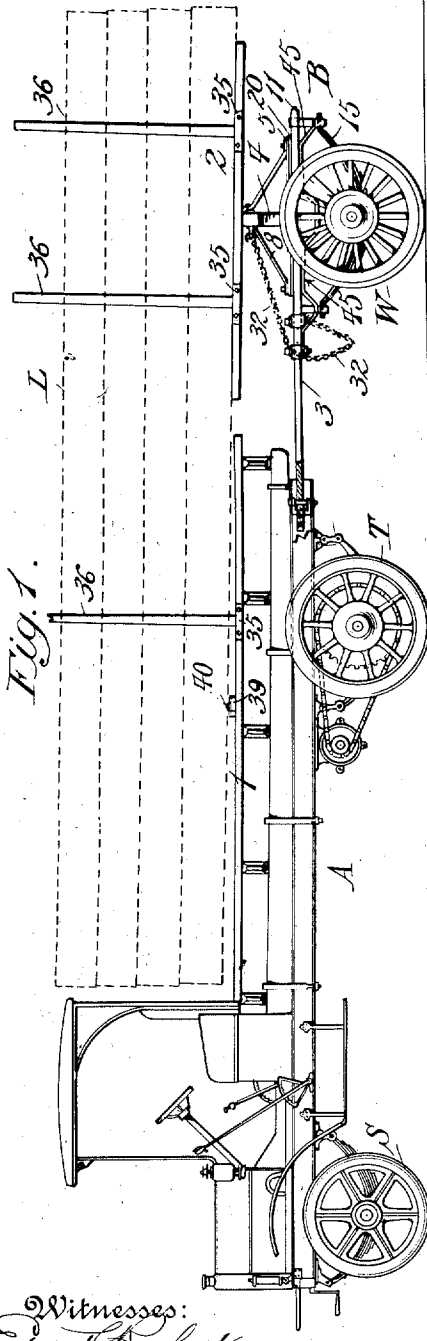


W. E. PAINE.
ART OF TRACTION VEHICLES.
APPLICATION FILED FEB. 9, 1912.

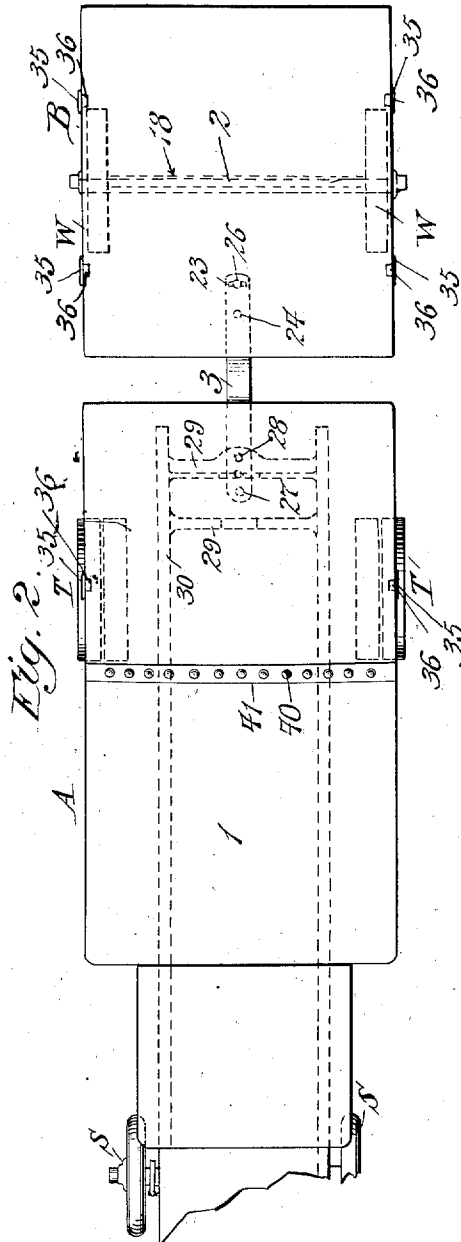
1,025,714.

Patented May 7, 1912.

5 SHEETS-SHEET 1.



Witnesses:
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5 SHEETS-SHEET 2.

