A. E. KINTNER.

TRACTION INCREASING DEVICE.

APPLICATION FILED MAR. 16, 1908.

938,490.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 1.

Fig. I.

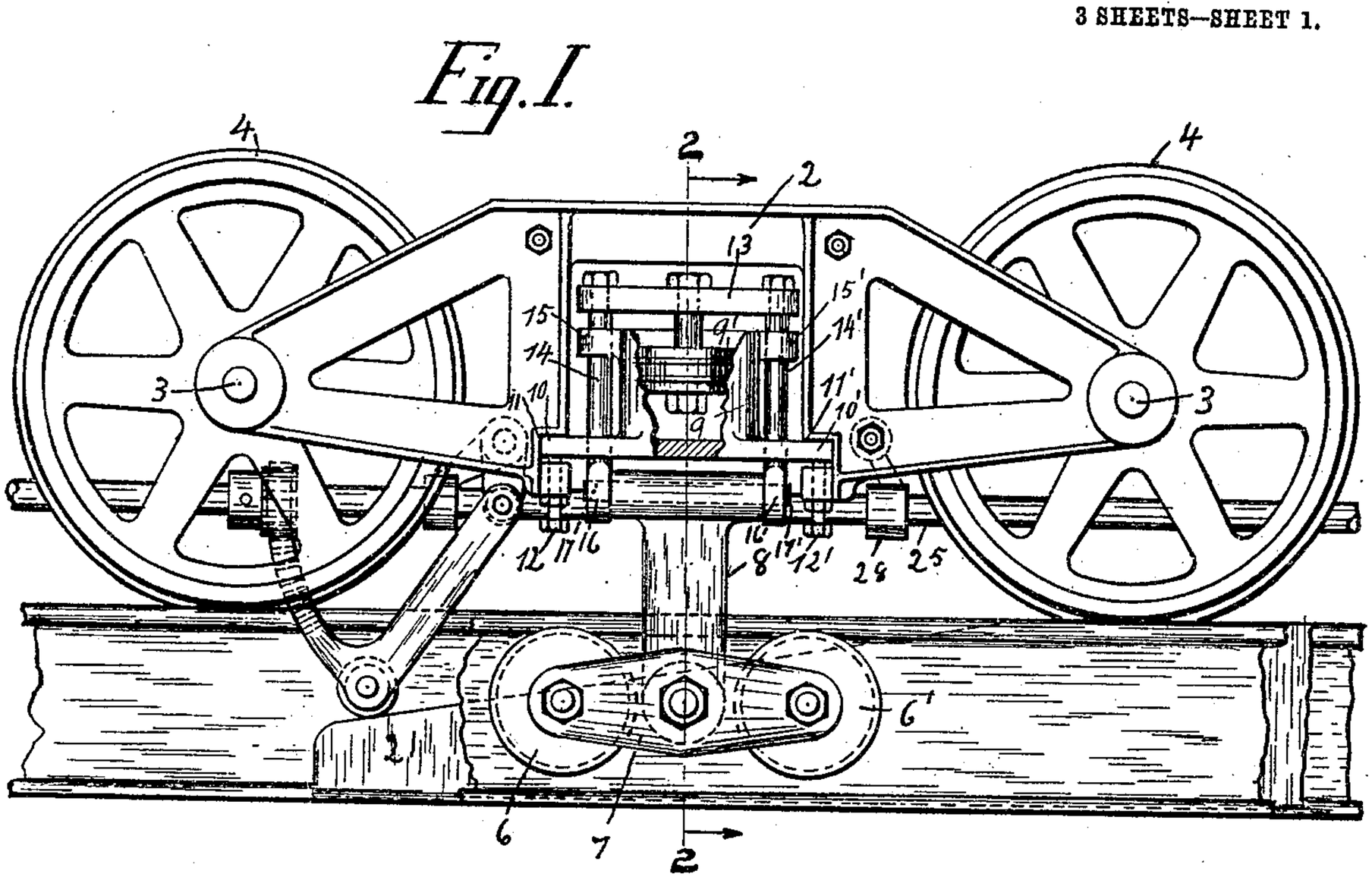
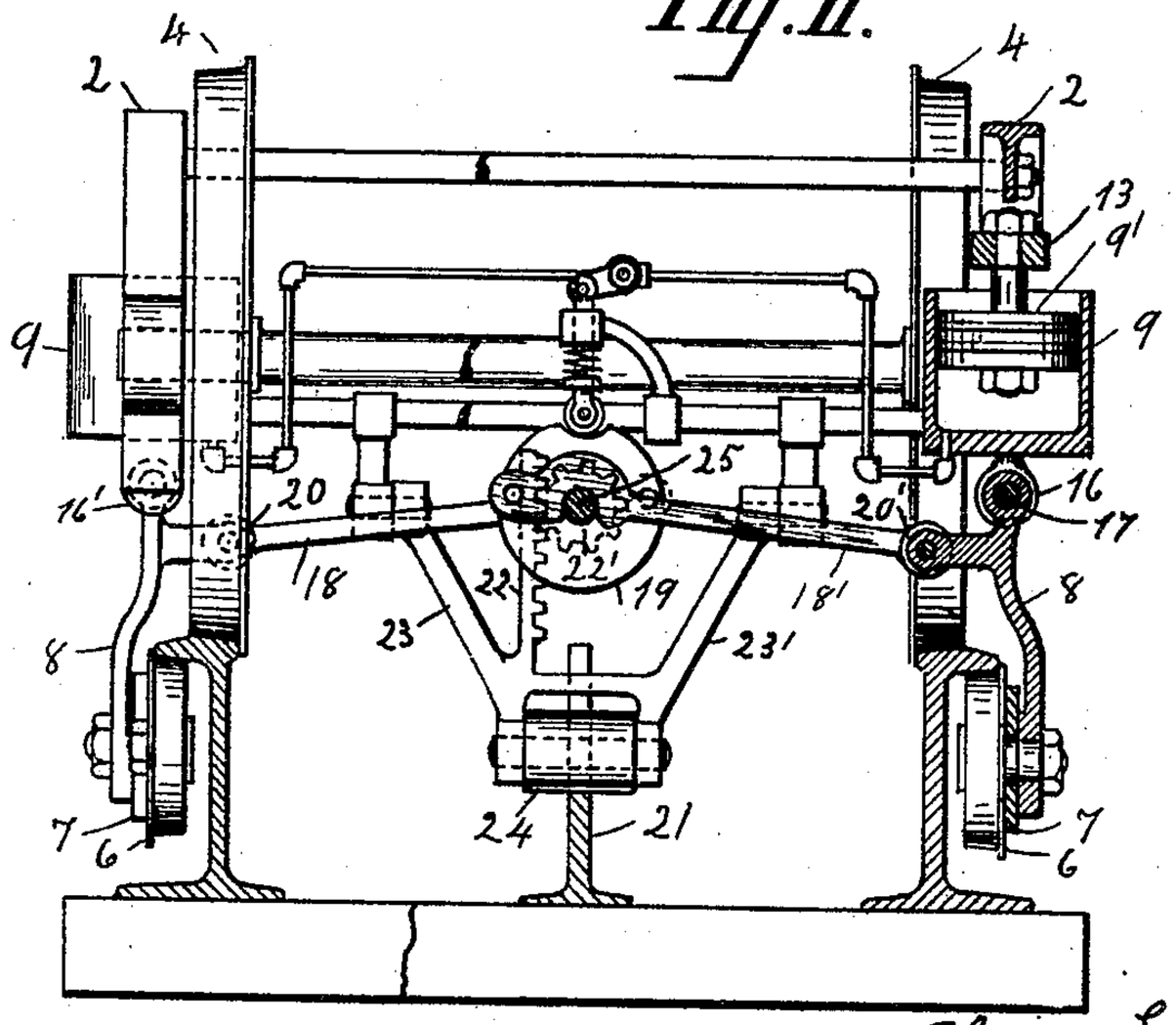


