

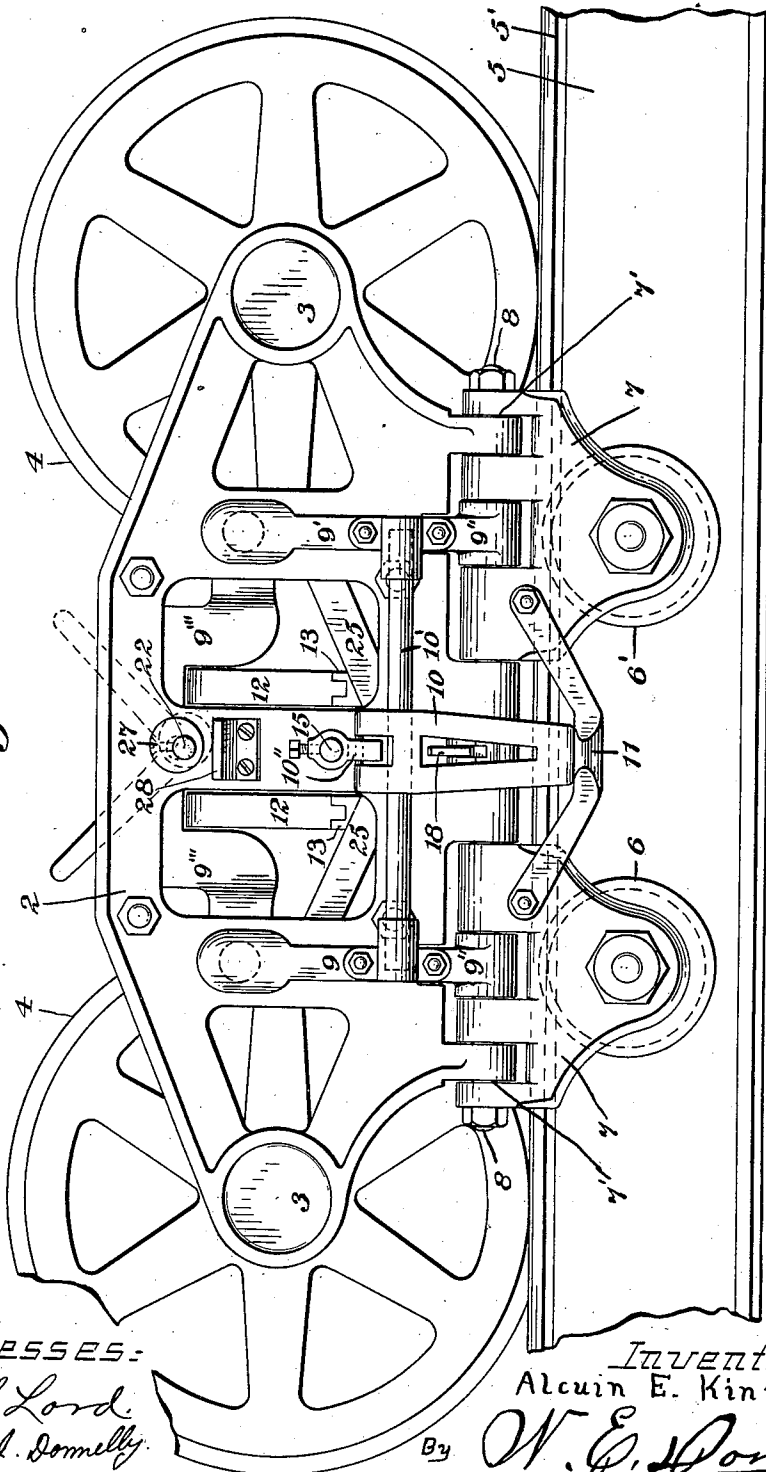
A. E. KINTNER.
TRACTION INCREASING AND SAFETY DEVICE.
APPLICATION FILED APR. 21, 1910.

1,024,084.

Patented Apr. 23, 1912.