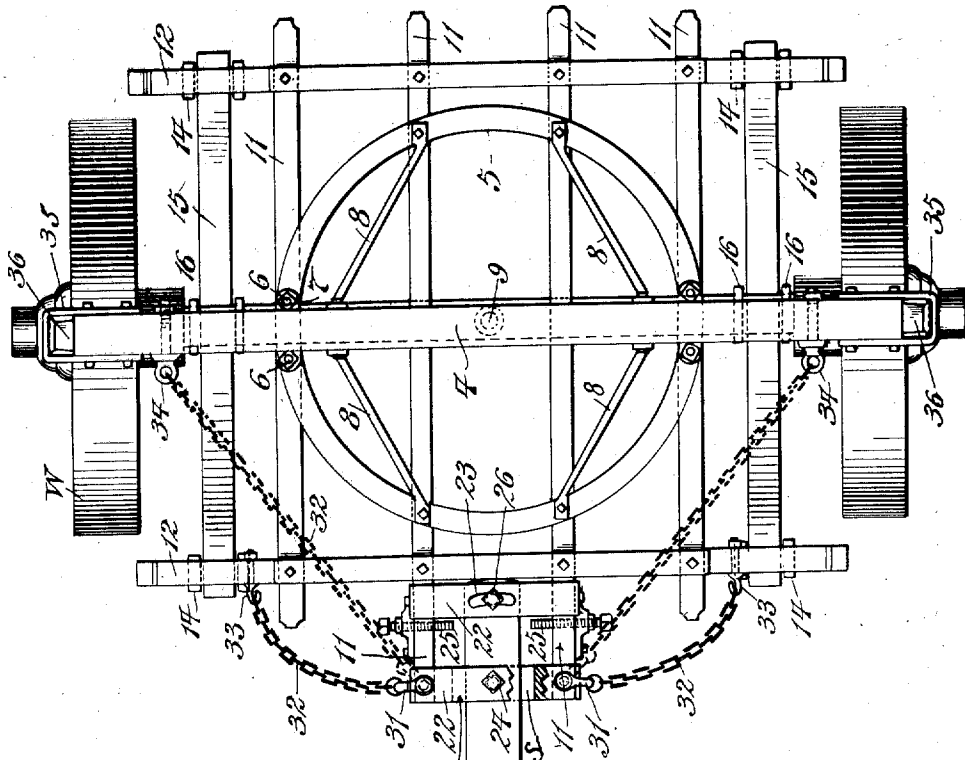
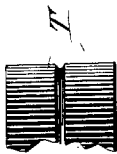
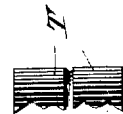
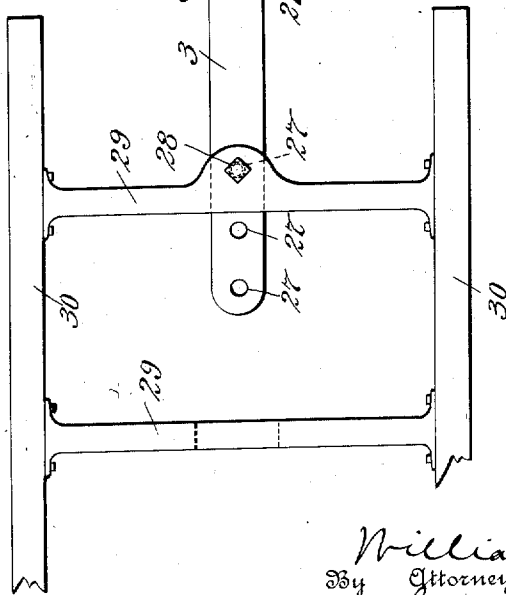


Fig. 3.



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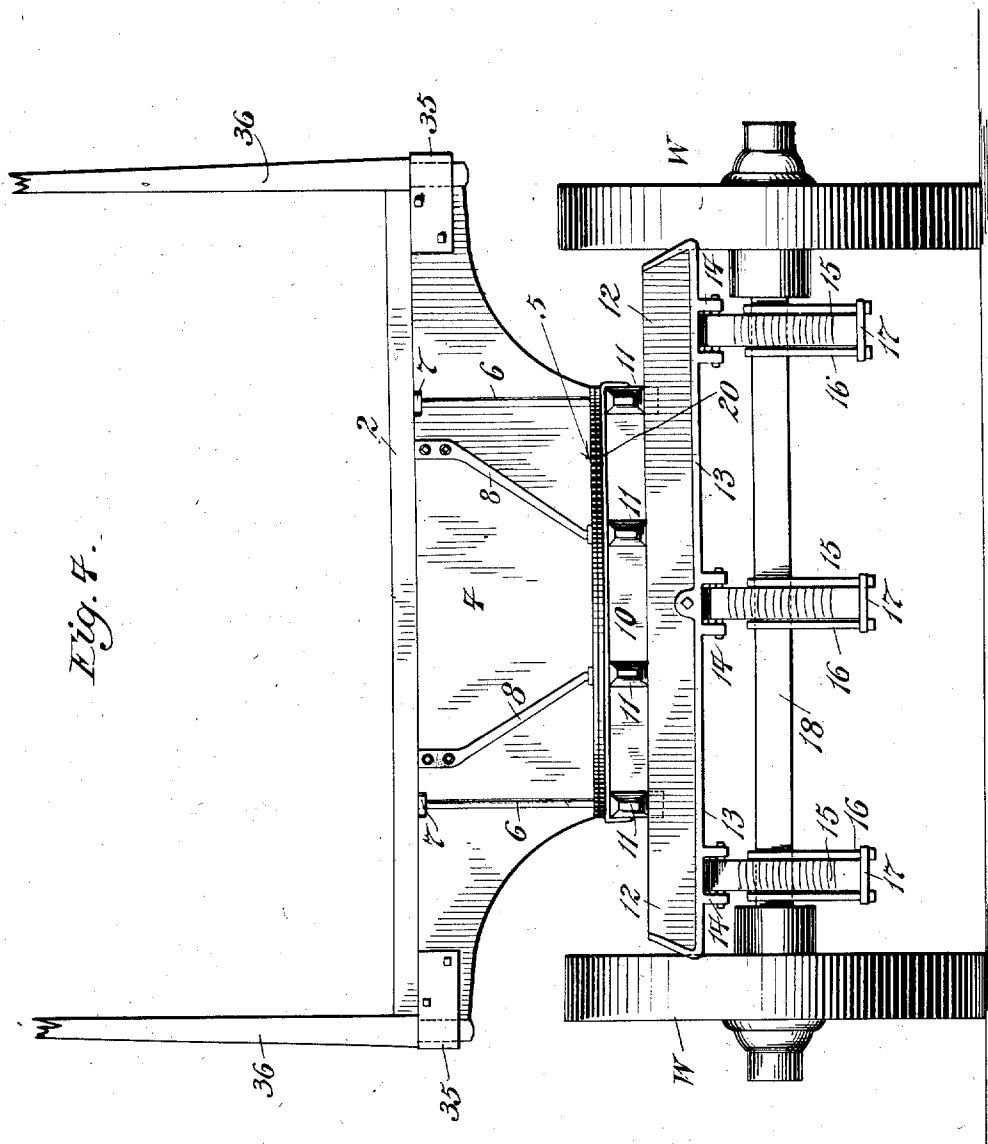
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5 SHEETS-SHEET 3.