Fig. II.



Witnesses:

Edw. Lindmueller.

W. F. Donnelly

Alcuin E. Kintner
Inventor:

By W. E. Donnelly

His Attorney.

A. E. KINTNER.

TRACTION INCREASING DEVICE.

APPLICATION FILED MAR. 16, 1908.

938,490.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 2.

Fig. III

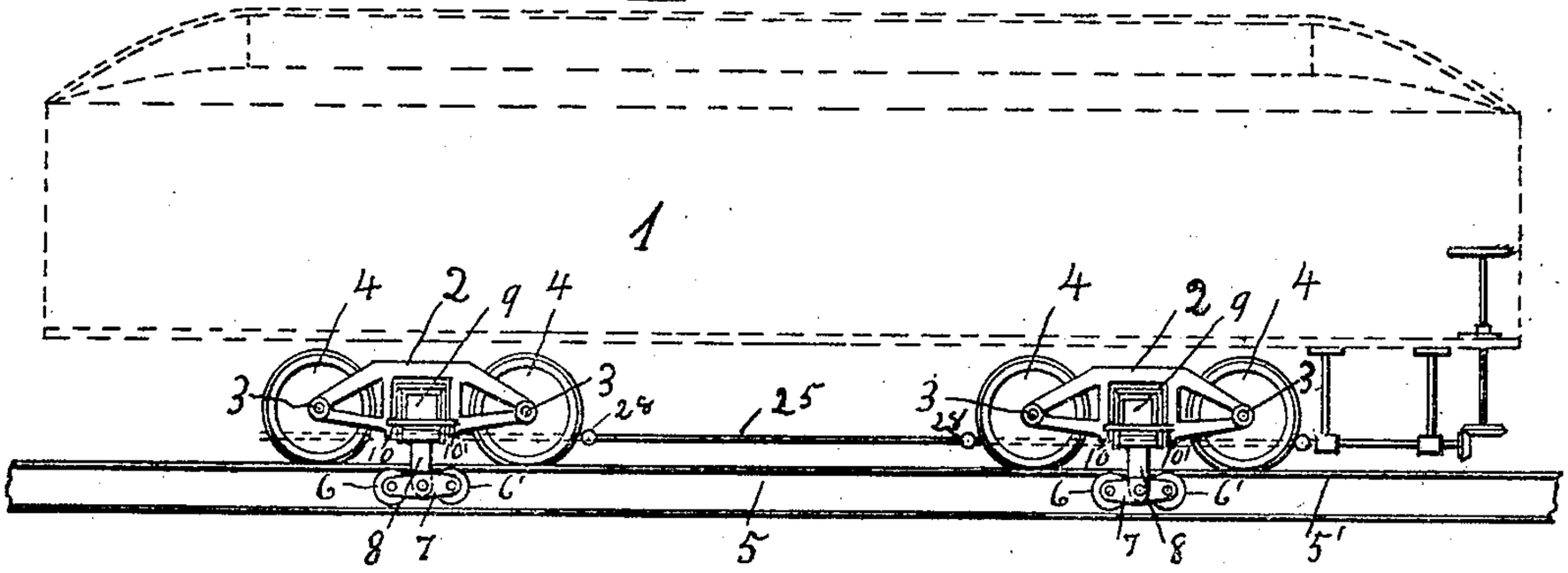


Fig. V.

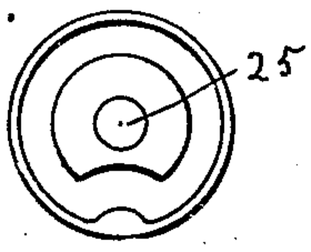


Fig. VI.

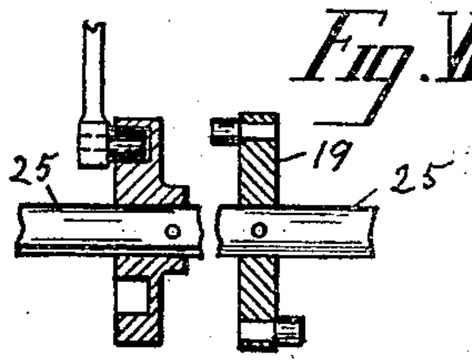
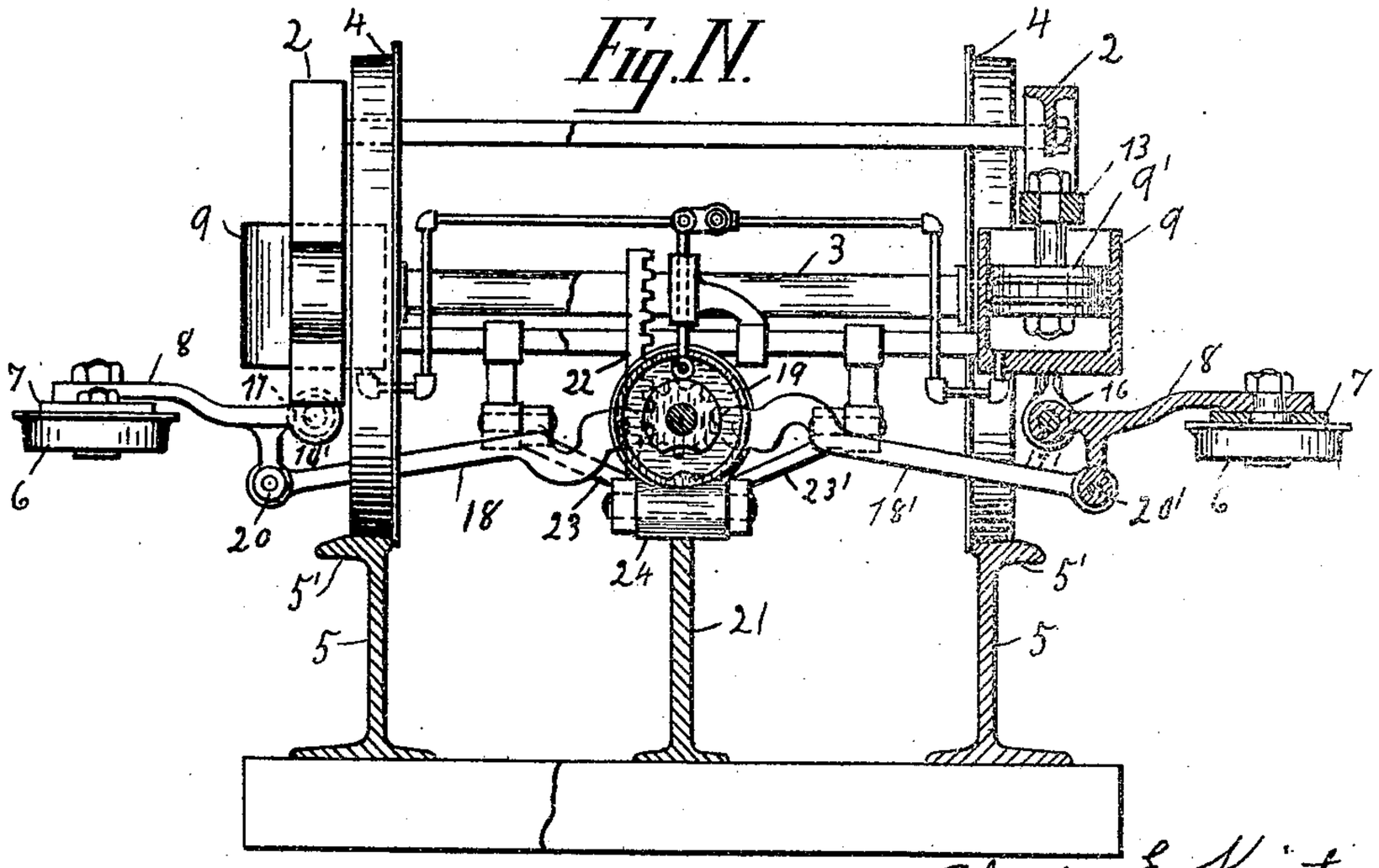


Fig. IV.



