No. 609,788. Patented Aug. 30, 1898.

G. J. CAPEWELL.

RAILWAY CAR TRUCK.

(Application filed Jan. 14, 1898.)

(No Model.) 3 Sheets—Sheet 1.

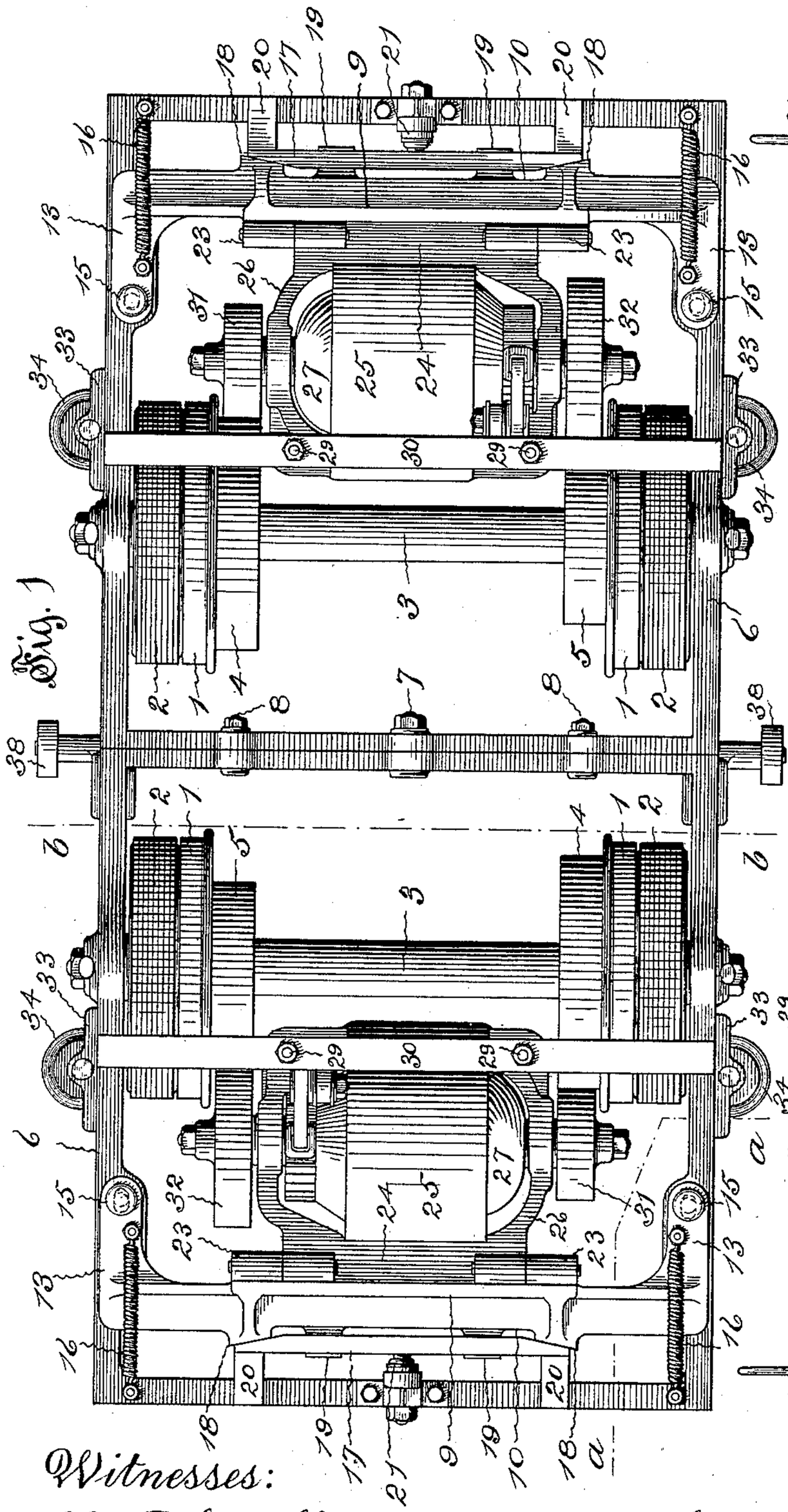

Fig. 1

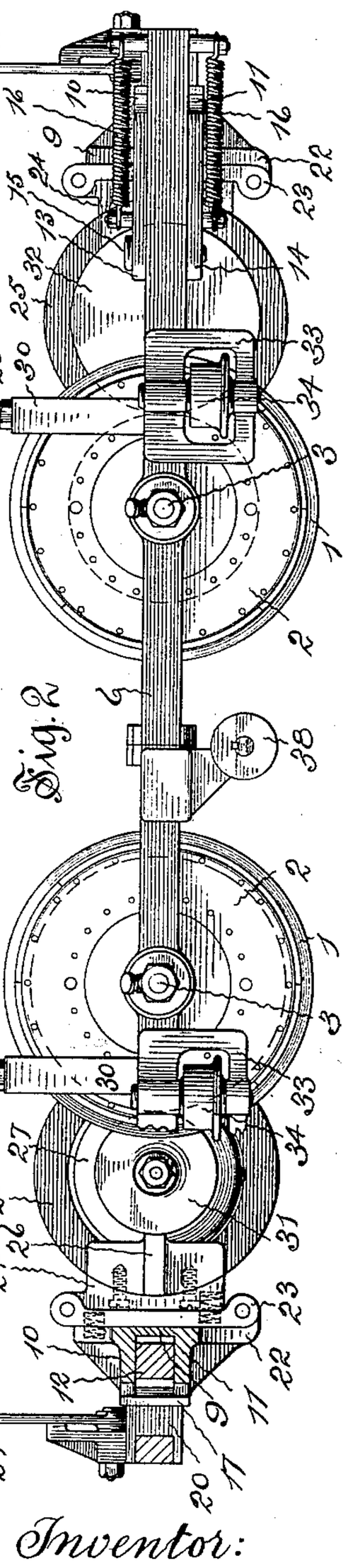

Fig. 2

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Fig. 3

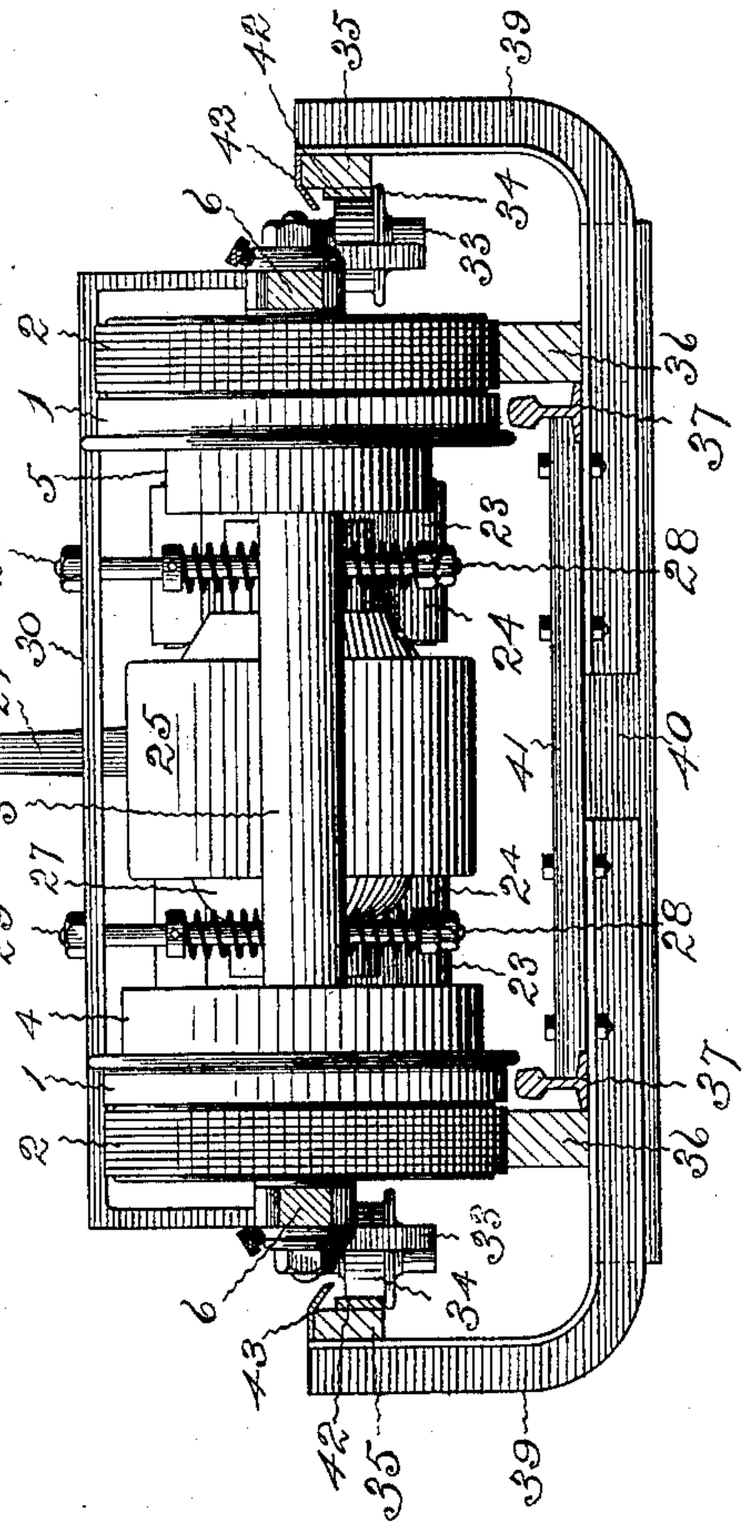

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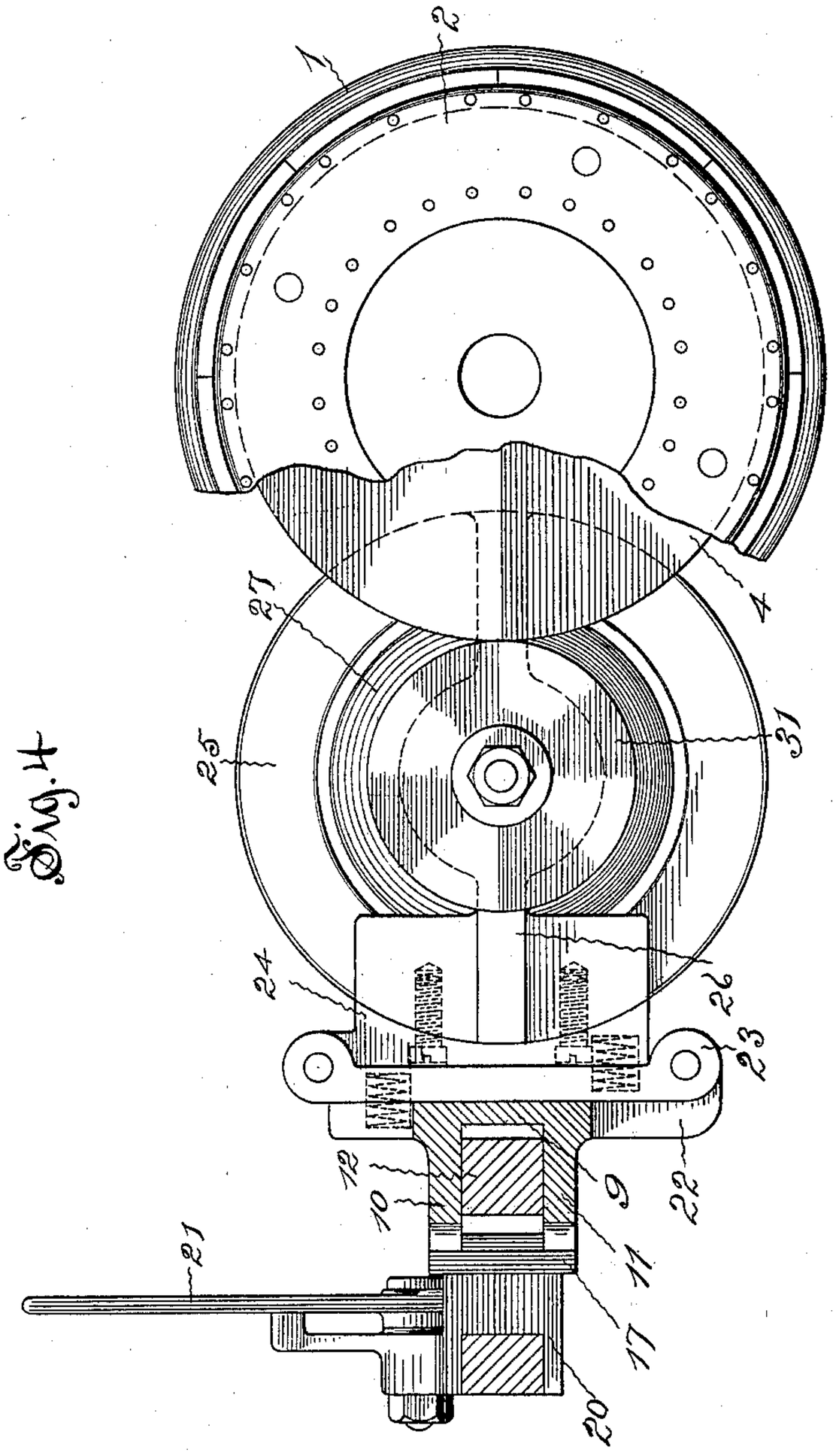
Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE J. CAPEWELL, OF HARTFORD, CONNECTICUT.

RAILWAY-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 609,788, dated August 30, 1898.

Application filed January 14, 1898. Serial No. 666,669. (No model.)

