

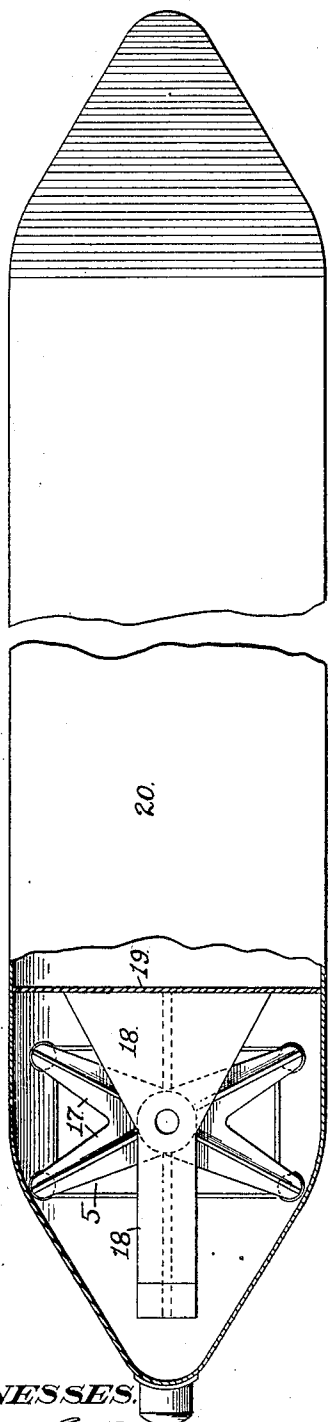
No. 891,882.

PATENTED JUNE 30, 1908.

W. D. VALENTINE.
MONORAILWAY SYSTEM.
APPLICATION FILED NOV. 14, 1907.

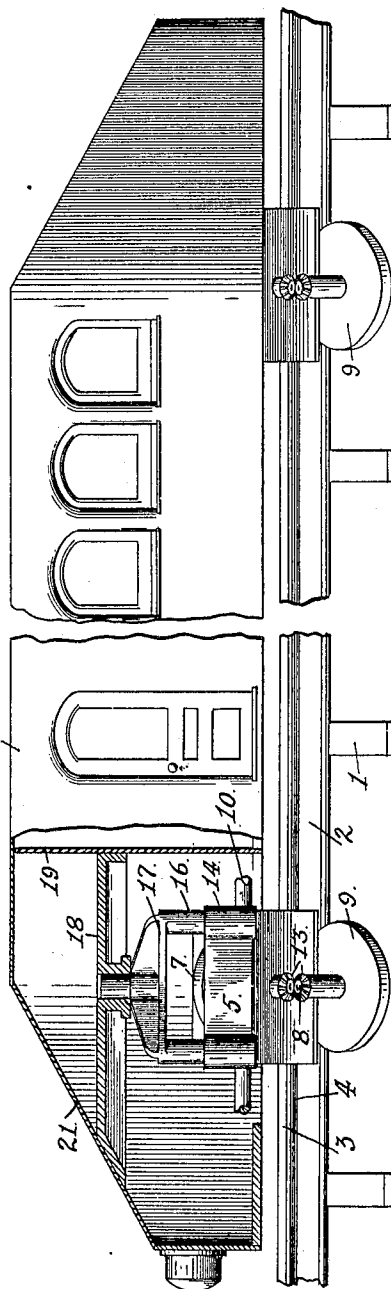
2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.
Arthur L. Lee
W. A. Coker

Fig. 2.



INVENTOR.

Walter D. Valentine
by *Wm. F. Booth*
his Attorney.