Witnesses:

Edw. Lindemueller.

W. F. Donnelly

Alcuin E. Kintner

Inventor:

By W. E. Donnelly

His Attorney.

A. E. KINTNER.

TRACTION INCREASING DEVICE.

APPLICATION FILED MAR. 16, 1908.

938,490.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 3.

Fig. VII

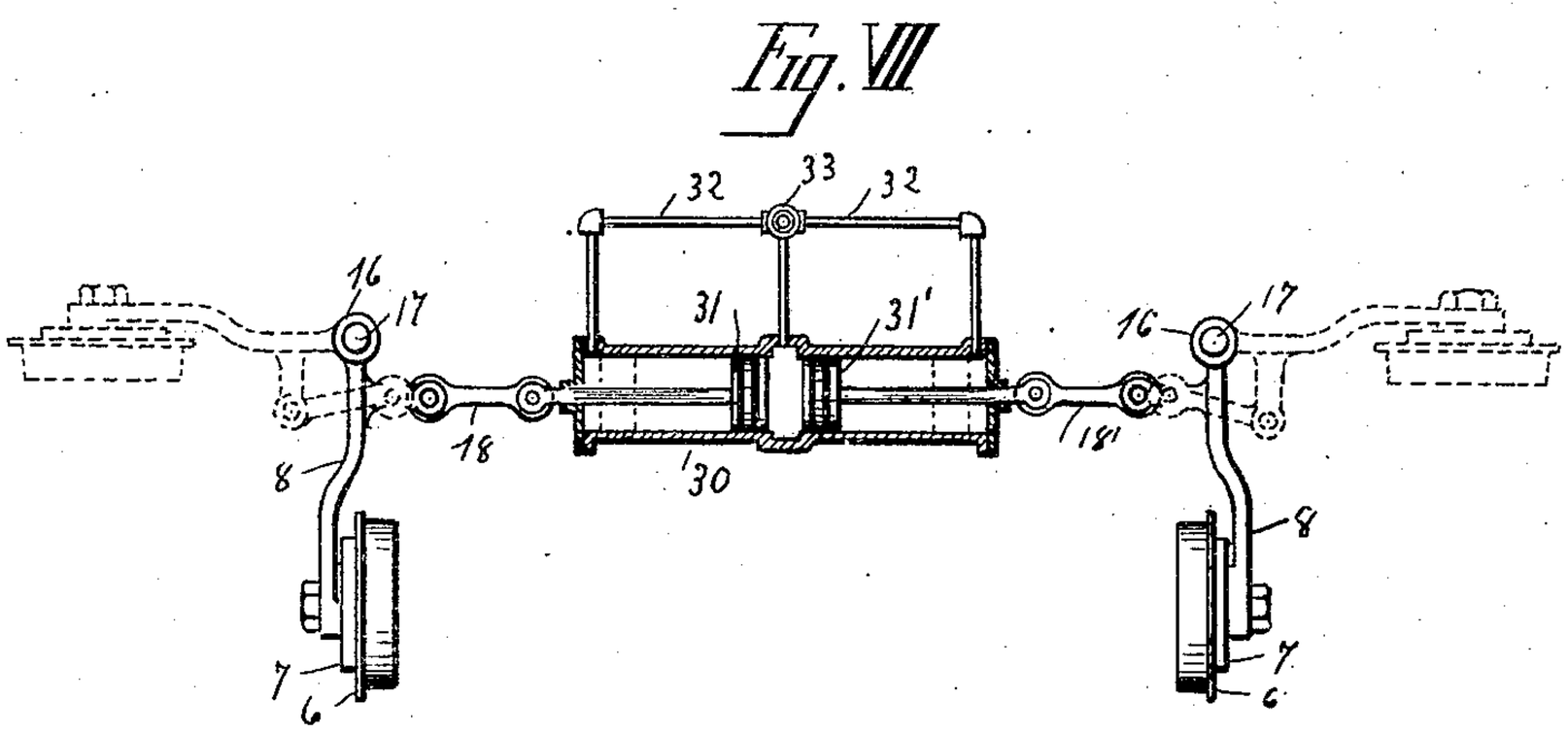
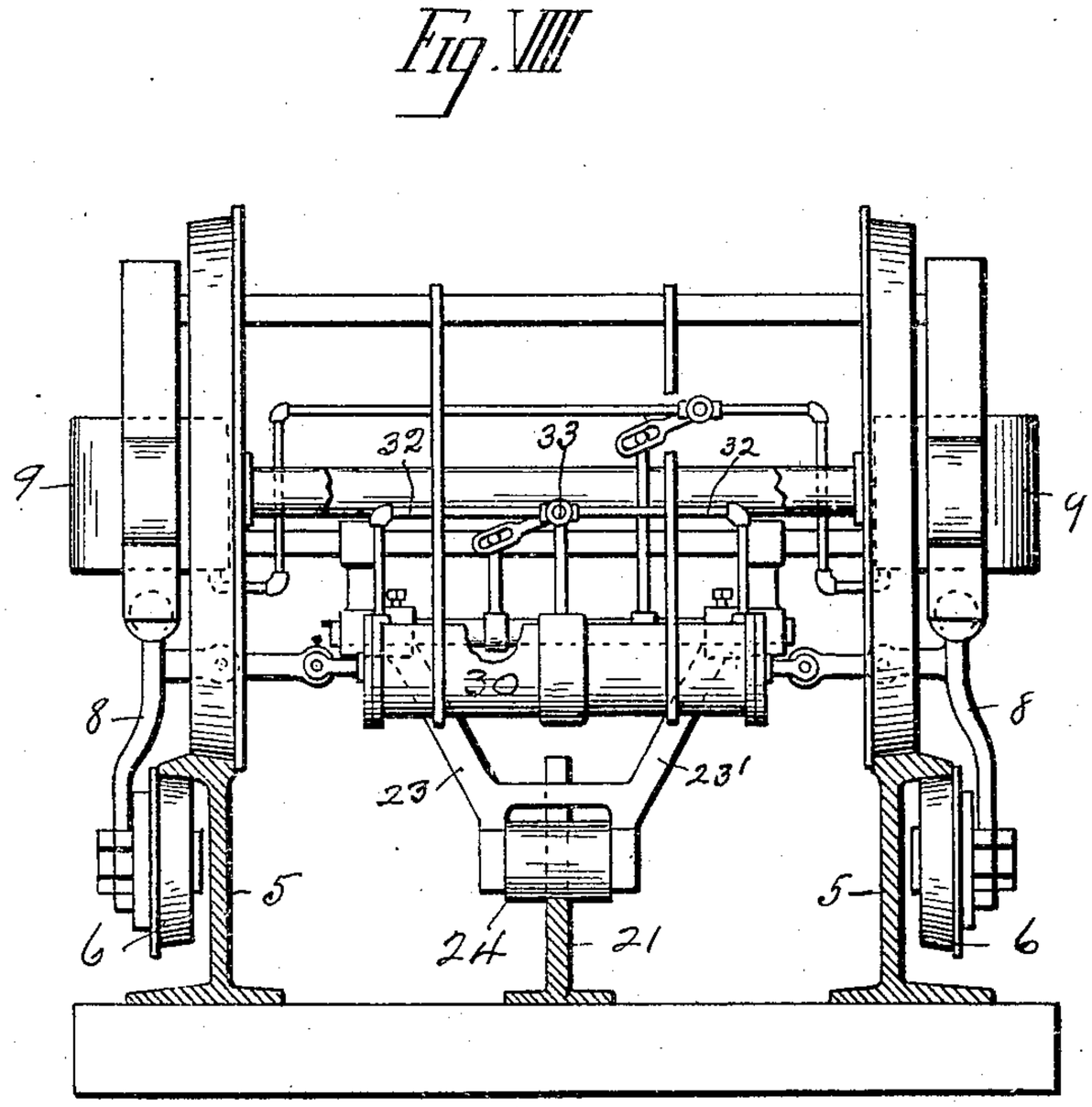