3 SHEETS-SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

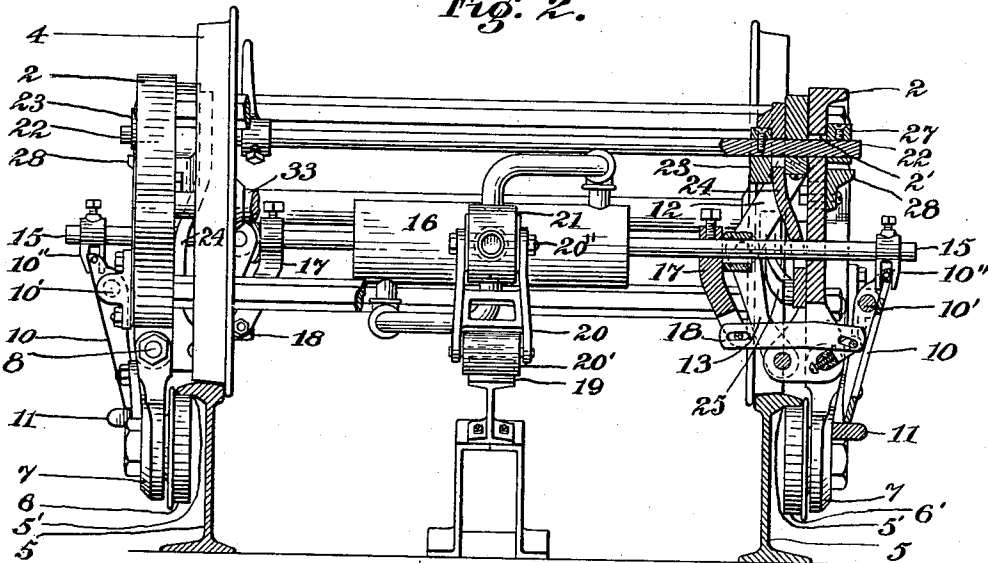
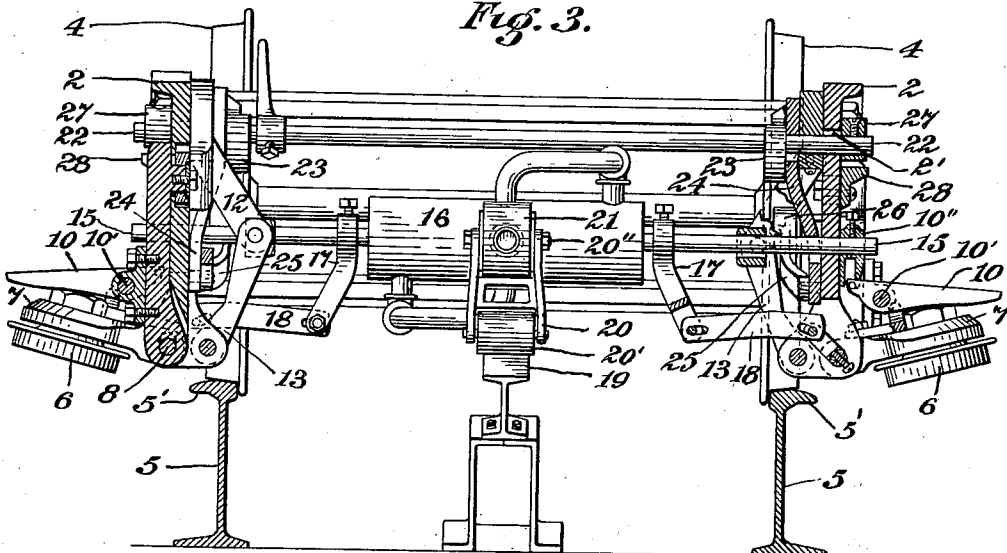


Fig. 3.



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UNITED STATES PATENT OFFICE.

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TRACTION-INCREASING AND SAFETY DEVICE.

1,024,084.

Specification of Letters Patent.

Patented Apr. 23, 1912.

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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 some certain new and useful Improvements in Traction-Increasing and Safety 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.

This invention relates to traction increasing and safety devices, and has for its object an improvement on the construction embodied in U. S. Patent No. 938,490, issued Nov. 2, 1909; said invention relating to and embodying a construction by which traction is attained regardless of or independent of gravity pressure, and by means of auxiliary devices adapted to contact with a rail or rails beneath lines parallel to said rail or rails, in such manner that the rail or rails are gripped between the traction wheels and the traction is increased regardless of the gravity pressure on the rails, thus eliminating practically, weight as a means of traction.

The main object of this invention is to improve upon the construction shown in the former application referred to above, first, by providing means in connection with traction increasing means, for controlling the speed of the wheeled support and stopping the same by means of a brake which operates on the wheels of the wheeled support, and at the same time bringing into action the traction increasing means, thus preventing the sliding of the wheels on the track, and in this connection also providing means for the greater increasing of the power of the brake mechanism in connection with the traction increasing means and having the same under control at all times.