Witnesses:
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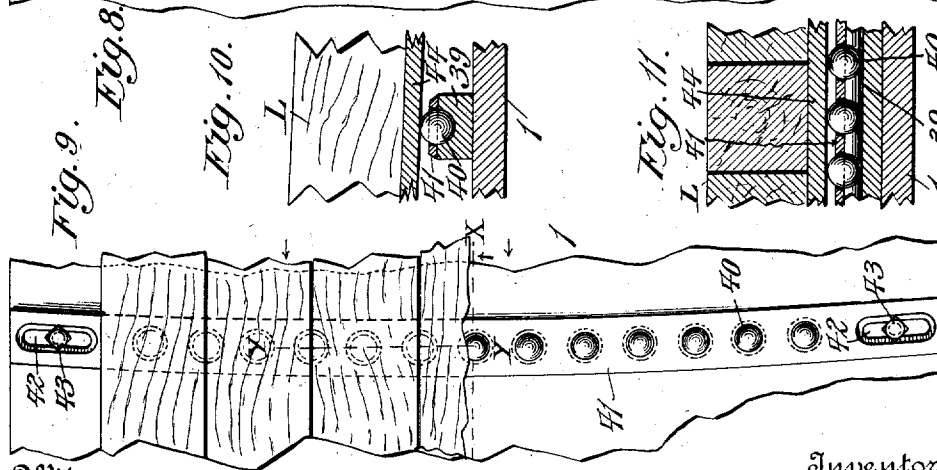
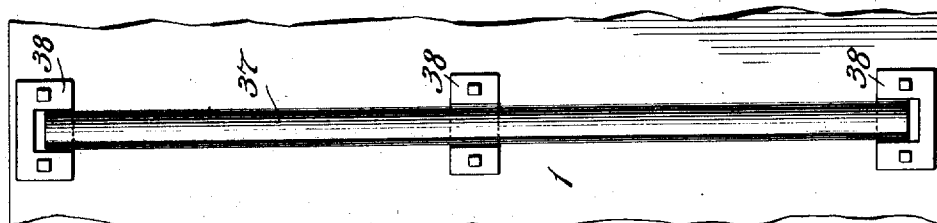
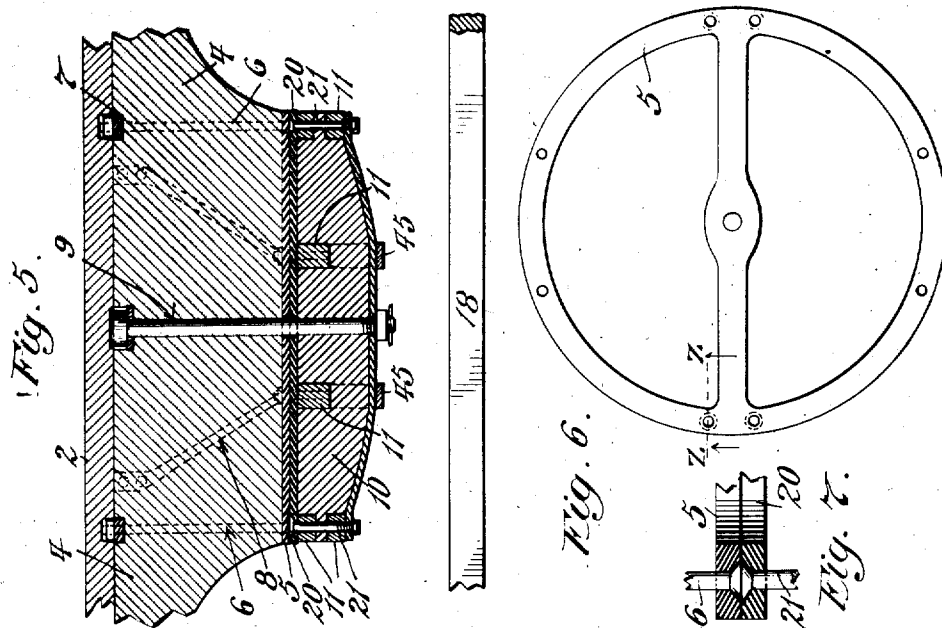
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5 SHEETS—SHEET 4.



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5 SHEETS-SHEET 5.