Fig. VIII



Witnesses:

Edw. Lindmueller.

W. F. Donnelly

Alcuin E Kintner

Inventor:

By W. E. Donnelly

His Attorney.

UNITED STATES PATENT OFFICE.

ALCUIN E. KINTNER, OF PAINESVILLE, OHIO.

TRACTION-INCREASING DEVICE.

938,490. Specification of Letters Patent. **Patented Nov. 2, 1909.**

Application filed March 16, 1908. Serial No. 421,540.

To all whom it may concern:

Be it known that I, ALCUIN E. KINTNER, a citizen of the United States, residing at Painesville, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Traction-Increasing Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to rapid transit, and has for its object first, providing means of safety in rapid transportation regardless of the speed at which the motor or trains are running.

Another object of this invention is the obtaining of traction on the rail independent of gravity pressure by means of an auxiliary device adapted to contact with the rail or rails beneath lines parallel to said rail or rails in such a manner that the rail or rails are gripped between the traction wheels and the traction is increased regardless of gravity pressure upon the rail, thus eliminating, practically, weight as a means of traction.

Still another object of this invention is to provide means in connection with the devices just above set forth, whereby the traction wheels may be brought into heavy contact with the rail as required.

A further object of this invention is to provide means whereby the traction regulating device may be automatically elevated and entirely removed from the rail, when desired for the purpose of switching or as occasion may require.

My invention consists first in providing a safety and traction increasing device by which a high rate of speed may be obtained with perfect safety.

My invention further consists in means connected with the safety and traction increasing means, whereby the said means may be regulated so as to increase or decrease the traction upon the rail upon which said wheels run.

My invention still further consists in providing means in connection with the safety and traction increasing device, whereby the traction increasing device may be entirely removed from contact with the rail, and further in providing and regulating said device so that the pressure is first released from the rail, and the device subsequently thrown from said rail, automatically or manually.