Another object of this invention is to provide a manually operated emergency device in connection with the braking mechanism and traction increasing means, which may be used in emergencies regardless of and independent of the fluid pressure means adapted for operating the several mechanisms.

Another object of this invention is to operate the traction increasing means through a single controlling device, both for the purpose of moving the traction increasing means in a lateral direction toward and

from the rail, and in a vertical direction to engage or disengage the rail or operate in opposition to the wheeled support.

Still another object of this invention is to provide a locking means which will come into action against the traction increasing means when the same is caused to engage in alinement for traction increasing purposes, and lock the same in such position, which means for locking can be operated through the same controlling mechanism that operates to move the traction increasing device in a horizontal or lateral direction, or in a vertical direction, the entire operation being controlled preferably by means of air or other fluid operating through one or more suitable directing valves and controlling the movement of a piston or pistons in a cylinder.

Taken as a whole, the entire object of this invention is to so improve the construction of a rapid transit and safety appliance of the type set forth, that the entire mechanism is at all times under the control of the operator for the purpose of increasing or decreasing traction, slowing down or stopping of the mechanism or wheeled support, and providing an emergency brake mechanism which can be utilized and applied if for any reason the fluid pressure mechanism should become inoperative, for the purpose of stopping or braking.

My invention consists, first, broadly, in a wheeled support adapted to move on a rail; a traction increasing device coöperating with the wheels of the support and adapted to engage the rail; and a brake mechanism operating against one or more of the wheels of the support and acting in conjunction with the traction increasing means.

My invention further consists in an auxiliary emergency device or means, constructed and operated to bring into action the brake against the traction wheel of the wheeled support, and also bringing into action the traction increasing means; said emergency device being operated independently of the normal operating mechanism.

My invention still further consists in providing a single operative means controlled from a single point for bringing into action the traction increasing means to move the same in a horizontal or lateral direction toward, and away from the rail, and in a vertical direction to engage or disengage the rail.

My invention further consists in a locking mechanism (preferably automatically brought into action by the means of controlling the horizontal and vertical movement of the traction increasing device,) to lock and
 5 unlock the traction increasing device to and from its engaging position in relation to the rail.

Other features of the invention which are important to the practical operation, will be hereinafter fully set forth and claimed.

In the drawings, Figure I, is a view in side elevation illustrating an application of my invention, in which is shown a pair of
 10 wheels, a section of track, and such portions of the traction increasing means and the lock for the same and also the emergency brake mechanism, as can be seen from such view. Fig. II is a view in end elevation, partly in section, illustrating my preferred
 15 means or mechanism for operating the traction increasing device and locking the same in position. This view also shows the means for releasing the lock which holds the traction increasing mechanism in position in
 20 relation to the rail, which can be seen more clearly to the right of the figure in the sectional portion, and also illustrates a toggle mechanism for raising and lowering the traction increasing device and the mechanism
 25 for throwing the same out of engagement or contact with the rail. In this view the position of the parts are shown when the traction increasing device is in operative position in relation to the rail and in engagement
 30 with said rail. The central portion of this figure also illustrates the means whereby the action of the parts are controlled automatically by means of a device or devices located in the path of the movement of the
 35 wheeled carrier to move the traction increasing device from operative position relative to the rail. Fig. III is a vertical sectional view taken through a wheeled carrier, showing the position of the parts after the traction increasing means have been
 40 thrown from operative position in relation to the rail. Fig. IV, is a view in longitudinal section taken through the one side of the carrier, showing the inside mechanism, and is especially designed to illustrate the operation of the brake mechanism, such parts
 45 being moved as are not essential to the clear understanding of the operation of the mechanism. Fig. V, illustrates a means devised to be operable by a device located in the path of the movement of the wheeled carrier for automatically operating the traction increasing mechanism to a position such
 50 as illustrated in Fig. III of the drawings. Fig. VI, is a segmental view illustrating a position of the brake operating cam, which will be hereinafter fully set forth. Figs. VII, and VIII, illustrate constructions and
 55 types of tracks which may be employed,

and are designed to be employed in connection with this system.