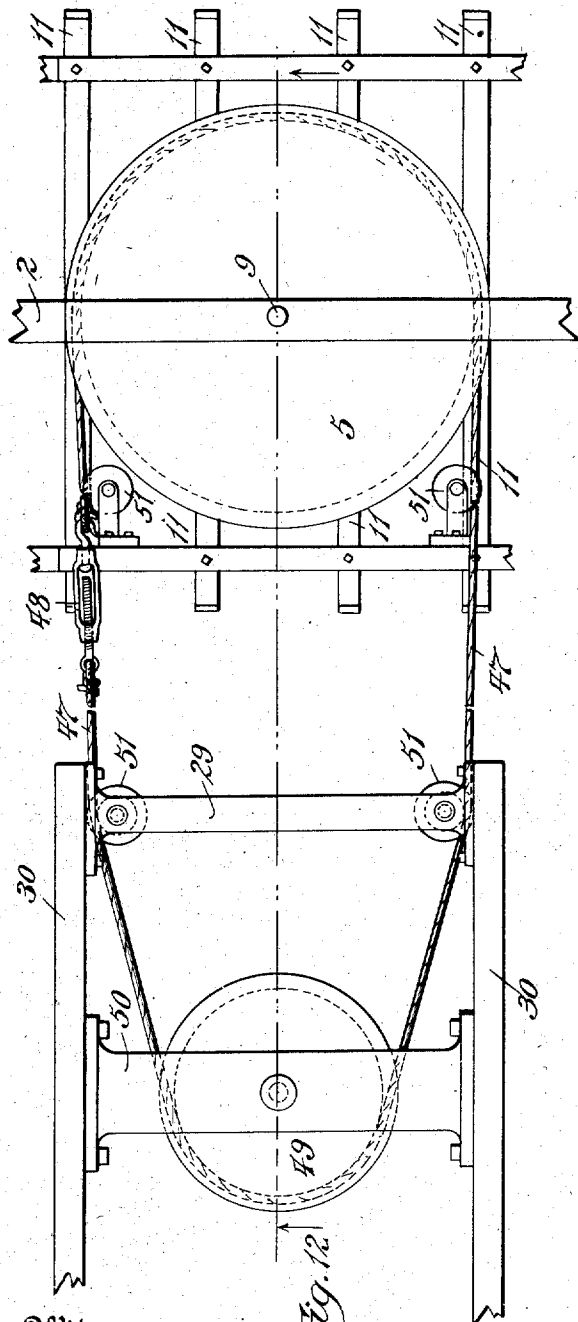


Fig. 12

Witnesses:
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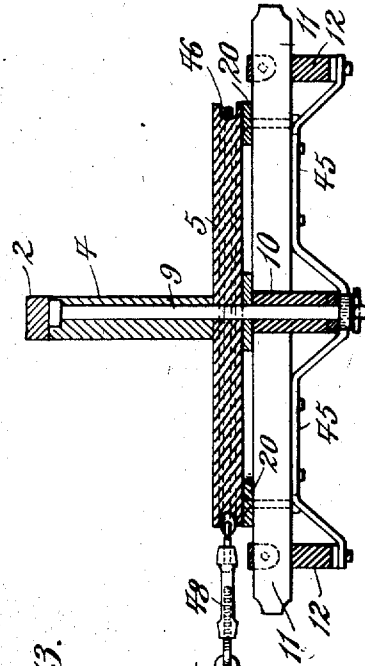
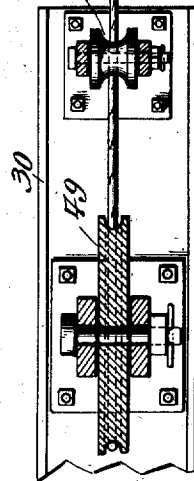


Fig. 13



Fig. 14



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UNITED STATES PATENT OFFICE.

WILLIAM E. PAINE, OF NEW YORK, N. Y.

ART OF TRACTION-VEHICLES.

1,025,714.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed February 9, 1912. Serial No. 676,589.

To all whom it may concern:

Be it known that I, WILLIAM E. PAINE, a citizen of the United States, and resident of New York, borough of Manhattan, county and State of New York, have made a new and useful Invention in the Art of Traction-Vehicles, of which the following is a specification.

My invention is directed particularly to a novel method of and apparatus for carrying heavy loads through the agency of traction vehicles, and it has for its objects, first, to combine a self-propelled traction vehicle having two or more wheels with a trailer in such manner as to carry all loads thereby with the application of a minimum amount of energy. Second, to effect the carriage of the load with such vehicles in such manner that the center of gravity of the load shall always be acted upon by the motive or propelling force in a straight line, whether the vehicle be moving in a direct line or turning at various angles in its course of procedure. Third, to provide a traction vehicle for the transmission of heavy loads in which the pull exercised by the traction part of the vehicle can be adjusted to a minimum for any grade up which it is desired to carry the load—or on a level. Fourth, to provide a traction vehicle for relatively long loads which can pass along the crowded streets of a city at all times and without interfering with traffic. Fifth, to provide a traction vehicle of relatively great length for conveying long and heavy loads which shall be capable of turning in the shortest possible space. Sixth, to provide a traction vehicle for use with relatively long loads which shall be capable of turning in a minimum space and in such manner that the rear wheels of the vehicle will always follow substantially in the track of the traction wheels and that the rear end of the load will not endanger, harm, or injure any person or any thing by reason of such turn. Seventh, to provide a vehicle for the transportation of long heavy loads in which the load will automatically adjust itself on curves so that the axial line thereof will be adjusted as the vehicle proceeds in accordance with the direction in which it proceeds and that the line of center of gravity of the load will always be in the line of transmission of least resistance to the propelling motor or source of power. Eighth, to provide a traction vehicle which will carry either relatively long loads or

relatively short loads of lumber or other merchandise without the necessity of fastening or tying it to the vehicle in any manner.

For the transmission of loads upon wheeled vehicles it is well known that with two wheeled vehicles, where the center of gravity of the load is located in advance of the axle of the wheels which carry it and behind the source of power so that the load is relatively balanced when the driver is in his seat, the load may be drawn with a minimum amount of power; as, for instance, in the well known hansom cab drawn by a horse, and in two wheeled trucks where the load is located as above; this because the center of gravity can be placed relatively near to the propelling power, and also because any change of direction of the application of the power is effected with a minimum amount of resistance. In the carrying of heavy loads, however, it has not heretofore been possible to effect this relation of the center of gravity of the load and the propelling power. I have discovered that this is possible by the application of self-propelled vehicles having three or more wheels and a trailer having one or more wheels, and by so arranging and constructing the vehicle and the trailer that the major portion of the load rests upon the trailer with the center of gravity always in advance of the axle thereof and with the minor portion of the load resting upon the front or propelling vehicle, and at such a point in advance of the traction wheel or wheels that there shall be a sufficient gravitating effect to furnish the necessary traction. I have discovered also that by furnishing rotatable means, in the nature of a turn table or equivalent device to the trailer and with means for effecting certain adjustments which I will hereinafter describe, I can carry any load having any weight or length, dependent upon the carrying strength and power of the vehicle, and with a minimum application of power, and can so control the movement of the entire vehicle that the center of gravity of the load shall always follow with relative accuracy in direct alinement with the point of application of power and thereby accomplish the results hereinbefore mentioned as coming within the terms of the objects of my invention.

In the use of four-wheeled traction vehicles for carrying relatively heavy loads drawn by horse or any other source of power

located ahead of the vehicle, the power required depends upon two conditions; namely, the distance of the application of power from the center of gravity of the load, and the direction in which the vehicle may at all times move, the line of least resistance being offered to the vehicle when moving in a straight direction and all of the wheels are rolling straight ahead, the line of greatest resistance being that in which the vehicle is moving when turning to the right or left—a maximum at 45° ; that is to say, this resistance is equal to the tangent of the angle of movement. This is because the axles of the rear wheels which carry generally the major portion of the load offer at that time a maximum end-thrust, which end thrust diminishes in amount as the front wheels pass from 45° to 90° , at which time there is again required a minimum amount of power because the entire motion of all of the wheels is a rolling motion, the steering wheels having a forward motion and that of the traction wheels a rotary motion which has a center of rotation at the center of the rear axle.