In the drawings Figure I, is a view in side elevation illustrating a pair of wheels, and a section of track and showing one method of applying and constructing my invention. In this view a portion of the air cylinder is removed to show more clearly the operation of the adjusting mechanism, which is, in this case, employed. This view also shows the initial operation of the releasing mechanism employed for throwing the traction regulating means and safety guard from the track. Fig. II is a view in end elevation looking to the left of Fig. I, and being partly in section at the right to illustrate more clearly the detail of construction employed in the asemblage as at present shown. This view also illustrates the guard and traction regulating device as applied and the mechanism for retaining the same in contact with the rails and for releasing the same either manually or automatically, as heretofore set forth. Fig. III is a view in side elevation of a motor car with my invention applied and shows one means for manually operating the guard and traction mechanism when the same is constructed as shown and described herein. This figure for clearness illustrates constructive details not essential in this connection. Fig. IV is a view in end elevation like unto the view shown in Fig. II, but shows the guard and traction mechanism released and away from the rail, with the relative position of the parts when such action takes place. Fig. V illustrates a modification of the cam construction which is positive in its action for the purpose of communicating action to the air release and feed mechanism employed for the purpose of controlling the traction increasing and safety appliance. Fig. VI illustrates a sectional view taken through the cam illustrated in Fig. V, and also through the crank wheel secured to the same shaft. In Fig. VII I have illustrated a modified method wherein is shown means for utilizing a pressure to accomplish the throwing out or displacing of the guard wheels. In Fig. VIII I have illustrated the means shown in Fig. VII as directly applied to the trucks and in connection with the traction increasing means.

In motor traffic systems as heretofore employed, and as illustrated in the prior art intended to prevent derailment of wheels of

cars or motor engines, and also evolved to increase or obtain traction, numerous constructions have been made, of these many are crude in the extreme and not adapted for the purpose intended, and others while attaining some of the necessary results fail to be practical on account of their not being adapted to meet essential requirements, all of which are provided for in my invention. The essential requirements being such for instance as providing for switching; uniformity of contact between the rails and the traction wheels; elimination of jar due to the uneven tread portion of the rail, or of open joints at rail ends. Wheels 6, 6′ traveling in opposite directions from the traction wheels, cancel vibration, and relieve the heavy jars or hammering effects at the joints, due to the unevenness of the rails, when the cars are going at a high rate of speed, and many other incidental and unavoidable defects of traffic necessarily encountered in rapid transit railways, all of which will be obvious to those skilled in railway traffic.

My invention is intended to obviate, as far as possible these above mentioned objectionable features and to correct the deficiencies of the devices as heretofore constructed; also to obtain as far as possible a perfectly operating means designed first, to obviate the necessity of employment of weight to obtain traction; second to eliminnate danger of derailment, third, to provide for uneven tracks, and fourth to provide for switches and crossings, and also to provide a device which is operative on elevated and surface roads, that can be changed from one to the other instantaneously. The device to be operated either automatically or manually.

In setting forth my invention I have shown in the drawings what I consider to be the most practical illustration of my invention, and in the following description I will describe the construction and operation of the parts as therein shown, which is as follows:

1 represents a car body of any suitable construction or contour, preferably of light weight, 2, a truck frame adapted to suitably support a car body or platform, and to form the bearings for one or more axles 3, 3, upon which are mounted wheels 4, 4, which may be traction wheels when the car is a motor car, or may be free running as in the case of a trailer or a traffic car, such as an express, or passenger car. The wheels 4, 4, are adapted at their periphery or tread portion to a track or rail 5, and are preferably provided with the usual flanges at their perimeter.

The traction regulator and guard or safety mechanism as adapted to the above set forth construction of vehicle and rail consists, in the case shown, and as it is illustrated in the drawings, of two wheels or rollers, 6, 6′, preferably flanged at their peripheries and adapted to engage the under portion of the rail head or tread 5, which is formed with an outer projecting flange, having a flat under face. This portion 5′, of the rail extends outward to a greater distance or extent than the inner part of the head or tread of the rail, thus giving a purchase for the wheels or rollers 6, 6′. Other mechanical devices may be used in place of the wheels or rollers 6, 6′, and still the same object be attained.

The wheels or rollers 6, 6′, are mounted on the cross head 7, which in turn is pivotally secured to an arm 8, in turn secured to the truck frame 2, in such a manner that it may be adjusted in relation to the rail 5, in a vertical direction, and also be moved horizontally in relation to the rail for the purpose of freeing the rollers 6, 6′, from the track head as illustrated in Fig. IV.

In order to attain the vertical adjustment relative to the under side of the rail, I have shown an air cylinder 9 which is secured in any suitable manner to the truck frame 2, one manner being shown in Fig. I which comprises side flanges 10, 10′ resting in ways 11, 11′, formed in the lower portion of the truck frame, with set screws 12, 12′, to hold the flanges 10 10′, in position within the truck frame. The cylinder 9 is provided with a piston 9′, which in turn is secured to the cross head 13, this cross head 13 moving with the piston 9, as the air is let into the cylinder 9, which releases the piston 9′, and as the air is allowed to escape from the cylinder, allows the piston 9′ to drop and thus the vertical movement is obtained.