The construction set forth in my previous application above mentioned, it will be noticed that separate mechanisms are employed for imparting the vertical and horizontal movements of the traction increasing device. It will also be noticed that in this former application no means are illustrated or set forth for supplying a direct braking
 70 means, as applied to the wheels of the carrier. It will also be noticed that while the construction heretofore shown and described in my former application is operative in all respects and practical, that the improvements set forth herein greatly add to the practical operation of the device and to the meeting of certain emergencies which may occur during the operation of a system
 75 of this type.

In setting forth this invention I have shown in the drawings and hereinafter described, constructions and means and operations which I at present consider to be practical, but I do not wish hence to be limited to these details of construction or operations, as it will be understood that they may be varied without departing from my invention.

In the drawings 2 represents a truck
 80 frame, which in this case as shown is adapted to suitably support a car body or platform, and to form a bearing for one or more axles 3, 3, upon which are mounted wheels 4, 4, which may be traction wheels when a car is a motor car or may be free running wheels when the car is a trailer or traffic car, such as an express or passenger car. The wheels 4, 4, are adapted at their periphery or tread portion to a rail 5, and are shown as
 85 being provided with flanges at their periphery. The traction regulator and guard or safety mechanism is adapted to any construction of a vehicle and rail and consists in the case shown and 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 of the rail 5, which is formed with an outer projecting flange having an under face. This portion 5', of the rail extends outward preferably to a greater distance or extent than the inner part of the head or tread of the rail, for the purpose of giving a hold for the wheels or rollers 6, 6'.
 90 It is obvious that 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 hangers 7, 7, which in turn are pivoted
 95 loosely in the lower portion of the truck frame as at 7', 7', in such a manner as to allow both of the horizontal and vertical movement of the said rollers and their hangers. This is accomplished by elongating the

bearings in the lower end of the truck frame which supports a pintle 8, passing through the lower end of the truck frame, through the elongated bearings and thence through the upper portion of the hangers 7, 7', which they engage tightly.

To obtain the vertical movement requisite for the increasing of the traction through the medium of the traction increasing rollers 6, 6', I secure by means of the pintle 8, to said hangers a frame comprising two arms 9, 9', the lower ends 9'', 9'', of which are connected to the pintle 8, and the upper ends of which pass through the truck frame, and are thence connected together through the medium of a cross head 9''', the passage through the truck frame by means of which the connection is made allowing of the slight vertical movement necessary to attain the increase of traction, or a vertical movement of the traction increasing devices.

10 represents a swinging lock, which is preferably mounted on a rock shaft 10' which in turn is mounted between two arms 9, 9', the lock 10 being adapted at its lower end to engage a cross keeper 11, in turn connected to two hangers 7, 7', and thus holds said hangers with their traction increasing devices in vertical position in relation to the under side of the rail, and preventing the same from assuming the horizontal position, or from becoming out of operative relation with said rail. This lock is operated through the medium of a piston rod 15 which also operates to give the traction increasing devices a vertical, or horizontal movement, the action of which will be hereinafter set forth.

By reference to Fig. IV it will be seen that the cross head 9''', is connected pivotally with the upper arms 12, 12 of toggles as at 12', 12', the lower arms 13, 13, being pivotally connected at their lower ends to bearings formed on the truck frame; the knuckles of the toggles are connected by the cross-head 14, through which loosely passes the piston rod 15. It will be understood, of course, that the cross-head 14 is pivotally connected at the knuckles of the toggles.

The piston rods, of which there are preferably two, one for each side of the carrier, the mechanism being duplicated, are provided with pistons which operate in cylinder 16, which in turn is fed with suitable fluid, preferably air, for operating the pistons with said cylinder to throw the piston rods outward or draw them inward. It is by the throwing out of the piston rods 15 that the toggle is operated so as to draw up the cross-head 9''', and with it the hangers 7, 7', and in order that the proper adjustment may be made as to the action of the piston rods in relation to said toggles an adjusting arm 17, the upper end of which constitutes a collar, is adjustably secured to said piston rod.

The lower end of the adjustable arm 17 is connected to a link bar 18 which in turn is connected with the pintle 8, in such a manner as to give to said pintle 8, and its attached hangers 7, 7', the necessary rocking motion to impart the horizontal or vertical position to said hangers and their mounted rollers in their relation to the track as shown in Figs. III and II.