My invention, therefore, contemplates also the adjustment of the relative angular relation of the several wheels of the vehicle, such that when the steering wheels reach the maximum angle of deviation the wheels of the trailer shall always have a like reverse angular position so that the traction wheels are the relative center about which the vehicle may turn and the friction offered to the application of power is found to be, when the vehicle is constructed and adjusted properly, such that the power required to transmit the load is due solely to rolling motion and does not involve the wasted application due to thrust action as I have before pointed out, a condition of affairs which is not found in any existing vehicle known to me, adapted to transmit heavy loads.

For a complete understanding of the invention, such as will enable others skilled in the art to construct and use the same and practice the method of such use, reference is had to the accompanying drawings, in which,

Figure 1 is a side elevational view of my complete apparatus; Fig. 2 is a plan view thereof as seen looking at Fig. 1 from the top toward the bottom of the drawings; Fig. 3 is an enlarged plan view of the rear end of the chassis of the traction engine or motor vehicle and a portion of the double traction wheels on the left with a complete plan view of the trailer, and my method of connecting it to the motor vehicle. Fig. 4 is an enlarged end view as seen looking at Fig. 3 from right to left upon the supposition that the traction engine has been disconnected. Fig. 5 is a detail sectional view taken through the body part of the bolster show-

ing the manner of connecting together the two parts of the turn table. Fig. 6 is a plan view of the upper or movable part of the turn table. Fig. 7 is a detail sectional view of a part of the upper and lower fixed parts of the turn table, showing the manner of connecting them to their respective supporting parts. Fig. 8 is an enlarged plan view of that portion of the mechanism which supports the minimum part of the load upon the motor vehicle; and permits of the lateral shifting thereof. Fig. 9 is an enlarged detail plan view of a modified form of the same part, a portion of the load being shown thereon. Fig. 10 is a sectional view taken through Fig. 9 on the line X—X, as seen looking thereat in the direction of the arrows. Fig. 11 is a similar sectional view taken through Fig. 9 on the line Y—Y as seen looking from right to left in the direction of the arrows. Fig. 12 is a plan view of the rear or skeleton end of the motor vehicle and a modified form of my invention showing the application of a different means of regulating the movement of the load upon the entire vehicle. Fig. 13 is a sectional view taken through Fig. 12 as seen looking thereat in the direction of the arrows. Fig. 14 is a sectional view of a pulley designed to take two or more coils of operating cord or chain shown in Figs. 12 and 13 when it is desired to lengthen or shorten such cord or chain.

Referring now to the drawings in detail in which like letters and numerals of reference represent like parts wherever used, A represents any well known form of motor truck or vehicle provided with traction wheels T having flexible tires and steering wheels S. This vehicle is sufficiently strong in all of its parts to support upon the traction wheels very heavy loads, and B represents a trailer with two wheels W, W made of unusual strength and provided with broad tread steel tires.

1 represents the bed or platform securely fastened to the motor vehicle in the usual manner and of proper width to support the load it is required to carry.

2 represents a bed or platform on the trailer or a bolster for the trailer.

3 represents a pivoted reach designed to connect the trailer to the chassis, as will be described later on.

4 (see Figs. 4 and 5) represents a rotary bolster for the trailer wheels and 5 the upper rotary part of a turn table secured to the bolster by U-bolts 6, 6 and cross bars 7, 7, extending above the bolster and also by braces 8, 8, secured to the same through holes in the turn table, as illustrated in Figs. 4, 6 and 7.

9 represents a king-bolt which is passed through the center of the rotary bolster 4 and seated with its head counter-sunk in 130

the same, said bolt joining together, by a nut and cotter pin, the rotatable bolster 4, the movable part of the turn table 5, and a second stationary bolster 10, the latter supporting the stationary part of the turn table 20, which parts are in turn supported by four longitudinal bars 11, 11, 11, 11 supported in turn by two iron cross bars 12 parallel with the axis of the trailer and are provided with horizontal flanges 13 and three lugs or ears 14 to which the end springs 15 are attached, and they in turn are connected to the axle 18 by three strong U-bolts 16, 16, 16 and metal cross plate 17, 17, 17 so that the parts when connected as described have sufficient strength to carry any load it may be desired to place upon the axle 18 and steel tired wheels W, W. The two central longitudinal bars 11, 11 are of greater length than the two outside bars, for the purpose of forming a pivoted supporting box for the reach 3. This box is formed of two pairs of parallel cross bars 22 which are secured directly to the outer ends of the two central longitudinal bars 11, 11 and on both sides thereof. The rear end of this reach 3 is provided with slots 23, 24 being a pivot bolt for pivoting the same to the outer pair of cross bars 22.

25 are iron adjusting screws secured through iron cleats bolted to the outer side of the longitudinal bars 11 and extending inward a definite distance in the box and provided with set-nuts for firmly securing them in place; their function, together with blocks secured between the outer pair of cross bars 22, being to limit the rotation of the trailer, a space *s* of practically one inch being shown on each side of the vibrating reach.

26 is a bolt carried by the reach 3 in the rear end of the same and adapted to play through two slots 23 in the rear cross bars 22.

27, 27, 27 are holes in the reach, the three upon the left for adjusting it longitudinally with a bolt 28 extending through the reach and through a cross bar 29 in the rear end of the chassis frame 30, a second cross bar being shown in advance for housing the reach when the latter is drawn forward and the bolt 28 placed in the single central hole 27 which causes the trailer to assume a relatively close position to the motor vehicle, thereby preventing boys or persons generally from attempting to ride upon the reach.