Secured to the cross head 13, at its ends, are two slide rods 14, 14′, which slide in the ways formed in the lugs 15, 15′, at the upper end of the cylinder, and also in ways formed in the flanges 10, 10′, at the lower part of the cylinder, and it is thus that the slide rods 14, 14′, are sustained. At their lower ends the slide rods 14, 14′, as at 16, 16′, are formed with heads, provided with orifices into whih fit the projecting pintles 17, 17′, formed on the upper end of the arm 9. This connection between the parts allows of the outward oscillating lateral movement of the arms 8, while at the same time provides for the vertical movement relative to the attached parts. It will thus be seen that as the cylinder 9 is filled with air, the wheels or rollers 6, 6′, are drawn up, more or less tightly, to the outside of the portion 5 of the track, increasing the traction of the wheels 4, 4′, according to the pressure brought to bear, and entirely independent of the load upon the wheels 4, 4′, thus entirely eliminating as far as traction is concerned, the necessity of weight upon the head or tread portion of the rail or track 5.

In order to obtain the necessary movement

to displace the rollers 6, 6′, from the track, when found necessary, such as in the case of crossing with other tracks, or in case of a switch, I have provided a means, illustrated more clearly in Figs. II and IV, which comprises pitman arms, 18, 18′, secured to a crank wheel 19, by crank pins at one end, and at the opposite end secured pivotally as at 20, 20′, to the arms 8. Thus it will be seen that as the crank wheel 19 is revolved in one direction, see Fig. II, the arms 8, 8′, are drawn together toward the tracks so that the rollers 6, 6′, will come beneath the flange 5, and when the crank wheel 19, revolves in the opposite direction, see Fig. IV, the arms 8, 8′, are thrown outward and with them the rollers or wheels 6, 6′.

In order to accomplish automatically, the throwing out of the arms, into the position illustrated in Fig. IV, I provide a centrally located inclined rail 21, upon which rides the pivoted oscillating rack 22, which is formed preferably as illustrated in Figs. I and II of the drawings, comprising two arms 23, 23′, pivotally secured at their upper end to a suitable portion of the truck, and having a roller 24, at the free end, and a curved shaped rack 22 extending inward therefrom. The rack 22 engages a pinion 22′ mounted on a shaft or spindle 25, upon which is mounted the crank wheel 19. Thus it will be seen that as the roller 24 rides on the centrally inclined rail 21, the crank wheel 19 is turned to a position, indicated in Fig. IV, throwing the arm 8, 8′, and the rollers 6, 6′, away and outward from the track, but inasmuch as it is necessary to first release the pressure on the rollers 6, 6′, from the head 5′ of the track 5, before said rollers and their arms can be thrown outward, I have provided an air release 26 leading to both cylinders, which upon the initial movement of the rack 22, acts through suitable mechanisms to release the air from the cylinders 9, thus releasing the pressure.

As illustrated in Figs. VII and VIII it will be seen that instead of the mechanism just above set forth for displacing the traction and guard device, comprising in this case the rollers 6, 6′, I may employ a cylinder and piston mechanism, preferably operated by air, but in either case as it is more or less essential that the traction increasing mechanism, also embodying the safety mechanism, should be under the control of the operator, motor-man or engineer, I provide a line of shafting 25 which extends from the several trucks to the cab, or operators position, where it is operated manually as required or desired.

In the case of the mechanism illustrated in Figs. I, II, and IV being employed, the line of shafting is provided with knuckles or universal joints such as 28, which are provided to allow for the variations due to the curvature of the track, but in the case of air pressure being employed, the shaft 25 may be eliminated and a piping employed with flexible joints at predetermined points.

In Fig. VII as hereinbefore mentioned I have illustrated a device embodying a cylinder and piston construction for the purpose of operating the guard or guide wheels both toward and from the tracks on which the traffic or traction wheels travel. In this case 30 indicates a multiple cylinder having two pistons operated in opposite directions through the influence of pressure determined by means of pipes 32—32 and regulated by means of a valve 33 of suitable construction arranged to feed each cylinder and exhaust therefrom as found necessary.

As will be seen, the opposing traction-surfaces formed by the walls of the truck on the upper side of the rail and the wheels 6 on the under side of the rail, are not only out of vertical alinement by reason of the wheels 6 being mounted at a point where their contact with the rail will be at points intermediate the points of contact of the wheels of the truck, but in addition, the paths of movement of such traction-surfaces are out of vertical alinement, thereby providing a structure which does not require the use of wheels having flanges on both sides, requiring the tread of the wheel to be of a width equal to the width of the rail, but on the contrary permitting the wheels to have a relatively narrow tread and at the same time have a maximum width of traction-surface in contact with the rail; in addition, the fact that such paths of movement are out of vertical alinement insures a greater stability owing to the fact that the pressures of the opposing surfaces are not in direct opposition to each other, but are exerted in directions which tend in themselves to force the wheels into contact with the rail or to retain them in such contact during movements of the truck.

What I claim is:

1. In a traction system, a rail, a traveling support mounted on said rail, said support including a pair of spaced apart wheels taking a common path of travel, a traction-increasing mechanism carried by the support and operating in opposition to the wheels of the support, said mechanism being normally located intermediate the planes of the axes of the wheels, said mechanism including a laterally swinging support having wheels movable toward and from a position on the under side of the rail.