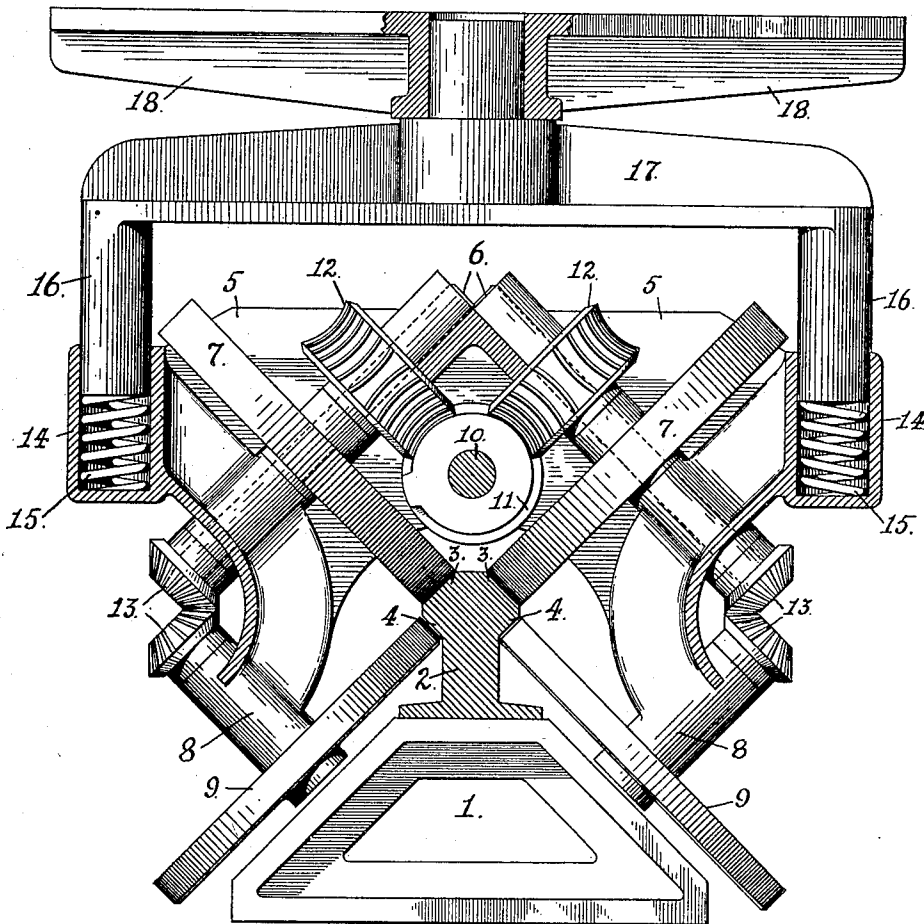
No. 891,882.

PATENTED JUNE 30, 1908.

W. D. VALENTINE.
MONORAILWAY SYSTEM.
APPLICATION FILED NOV. 14, 1907.

2 SHEETS—SHEET 2.

Fig. 3.



WITNESSES.

Arthur L. Lee.
W. D. Valentine

INVENTOR.

Walter D. Valentine
by H. F. Booth
his Attorney.

UNITED STATES PATENT OFFICE.

WALTER D. VALENTINE, OF ALTADENA, CALIFORNIA, ASSIGNOR TO NATIONAL RAPID TRANSIT COMPANY, OF SEATTLE, WASHINGTON, A CORPORATION OF WASHINGTON.

MONORAILWAY SYSTEM.

No. 891,882.

Specification of Letters Patent.

Patented June 30, 1908.

Application filed November 14, 1907. Serial No. 402,077.

To all whom it may concern:

Be it known that I, WALTER D. VALENTINE, a citizen of the United States, residing at Altadena, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Monorailway Systems, of which the following is a specification.

My invention relates to that class of railways which, from the employment of a single rail, are sometimes called monorailway systems.

In a railway using a single rail the advantages of increased speed and decreased cost of construction, maintenance and operation have hitherto been outweighed by problems of equilibrium and derailment.

It is the object of my invention to successfully meet and solve these problems, thereby securing the desired advantages of speed with safety, and economy.

To these ends my invention consists in the novel construction and arrangement of the car-trucks, its wheels, and the rail, as I shall hereinafter fully describe by reference to the accompanying drawings in which,

Figure 1 is a top plan, broken and in part sectioned horizontally, showing the truck in the car-body. Fig. 2 is a side elevation of the same, partly in section. Fig. 3 is a vertical cross section of the truck and rail, the wheels, axles and gears being in elevation.

1 represents any suitable form of substructure, elevated or otherwise, upon which is laid, in suitable manner, the single or monorail 2. This rail is made of proper strength, its construction, whether rolled as a single body or built up of suitable sections being immaterial to the present application; and I have, therefore, for the sake of illustration, shown it as a rolled integral rail. Its form, however, as far as regards its head is material, and, as will be seen clearly in Fig. 3, this head has a quadrilateral contour, so disposed as to present two anterior inclined treads 3, which converge upwardly, and two posterior inclined treads 4, which converge downwardly to meet the web of the rail.