31, 31 are pivoted eyes located on the forward ends of the central longitudinal bars 11 for carrying the lower ends of the two guiding chains 32, located respectively on opposite sides, which are adapted to assume either one of two positions by connecting them to hooks 33 in the forward cross bar 12, or by connecting them in a taut extend-

ing condition to stationary eyes 34, 34 on the rotary bolster 4.

35 are metallic sleeves formed by U-bolts on the ends of the bolster 4 for receiving load holding rungs 36, 36 (see Figs. 1 and 4).

37 (see Fig. 8) is a steel anti-friction roller adapted to permit the load to be shifted laterally and is preferably about 4 inches in diameter. This roller is journaled in three journal bearings 38 carried by the bed or platform 1 of the motor truck A and preferably about the width thereof. This roller, in my invention, performs the very essential feature of permitting of the shifting or adjusting of the load from right to left in accordance with the direction the vehicle is moving and it is the function of the same to do this with relatively little friction.

A modified and preferred form of means for supporting and shifting or adjusting the load on the motor vehicle with as little friction as possible is shown in Figs. 1, 2, 9, 10 and 11, in which 39 represents a curved grooved run-way secured to the bed or platform in any preferred manner and having a radius preferably equal to the distance from a point in front of and above the traction wheels T to a point slightly in front of the rotary bolster 4 of the trailer B.

40 represents a series of ball bearings adapted to run in said run-way and 41 a relatively thin spacing device for maintaining them at a constant distance from each other, 42, 42 (see Fig. 9) being two slots in the opposite ends of said spacer, and 43, 43 bolts for holding it in relatively loose position with relation to the ball bearings, the object of this part of the device being to afford relatively little friction to the lateral shifting of the load and move with the ball bearings and keep them properly spaced.

44 (see Fig. 10) represents a floor which is designed to be located under the front of the load and upon the ball bearings 40. When the vehicle is used for transporting bales, barrels, or other heavy goods in bulk the king bolt 9 (Fig. 5) is preferably extended through the rear end of this floor, so that it will move with the load and have sufficient friction to hold the rear end of the load from moving. When transporting lumber or heavy timbers of squared form affording a flat surface on the under side this floor need not be used, as illustrated in Fig. 1.

45, 45 are two flat strengthening bars running lengthwise and underneath the two central longitudinal bars 11, 11, and designed to greatly strengthen the structure, being connected to the lower part of the turn table 20 and to the four braces 8, as shown in Figs. 1, 3 and 5.

Referring now to Figs. 13 and 14 I will

describe a modified form of means for effecting the angular adjustment of the trailer and its wheels in which the upper part of the turn table is provided with a groove 46 extending entirely around the outer surface thereof, thus making it in effect a bull-wheel, and 47 is a wire cable or chain, 48 being a turn buckle for connecting the same to a pulley 49 journaled in the rear end of the frame of the chassis upon a cross bar 50.

51, 51, 51, 51 are four friction pulleys, two journaled in the rear end of the chassis frame and two in the front end of the trailer frame, the function of these several pulleys, together with the bull wheel, being to effect the adjustment of the upper part of the turn table and hence the angular adjustment of the load with as little friction as possible, as will be described in connection with the description of the mode of operation.

I will now describe the mode of operation of my improved apparatus by first referring to Figs. 1, 2, 9, 10 and 11, in which there is shown in Figs. 1 and 9, a plurality of relatively heavy squared timbers upon the vehicle, constituting the load L, and ready for transportation. It will be noticed that these timbers are stacked upon the vehicle and that they rest at an angle with the major portion of their weight upon the bolster 4 and the bed or platform of the trailer, which bed or platform is in reality only a bolster with an extended area for affording greater friction to the load than would be afforded by the relatively narrow bolster shown in Figs. 5 and 13. It will be noticed that, as above stated, this bed or platform is so located that the mean of the entire bearing surface is located preferably about one inch to the front of the bolster for maintaining the center of gravity of the load always in front of the axle of the wheels W, as shown in Figs. 2 and 13, and that the anti-friction device shown in Figs. 8, 9, 10 and 11 is located a definite distance in front of a vertical line drawn through the axes of the traction wheels T. I have found this distance to be preferably about two feet, three and a half inches. The load is preferably stacked upon the vehicle so that there is from one to two inches space on each side between the same and the rungs 36 of both the motor vehicle and the trailer, this for the purpose of affording freedom of movement in the adjustment thereof. Suppose that the load to be carried is composed of 24 ft. timbers, I preferably adjust the reach 3 by placing the bolt 28 in the rear hole 27 of the first three holes and then connecting the upper ends of the chains 32 to the hooks 33, for the purpose of liberating, for the angular adjustment of the wheels, the upper part of the turn table 5. The chains, there-

fore, are now out of use. The adjustment of the screws 25 having been made for giving the proper angle the load is ready to be proceeded with. In this position, when the motor vehicle is started on a direct line the pull is exerted by the action of the traction wheels T and the major portion of the load is carried by the wheels W of the trailer B. Under this condition the broad treads of the trailer offer the least resistance to the power and will continue to move in a straight line so long as the motor is driven in a straight line. Suppose now that the chauffeur turns the steering wheels S to the right; the instant that the front of the vehicle begins to turn, the wheels W of the trailer are caused, by the broad bearing surfaces of their tires, to move to the left and advance a like distance, because of the fact that the play between the pivoted parts thereof and the trailer will permit the wheels of the latter to move in either direction a definite distance with absolute freedom, dependent upon the adjustment and movement of the steering wheels. When the vehicle has traveled a definite distance the rear end of the load is carried to the left practically the same distance that the front end was carried to the right. Consequently, the friction of the load upon the bed, bolster or platform 2 will cause the front end of the same to assume a direction which corresponds to the direction of the application of the propelling power so that the action of the traction motor upon the load is in a direct line through its center of gravity, the center of gravity always shifting in this manner in accordance with the angular movement of the wheels of the trailer, thus always effecting a successive adjustment so that one obtains a direct power action, and this action, whether the same be upon level ground or upon grades, will always give a minimum application of power because the traction wheels are under the load and the adjustment is effected in the manner described.