2. In a traction system, a rail, a traveling support mounted on said rail, said support including a pair of spaced apart wheels taking a common path of travel, a traction-increasing mechanism carried by the support and operating in opposition to the wheels of the support, said mechanism being

normally located intermediate the planes of the axes of the wheels, said mechanism including a laterally swinging support having wheels movable toward and from a position on the under side of the rail, said support also having an independent vertical movement to control the traction pressure.

3. In a traction system, a rail, a wheeled support movable longitudinally of said rail, and traction-increasing devices carried by said support and normally operating on an opposing surface of said rail, said devices having vertical and lateral movements to and from their normal position.

4. In a traction system, a rail, a wheeled support movable longitudinally of said rail, and traction-increasing devices carried by said support and normally operating on an opposing surface of said rail, said devices having vertical and lateral movements to and from their normal position, said movements being independent of each other.

5. In a traction system, a rail, a wheeled support movable longitudinally of said rail, traction-increasing devices carried by said support and normally operating on an opposing surface of said rail, said devices havin vertical and lateral movements to and from their normal position, and means for imparting said movements to the devices.

6. In a traction system, a rail, a wheeled support movable longitudinally of said rail, traction-increasing devices carried by said support and normally operating on an opposing surface of said rail, said devices having vertical and lateral movements to and from their normal position, and means for imparting said movements to the devices, said movements being independent of each other.

7. In a traction system, a rail, a wheeled support movable longitudinally of said rail, traction-increasing devices carried by said support and normally operating on an opposing surface of said rail, said devices having vertical and lateral movements to and from their normal position, and means for imparting said movements to the devices, said movements being independent of each other, and operable from a single point.

8. In a traction system, a rail, a wheeled support movable longitudinally of said rail, traction-increasing devices carried by said support and normally operating on an opposing surface of said rail, said devices having vertical and lateral movements to and from their normal position, means for imparting said movements to the devices, said movements being independent of each other, and means mounted on the road-bed for controlling the movements of the device-operating means.

9. In a traction system, rails, a wheeled carrier, and traction-increasing devices mounted on and movable with the carrier, said traction devices having movements toward and from an operative position, said movements being in vertical and lateral directions with respect to the operative position.

10. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, and traction increasing devices mounted on the carrier having an operative position in contact with the rails, said devices each being movable vertically and laterally to and from its operative position.

11. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, and traction increasing devices mounted on the carrier having an operative position in contact with the rails, said devices each being movable vertically and laterally to and from its operative position, said devices having their movements in unison.

12. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, traction-increasing devices mounted on the carrier having an operative position in contact with the rails, said devices each being movable vertically and laterally to and from its operative position, and independent means for imparting the several movements to the devices.

13. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, traction-increasing devices mounted on the carrier having an operative position in contact with the rails, said devices each being movable vertically and laterally to and from its operative position, and independent means for imparting the several movements to the devices, said movements being within adjustable limits.

14. Is a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a support movable vertically and also having a lateral swinging movement, said support having a traction surface, the movements of the support carrying the traction surface to and from a position in contact with the rail.

15. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a vertically movable support, a swinging carrier pivotally mounted on said support and movable laterally of the traction line, said swinging carrier having a traction surface normally in contact with the rail, and means for imparting movements to said support and said swinging carrier.

16. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a vertically movable support, a swinging carrier pivotally mounted on said support and

movable laterally of the traction line, said swinging carrier having a traction surface normally in contact with the rail, and means for imparting movements to said support and said swinging carrier, said means being operable by devices located in the path of movement of the wheeled carrier.

17. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a vertically movable support, a swinging carrier pivotally mounted on said support, said carrier having its movements in directions laterally of the path of travel of the wheeled carrier, a traction surface mounted on said swinging carrier, means for imparting movement to said support, and independent means for imparting the swinging movements to the swinging carrier.

18. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a vertically movable support, a swinging carrier pivotally mounted on said support, said carrier having its movements in directions laterally of the path of travel of the wheeled carrier, a traction surface mounted on said swinging carrier, fluid-operating means for imparting movement to said support, and independent means for imparting the swinging movements to the swinging carrier.

19. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a piston chamber, a piston movable vertically in said chamber, a support to which said piston is connected, a swinging carrier mounted on said support and movable in directions laterally of the path of travel of the wheeled carrier, said swinging carrier having a tractioned surface, means for imparting movement to the piston by a fluid pressure, and independent means for operating the swinging carrier.

20. In a traction system, rails, a wheeled carrier movable longitudinally of the rails, a traction-increasing mechanism mounted on the carrier, said mechanism comprising a piston chamber, a piston movable vertically in said chamber, a support to which said piston is connected, a swinging carrier mounted on said support and movable in directions laterally of the path of travel of the wheeled carrier, said swinging carrier having a tractioned surface, means for imparting movement to the piston by a fluid pressure, independent means for operating the swinging carrier, and movements of the independent means controlling the movements of the piston.

21. A rapid transit system comprising one or more wheels, and rails, said wheels traveling on said rails, means adapted to engage said rail or rails for the purpose of increasing the traction and retaining said wheel or wheels in relation to said rail or rails, said latter means being adjustable both in a vertical and lateral direction in relation to said rail or rails.

Signed at Cleveland in the county of Cuyahoga and State of Ohio, this 3rd day of March 1908.

ALCUIN E. KINTNER.

Witnesses:
W. F. DONNELLY,
J. J. DONNELLY.