly to a point 43 where they are secured to yokes 44 adapted to straddle the said drum and for effecting a connection with the said shaft 19. One of the drums 42 is provided with a beveled gear 45, the said gear adapted to mesh with a similar gear 46 fixedly secured upon the upper extremity of the vertically extending shaft 47 journaled within brackets 48 secured to one end of the car or conveyer C. The lower extremity of the said shaft 47 is also provided with a beveled gear 49 which in turn meshes with a similar gear 50 secured to a shaft 51 rotated through the medium of a suitable motor 52 arranged upon the floor of the said car C. By operating the motor 52, movement is imparted to the shaft 47 through the medium of the bevel gears 50 and 51 for operating the gears 45 and 46, thereby rotating the drums 42 of the shaft 39. This operation, according to the direction of rotation of the said shaft 39, will either elevate or lower the entire car body by reason of the ropes 41 being arranged over the pulleys 37 of the truck.

In practice, any number of support means may be employed throughout the railway line or system for supporting the wire 8 and the cable 11, the number being determined by the length of the line. The construction of a car as above described, will permit travel thereof at a high rate of speed and will allow the car body to be raised and lowered as occasion demands for receiving and discharging passengers. Railways of this kind may be usefully employed for various purposes. By arranging the posts A upon scows or floors as herein illustrated, it will be seen that passengers or freight may be conveyed over water as well as land, and that the raising and lowering of the car body will allow a free discharge of the car contents as desired.

It will be seen from the above, taken in connection with the accompanying drawings, that the driving power is imparted to the wheels 36 by reason of the double crank shaft 31 arranged upon the truck; that the raising and lowering of the car body is controlled from the interior of the car by the operation of the motor 52; and that the novel and peculiar construction of the bracket 7 of the support means will permit unobstructed passage of the truck over the cable, throughout the entire length of the line.

Any suitable brake mechanism may be employed in connection with the invention for regulating the speed of travel of the car from the interior thereof.

It will be understood that the above de-

scription and the accompanying drawings comprehend only the general and preferred embodiment of my invention and that various minor changes in the details of construction, proportion and arrangement of parts may be made within the scope of the appended claims, and without sacrificing any of the advantages of my invention.

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

1. In combination with an elevated railway, a supporting cable, a movable member thereupon, a car suspended from said movable member, an operating shaft mounted upon said car, means carried by said operating shaft, means for actuating said first-mentioned means and means connecting said first-mentioned means with said movable member for raising and lowering said car relative thereto.

2. In combination with an elevated railway, a supporting cable, a supporting track, a movable member thereupon, a car suspended from said movable member, an operating shaft mounted upon said car, means at the ends of said shaft, means carried by said car for actuating said first-mentioned means, and means connecting said first-mentioned means with said movable member for raising and lowering said car relative thereto.

3. In combination with an elevated railway, a car supporting cable, a trolley wire, a car suspended from the said cable, drums carried by the said car, means carried by the said car for rotating the said drums, a supporting truck for the car movable upon said cable, and a flexible element connecting the said drum with the said truck for raising and lowering the said car relative to the cable, as and for the purpose set forth.

4. In combination with an elevated railway, a supporting cable, a truck movable thereupon, a car suspended from the said truck, an operating shaft mounted upon the said car, drums carried by the said shaft, means carried by the said car for actuating the said drums, means connecting the said drums with the said trucks for raising and lowering the said car relative thereto, as and for the purpose set forth.

5. In combination with an elevated railway, a supporting cable, a truck frame, wheels carried by the said frame disposed for engagement with the said cable, a double crank shaft connected to certain of the said wheels for imparting motion thereto, means carried by the said truck for actuating the said shaft, and a car connected to the said truck adapted to be raised and lowered relative thereto, as and for the purpose set forth.

6. In combination with an elevated railway, a supporting cable, a truck frame, wheels carried by the said frame and disposed for engagement with the said cable, a crank shaft upon which certain of the said wheels are mounted for rotation, a double crank shaft connected to the first mentioned crank shaft for imparting motion to certain of the said wheels, means carried by the said truck for driving the said crank shaft, a car suspended from the said truck, and means including a pair of rotatable drums carried by the said car and connected to the said truck for raising and lowering the former relative thereto, as and for the purpose set forth.