The link bars 18 are slotted or provided with means to allow for taking up of lost motion which may be required according to mechanism used, and to the adjustment of said mechanism. It will thus be seen that as the piston rod is drawn inward or outward, that the traction increasing device is caused to decrease or increase its bearing against the rail, and inasmuch as the toggle arms are designed to be always at an angle in relation to each other, the cushion effect of the air or fluid in the cylinder acts directly upon the traction increasing devices in their relation to the rail, accommodating itself to any inequalities of the rail due from any cause, thus eliminating to a great extent noises otherwise incident to traffic of this type.

The piston rod 15 extends outward through the frame 2, so as to be provided with means such as a short arm 10'' which is bifurcated and straddles the upper end of the lock 10. It will thus be seen that the first action of the piston rod as it is being drawn inward is to release the lock 10 from the keeper 11, and then through means of the link bar 18, and the arms 17, to throw out the hangers 7, 7', to a position shown in Fig. III; the reverse action of the piston rod is to first draw the hangers inward to the position illustrated in Fig. II, and then to throw the lock 10 into position on the keeper 11. In a further action of the piston rod in the outward direction, the arm 17, at its collar portion operates against the cross-head 14, of the toggle and raises the traction increasing device in contact with the rail, which contact may be increased or decreased according to the air pressure.

It will be seen from the above that a single cylinder is all that is requisite, with the single means, such as the necessary fluid to operate in said cylinder and against said pistons for operating the traction increasing mechanism, either in vertical or lateral movement of the same, and hence requires only that the fluid be directed through the medium of a suitable valve or valves to the proper part of the cylinder to act against the piston therein in a proper direction to accomplish the results hereinabove set forth; the controlling of the valve or valves being in the hands, figuratively speaking, of the operator under ordinary conditions and for the purpose of automatically releasing the traction increasing mechanism and throwing

it from, or out of contact with, the rails in position illustrated in Fig. III, the valve may be operated through the medium of a central inclined way or rail 19, placed in the line of travel, and which is adapted to engage with a trip arm 20, upon the lower end of which is a roller 20' which contacts with the inclined rail 19, the opposite end of said arm 20, being secured to the valve spindle as at 20'' of the valve 21, thus letting the air into the several branches leading to the central portion or either end of the cylinder 16. The first action of this automatically operated device being to release the tension between the traction increasing device and the rails, unlock the swinging lock 10, and throw out the traction increasing device as illustrated in Fig. III of the drawings, when they are clear from the rails and crossings or any such obstacle on the line of the rail which might interfere with the traction increasing devices when in position illustrated in Fig. II, such as a crossing and certain kinds of switches.

I will now take up the combined brake mechanism acting in conjunction with the traction increasing device, which is also operated through the medium of the fluid in the cylinder 16 through its pistons and piston rods 15.

22, represents a shaft which is pivotally mounted on the cross-head 9'', and passes through the frame 2, through a slotted opening 2'. This shaft 22 is provided at its ends with cams 23, located internal of the frame 2, and in such a manner as to engage with a bar 24, through which the shaft 22, passes, an elongated orifice being provided for such passage. The lower end of the cam bar 24, is connected to the toggle arms 25, 25, having brake shoes at their ends which engage the wheel 4, and thus it will be seen that as the cam is thrown over to proper position, the toggle is operated to cause the brake shoes 26, 26, to tightly engage the wheels and bring them to a stop, but inasmuch as independent of the traction increasing device, the wheels 4, would now depend upon their traction on the rails for the stoppage of the carrier, and according to the momentum or inertia would slide along said rails, I have found that it is also necessary to bring into action the traction increasing means to such a point as to bring the wheels 4, 4, in close relation to the rails, causing a clamping action between wheels 4, 4, and guard wheels 6, 6'. As a matter of fact this clamping action can be made so great that it would be impossible for the carrier to move in relation to the rails. It will also be noticed in this connection, that as the cam is thrown into position illustrated in 6, the toggle arms 12, 13, will act directly through the medium of the bar 24, both to set the brake shoes tightly, and

bring the traction increasing mechanism firmly to the under side of the rails. It is apparent that the shaft 22 may be operated by any suitable means within the control of the operator to bring it to the proper position for the setting of the brakes through the medium of the traction increasing mechanism.