I have ascertained that with a vehicle as thus equipped it is possible to turn with extremely long loads in a circle having a radius of less than 40 ft., something which cannot be accomplished, so far as I am aware, with any known long vehicle; as, for instance with hook and ladder wagons where this act of turning a curve with small radius has been accomplished heretofore by a steering wheel and steersman. When it is required to carry relatively long loads of lumber I effect the adjustment of the vehicle by providing reaches of different length; a 4 ft. reach being used for 24 ft. timbers; a 7 ft. reach for 30 ft. timbers; a 10 ft. reach for 40 ft. timbers, and a 15 ft. reach for timbers 50 ft. and upward. I have ascertained also that with a vehicle as

thus equipped it is possible to carry either long or short loads of lumber or timbers, particularly the latter, without fastening the same to the vehicle in any manner, the material transported being simply stacked in the manner described upon the two vehicles with the major portion of the load upon the rear. Short timbers may be thus carried by overlapping the same so as to make relatively long loads; or short and long timbers may be carried together if desired by overlapping the short timbers on top of the long timbers. When the vehicle as described is properly equipped and proportioned for the service it is designed to accomplish, the points upon which stress is put utilize all the power and none of the applied force of the engine is wasted in useless strain, as there is absolutely no twisting or contortional effects and, therefore, all of the power is used in pulling the load. I have found that this constitutes an important feature of my invention on grades, as the same permits the movement of the vehicle up such grades with the use of a minimum amount of power because the wheels of the trailer which carry the load, by reason of their action, travel a minimum distance and, therefore, absorb a minimum portion of the power used.

After the vehicle is unloaded (see Fig. 3) the chains 32 are placed in their extended position on the hooks 33 so as to connect the movable part of the turn table from the stationary part. When it is desired to move the vehicle from place to place without load it is only necessary to remove the bolt 28 from the rear cross bar 29 and reach 3 and move the latter forward until the right-hand hole 27 is in position for again inserting the bolt 28. This brings the trailer forward and causes the ends of the two outer longitudinal bars 11, 11 of the trailer frame to come into contact with the ends of the chassis frame 30; it also causes the free end of the reach to enter the opening in the second cross bar 29 thus making it impossible for any person to enter between the trailer and the motor vehicle and ride upon the reach, thereby avoiding any possibility of an accident in this direction.

With the modified form of the angular adjusting appliance for the wheels of the trailer shown in Fig. 13 the chain, cable, or rope 47 connects the trailer to the chassis of the vehicle pivotally and there is no other connection whatever between the two, the load itself acting upon the bed or platform 2 and the journal bearings 38 or the roller 37 having sufficient friction to effect the adjustment of the facial bearing of the treads of the wheels W; these wheels having preferably a large tread surface. When the steel wheels W move to the left the drawing action from the motor vehicle upon the sur-

faces thereof, and the weight of the load, give sufficient friction to maintain them in any position which the steering wheels may place them, the chains 32 and reach 3 (see Fig. 2) not being absolutely required in this form of the adjusting apparatus. This action will be apparent when it is understood that the tread of the wheels W, W, will assume a direction of rotation either to the right or the left, dependent upon the direction of rotation of the steering wheels, and that the bolster 2 (Fig. 12) will always be at right angles to the direction of movement, and the chain or cord 47 will permit of this movement at all times. To illustrate, as seen in the drawings, Fig. 12, the vehicle is moving in a straight line from right to left and if the steering wheels, not seen, be turned so as to travel at right angles to this straight line the bolster 2 will assume a position at right angles to its present position and all intermediate angles will depend upon the angular movement of the steering wheels, it being obvious that the tread faces of the wheels will assume these positions for different positions of said steering wheels. When the form of roller 37 under the front end of the load is used said roller preferably has about two inches play at each end for affording the necessary adjustment. It may also be covered with some good lubricating oil so as to afford the necessary movement of the load both laterally and longitudinally in adjusting itself.

The motor vehicle A is shown in the drawings as of relatively great length, such as is used in transporting lumber, and having the motor located over the steering wheels S at the extreme front end thereof, the point of application of power being in the sprocket wheels under the head as shown and just ahead of the traction wheels T, this being necessitated in long loads; but, it will be understood that where a vehicle is designed for conveying bulk freight, such as boxes, barrels, bales, etc., or even for conveying passengers in vehicles of the stage-coach type the entire propelling motor may be located farther back and in such vehicles furnish the major portion of the weight sufficient to give the necessary traction to the traction wheels, the location of the motor being one which the designer of the vehicle will naturally fix upon in accordance with the work to be done.

I do not limit my invention to its use in the manner shown with motor vehicles of the explosive type, as obviously the application of the principles hereinbefore described may be used generally in the arts where it is desired to transport loads. As, for instance, in railways propelled by steam or electricity, or on inclined surfaces in transporting coal, or elevating logs to saw-mills, or like uses,

where the possibility of shifting the center of gravity forward of the axle of the trailer is obvious; or, in the movement of vehicles by electricity on highways without rails, either by storage batteries or by trolley, all such uses coming within the terms of my claims hereinafter. In its use in railways, however, the load could be practically all put upon the trailer in the nature of a single pair of wheels joined by an axle to two car wheels having the necessary strength to convey it and being so distributed that practically all of said load rests upon the trailer, only sufficient load resting upon a single truck to hold the same firmly in contact with the rails. Obviously, such a car or vehicle could be combined with various propelling motors connected together as a train, so that two, three, four, or more motors might transport a series of loads thus supported, either upon rails or on a highway in such manner as to give the greatest economy of power.