7. An elevated railway system comprising cable supporting means including an upright post, an arm projecting laterally therefrom, a substantially C shaped bracket supported by the said arm, a cable supported by the said bracket, a conveyer car suspended from the said cable, means for driving the car along the cable, and hoisting mechanism arranged upon the conveyer for raising and lowering it at various points along the line.

8. An elevated railway system, comprising cable supporting means including an upright post, an arm projecting laterally from one side thereof, a substantially C shaped bracket supported by the said arm, the said cable being secured to the lower extremity of the said bracket, a truck frame supported by the said cable, a conveyer car suspended from the said truck, means supported by the said bracket, and engaging said trolley wire for driving the car along the cable, and hoisting means arranged upon the conveyer for raising and lowering it at various points along the line.

9. In combination with an elevated railway, a supporting cable, a trolley wire, a truck frame supported by the said cable, wheels supported by the said frame adapted to engage the said cable, a double crank shaft journaled within said frame, the said shaft being connected to certain of the wheels for driving the truck along the cable, and means carried by the said frame for driving the said crank shaft.

10. In combination with an elevated railway, a supporting cable, a truck frame supported by the said cable, wheels journaled within said frame adapted to engage the said cable, a double crank shaft supported by the frame, the said crank shaft being connected to certain of the wheels for rotating the wheels and driving the truck along the line, a motor supported by the truck, and means including a plurality of shafts and gears for connecting the motor to the said crank shaft, as and for the purpose set forth.

11. In combination with an elevated railway, a supporting cable, a truck frame supported thereby, wheels journaled within said frame adapted to engage the said cable, certain of the wheels being fixedly secured to a crank shaft journaled within said frame, a

double crank shaft journaled within said frame, means for connecting the said double crank shaft to the first mentioned crank shafts for driving certain of the wheels, a motor supported upon said frame, a vertically extending shaft journaled within said frame, for driving the double crank shaft according to the rotation of the motor shaft, and means for connecting the motor to an overhead trolley wire, as and for the purpose set forth.

12. In combination with an elevated railway, a supporting cable, a trolley wire disposed in spaced relation thereto, a truck frame, wheels carried by the said frame and disposed for engagement with the said cable, a double crank shaft carried by the said frame, means connecting the said double crank shaft to certain of the said wheels for driving the latter, means carried by the said frame for driving the said crank shaft, the said last mentioned means being in engagement with the said trolley wire, a car body, a shaft carried thereby, drums rotatable with said shaft, means connecting the said drums with the said truck for raising and lowering the car relative thereto, and means carried by the said car for actuating the said drums, as and for the purpose set forth.

13. In combination with an elevated railway, a supporting cable, a trolley wire disposed in parallel spaced relation thereto, a truck frame, wheels carried by the said frame disposed for engagement with the said cable, a crank shaft carried by the said frame upon which certain of the said wheels are mounted for rotation, a double crank shaft carried by said frame, means connecting the said double crank shaft with the said first mentioned crank shaft for driving the latter, and means connecting the said trolley wire with the said double crank shaft, the said means being carried by the said truck, for driving the said crank shaft to propel the truck along the cable, a car body suspended from the said truck, a shaft mounted for rotation upon the said car body, drums carried by the said shaft, means connecting the said drum with the truck for raising and lowering the car relative thereto, and means carried by the car for actuating the drum, as and for the purpose set forth.

14. In combination with an elevated railway, a supporting cable, a truck frame supported by said cable, pulleys depending from the lower extremity of said frame, a conveyer car suspended from said pulleys, a shaft journaled upon said car, drums fixedly secured to said shaft, ropes having one end secured to and wound upon said drums, the other ends of the said ropes adapted to pass over the pulleys where they are secured to the said shaft, a motor supported upon the said car and means including a plurality of shaft and gears for connecting the said motor to one of said drums for rotating the first mentioned shaft for raising and lowering the car at various points along the line.

15. In combination with an elevated railway, a supporting cable, a truck frame, wheels carried by said frame adapted to engage said cable, a double crank shaft journaled within said frame, means for connecting the said crank shaft to certain of the wheels for rotating the latter and driving the truck along the cable, and means including a motor carried by the frame for rotating the said crank shaft, of pulleys depending from the said frame, a conveyer car suspended from said pulleys, a shaft journaled upon said car, drums fixedly mounted upon said shaft, and means carried by the said car for operating the drums for raising and lowering the car at various points along the line of the cable.

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

GUSTAF SAUVOLA.

Witnesses:
BENJ. SAUVOLA,
J. O. ERICKSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."