Inasmuch as it may be found necessary, under extraordinary conditions and in case of emergency, to set the brakes in connection with the traction increasing mechanism by means independent of the fluid pressure means, such as in case of a leakage or a want of proper fluid pressure, I have provided on the outer ends of the shaft 22, auxiliary cams 27, which as they are revolved to proper position act in conjunction with the cams 23 both to set the brake by raising the traction increasing devices and setting the brake shoes, the brake shoes being set by the further movement of the inner cams 23, and the traction increasing mechanism being operated to bring it in contact, with the under side of the rail through the medium of the cams 27. Thus it will be seen that the braking or stopping of the carrier is not dependent entirely upon the fluid pressure or the means for automatically operating the traction increasing devices, but can be operated independently of, and separately from in case of emergency, as hereinbefore stated. It will be noticed that the cams 27, operate against a face 28, secured to the frame 2 and inasmuch as the cross-head 9'' moves with the shaft 22, in a vertical direction, that said cross head 9'' with its connected arms 9, 9', will be raised and in connection therewith, the traction increasing device.

In Figs. VII and VIII, I have illustrated constructions or types of tracks adapted for the system of traction above set forth, and it will be noticed in this connection I have shown in Fig. VII a construction in which an ordinary rail is mounted upon an I beam structure, in which case the carrier wheels would move upon the upper face of the track, and the traction increasing wheels could either engage the under face of the head of this track at one side, or, the under face of the I beam. In the construction shown in Fig. VIII, it will be seen that the rail proper upon which the carrier moves, is formed separate from that portion of the way or track with which the traction increasing devices engage, and that the portion with which the traction increasing devices engage is to one side of the main rail or track and slightly elevated. These constructions as shown in Figs. VII and VIII are for illustrative purposes and to enforce the fact that in the employment of the word rail I do not wish to be limited to a single construction, inasmuch as this

word rail embraces a way upon which the carrier may travel and an oppositely disposed surface for engaging with the traction increasing device, so that said traction increasing device will operate normally in opposition to the wheels of the carrier, and hence, as above stated, in the use of the word rail and in the use of the words opposing surfaces relative to the surface upon which said wheels supports move, it is intended to embrace, as above set forth, a rail or way upon which a wheeled support moves, and a surface upon which a traction increasing device operates, opposed to the surface upon which the wheeled support moves. It will also be noticed that in setting forth this invention I have employed the words horizontal movement and horizontal direction relative to a lateral movement of the traction increasing devices in their relation to rails, and while as a matter of fact the movement is an oscillating one in a lateral direction, I do not wish to be limited in this respect to the direction or amount of said movement, providing that the function of the movement of the traction increasing device relative to the rail or way is attained.

Other features of detail set forth in this specification and illustrated in the drawings can be modified, and will be modified under different conditions, according to the structure and the requirements, and hence I do not wish to be limited to those shown and described.

What I claim is:

1. In a traction system, a rail, a wheeled support movable on said rail, a traction increasing device movable with said wheeled support and normally operating on an opposing surface relative to the surface upon which said wheeled support moves, a brake mechanism adapted to engage a wheel or wheels of said wheeled support, with means for bringing into coöperation both the traction increasing device and the brake.

2. 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, a brake mechanism adapted to engage the wheels of said

support and to co-act with the traction increasing device, with means for bringing into coöperation the traction increasing devices and the brake mechanism.

3. In a traction system, a rail, a wheeled support movable longitudinally to said rail and traction increasing device carried by or movable with said support and normally operating on an opposing surface relative to the surface upon which said wheeled support moves, said traction increasing devices having vertical and lateral movement to and from their normal position, a brake mechanism adapted to engage the wheels of said support and to coöperate with said traction increasing devices with means for bringing into action said coöperation for the purpose set forth.

4. In a traction system, a rail, a wheeled support movable on 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, brake mechanisms adapted to engage the wheels of said support, and a single motive mechanism for bringing into action the movements of the traction increasing device and the brake mechanism.

5. In a traction system, a rail, a wheeled support movable on said rail, a traction increasing device movable with said support and normally operating on the surface opposed to the surface upon which the wheeled support operates, said traction increasing device having a vertical and lateral movement to and from their normal position, with means for locking said device in operative position in relation or juxtaposition to the rail; said locking means being operated through the same motive power that operates to impart the movement to the traction increasing device.

Signed at Cleveland in the county of Cuyahoga and State of Ohio, this 12th day of April 1910.

ALCUIN E. KINTNER.

Witnesses:

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FRANK C. GREGG.