A modification of my invention coming within the generic terms thereof would be a vehicle having two traction wheels T and a single steering wheel located at the proper distance in front of the middle of the traction axle; together with a trailer consisting of a metallic cylinder of the proper diameter having a tread of a width substantially equal to the tread of the two wheels W, the mechanism for supporting the load being located at the desired point in the triangle formed by the frame work supported by the traction wheels and single steering wheel. Or, the steering wheels S and wheels W of the trailer might be supplanted by two pairs of sleigh runners provided with hubs and the latter equipped with the adjusting appliances described. Such an apparatus might be used in transporting lumber or logs in the lumber region, or other heavy articles of commerce which might be supported in the manner described, my invention having a generic use and these illustrations warranting me in the application of the principles described for the transportation of articles of commerce.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is—

1. The described method of loading and transporting heavy loads upon wheeled vehicles having a plurality of wheels, consisting in locating the center of gravity of the load in front of the rear axle and at a point dependent upon the grade to be traversed, and applying the power under the load and at such point in front of the center of gravity thereof as will offer the least resistance thereto; and also causing the applied power to automatically shift the load for all changes of direction so that its axis assumes a direction of movement in the plane of the direction of the applied power.

2. A motor vehicle embracing a plurality of wheels and a source of propelling power carried thereby; in combination with a trailer embracing one or more wheels and rotatable means carried thereby for supporting the major portion of the load; together with lateral shifting means carried by the vehicle for supporting the minor portion of the load, the arrangement being such that the load automatically shifts itself to correspond with the direction of motion of the vehicle, substantially as described.

3. A motor vehicle having a plurality of wheels; a trailer, the wheels of which are adapted to assume an angular position in either direction to correspond with the angular position of the steering wheel or wheels, said trailer having a bolster adapted to support the major portion of the load at a point in front of its axle; in combination with means carried by the vehicle for supporting the minor portion of the load and at a point in front of the axle of the traction wheels; a source of power also carried by the vehicle and applied to the traction wheels at a point beneath the load and means for shifting the same laterally, substantially as described.

4. A motor vehicle having a plurality of wheels, part of which carry a major portion of the load, while the traction wheels carry the minor portion thereof; together with means for regulating the distance between said wheels in accordance with the length of the load, substantially as described.

5. A motor vehicle having a plurality of wheels, part of which carry a major portion of the load, while the traction wheels carry the minor portion thereof; together with means for regulating the distance between said wheels in accordance with the length of the load; and means located in front of the traction wheels for permitting the load to shift in accordance with the angular direction in which it may at any time be moving, substantially as described.

6. A motor vehicle provided with traction wheels having flexible tires, together with a trailer adapted to carry the major portion of the load, and provided with steel tires of relatively broad tread, in combination with shifting means located transverse the bed or platform and above and in front of the traction wheels for carrying the minor portion of the load laterally in either direction, substantially as described.

7. A trailer for a truck having a bolster and the fixed part of a turn table secured thereto; in combination with the movable part of a turn table adapted to rotate upon said fixed part and supporting frictional means designed to carry the maximum part of a load; together with means for connecting said bolster to the rear end of another vehicle, and means for temporarily connect-

ing the movable part of the turn table to the fixed part thereof, substantially as described.

8. A motor vehicle having two traction wheels, a bed or platform, and the necessary appliances for steering; in combination with a trailer carrying a bed or platform adapted to support frictionally the major portion of the load; together with anti-friction means on the motor vehicle adapted to carry the minor portion of the load, substantially as described.

9. A motor vehicle having traction wheels at its rear end and a trailer provided with a bed or platform adapted to carry the major portion of the load, said bed or platform being carried by the movable part of a turn table; together with anti-friction means on the vehicle adapted to carry the minor portion of the load, and an adjustable reach for connecting the trailer to the motor vehicle, substantially as described.

10. A motor vehicle having a plurality of wheels, two of which are traction wheels; a wheeled trailer adapted to carry the major portion of the load; shifting means in front of and above the traction wheels for carry-

ing the minor portion of the load laterally in opposite directions, and a motor in front of the load connected with means for applying the motive power to the traction wheels at a point below the load, substantially as described.

11. A motor vehicle having a plurality of wheels, two of which are traction wheels; in combination with a wheeled trailer adapted to carry the major portion of the load, and ball bearings located transverse the load and in front of and above the axle of the traction wheels for carrying the minor portion of the load; together with a motor carried by the vehicle having connections for applying the power developed by the motor to the traction wheels located at a point below the front end of the load, substantially as described.

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

WILLIAM E. PAINE.

Witnesses:

C. J. KINTNER,
M. F. KEATING.

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

Correction in Letters Patent No. 1,025,714.

It is hereby certified that in Letters Patent No. 1,025,714, granted May 7, 1912, upon the application of William E. Paine, of New York, N. Y., for an improvement in the "Art of Traction-Vehicles," an error appears in the printed specification requiring correction as follows: Page 5, line 107, for the word "head" read *load*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of June, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

ing the movable part of the turn table to the fixed part thereof, substantially as described.

8. A motor vehicle having two traction wheels, a bed or platform, and the necessary appliances for steering; in combination with a trailer carrying a bed or platform adapted to support frictionally the major portion of the load; together with anti-friction means on the motor vehicle adapted to carry the minor portion of the load, substantially as described.

9. A motor vehicle having traction wheels at its rear end and a trailer provided with a bed or platform adapted to carry the major portion of the load, said bed or platform being carried by the movable part of a turn table; together with anti-friction means on the vehicle adapted to carry the minor portion of the load, and an adjustable reach for connecting the trailer to the motor vehicle, substantially as described.

10. A motor vehicle having a plurality of wheels, two of which are traction wheels; a wheeled trailer adapted to carry the major portion of the load; shifting means in front of and above the traction wheels for carry-

ing the minor portion of the load laterally in opposite directions, and a motor in front of the load connected with means for applying the motive power to the traction wheels at a point below the load, substantially as described.

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