5 is the wheel-frame of the car-truck. In this frame are mounted the axles 6 of the upper wheels 7, and the axles 8 of the lower wheels 9. The axles 6 are parallel to the anterior treads 3 of the rail 2, and the axles 8 are parallel to the posterior rail-treads 4. All the wheels have unflanged treads, and all

are of the same diameter. The wheels 7 are arranged to travel on the treads 3 and the wheels 9 are disposed to travel on the treads 4, but the relative positions of the wheels, in their grouping about the rail-treads, is such that in normal travel and equilibrium, the lower wheels 9 do not contact with, but revolve clear of the treads 4, as shown in Fig. 3, the weight of the car being then carried by the upper wheels 7 on the treads 3.

10 is the driving shaft receiving motion from any suitable source of power. Upon this shaft is a worm 11 which meshes with pinions 12 on the axles 6, whereby the wheels 7 are driven in unison and at the same speed. The axles 6 transmit motion to the axles 8 by means of the bevel gears 13, so that the lower wheels 9 are driven in unison with each other and with the upper wheels and at the same speed; all the gears being constructed and timed to these ends of unitary driving at equal speed.

In the corners of the wheel-frame 5 are seats 14 in which are springs 15. Upon these springs rest the pedestals 16 of the truck superstructure frame 17; and centrally pivoted on this frame is the bolster 18. This bolster, as shown in Fig. 1, has a widened inner end which is secured to a wall plate 19 in the car-body 20, the forward end of the bolster being secured to the front wall 21 of the car-body.

From the foregoing it will be seen that the wheels 7 and 9, grouped about the rail-head, as shown, form a stable support and lock to maintain the equilibrium of the car and to prevent derailment. As stated, the upper wheels 7 normally bear the weight of and drive the car, the lower wheels then revolving clear of their rail-treads. But when the upper wheels or either of them, from any cause, leave their rail treads, the lower ones or either of them at once contact with their treads, and as these lower wheels are positively driven, in unison with and at the same rate as the upper wheels, their contact with the rail is practically frictionless and without jar, and they at once take up, by traction, the function of driving, so that the car, no matter what may be its motions, is always under an equal and steady driving power.

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

1. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, and a truck-frame having inclined wheels grouped about and adapted to roll upon said treads. 70
2. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, and means for positively driving each of said wheels. 75
3. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, and means for positively driving all of said wheels in unison. 80
4. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, and means for positively driving said wheels in unison and at the same peripheral speed. 85
5. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, said wheels being of the same diameter, and means for positively driving all of said wheels in unison and at the same speed. 90
6. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, and a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, the lower wheels having a slight clearance from the posterior treads when the upper wheels roll upon their anterior treads, and vice versa. 95
7. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, the lower wheels having a slight clearance from the posterior treads when the upper wheels roll upon their anterior treads, and vice versa, and means for positively driving all of said wheels. 100
8. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having inclined wheels grouped about and adapted to roll upon said treads, said wheels being of the same diameter, and means for positively driving all of said wheels in unison and at the same speed. 105
9. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having mounted therein four inclined axles with wheels grouped about and adapted to roll upon said treads, a driving shaft, power transmitting connections therefrom to drive the axles of the upper wheels, and power transmitting connections from the axles of the upper wheels to drive the axles of the lower wheels. 110
10. In a monorailway system, the combination of a rail having a head formed with opposing upwardly converging anterior treads and opposing downwardly converging posterior treads, a truck-frame having mounted therein four inclined axles with wheels all of equal diameter, grouped about and adapted to roll upon said treads, a driving shaft, power transmitting connections therefrom to drive the axles of the upper wheels, and power transmitting connections from the axles of the upper wheels to drive the axles of the lower wheels, all of said wheels being driven at equal speed. 115
11. In a monorailway system and in combination with a rail having a head with inclined anterior and posterior treads and wheels grouped about and engaging said treads, a frame carrying said wheels and having springs seated in its corners, a superstructure frame seated on said springs, and a bolster plate pivoted on said superstructure frame. 120
12. In a monorailway system and in combination with a rail having a head with inclined anterior and posterior treads and wheels grouped about and engaging said treads, a frame carrying said wheels and having springs seated in its corners, a superstructure frame seated on said springs, a bolster plate pivoted on said superstructure frame, said bolster plate having a widened rear end, and a car-body having walls to which the ends of the bolster plate are secured. 125

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

WALTER D. VALENTINE.

Witnesses:

N. A. ACKER,
D. B. RICHARDS.