To all whom it may concern:

Be it known that I, GEORGE J. CAPEWELL, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Railway-Car Trucks, of which the following is a specification.

This invention relates to those trucks which are built for railway-vehicles designed to travel at high rates of speed.

The object of the invention is to provide a simple, durable, and easy-running truck having traction-wheels which will travel on the two rails of the track in common use or on the rails of a special noiseless track and pass from one to the other when running without jar, with one or more electric motors so arranged that through the medium of powerful gripping friction-pulleys the traction-wheels may be driven at different speeds in order that the motive power may be utilized to the best advantage, according to the grades of the road, the speed it is desired to travel, and the nature of the track which is being used.

In the embodiment of the invention illustrated by the accompanying views there are two axles, connected to each of which are a pair of ordinary flanged traction-wheels for running on the rails in common use, a pair of wide flat-tread traction-wheels that may be run on the rails of a special track, and a pair of friction-pulleys of different diameter. The axles are provided with suitable antifriction-bearings, and upon these the truck-frame is supported. The truck-frame is provided with side retaining-wheels that are employed when the flat-tread traction-wheels are utilized, and movably mounted upon the truck-frame are electric motors, the armatures of which are provided with pulleys of different diameters that are adapted to be brought into frictional contact with the pulleys on the traction-wheel axles.

Of the views, Figure 1 is a plan of a truck built according to the invention. Fig. 2 is a side elevation of this truck with part of one end cut away on the plane indicated by the dotted line *a a* of Fig. 1 to better illustrate the construction. Fig. 3 is a vertical section of the truck, taken on the plane indicated by the dotted line *b b* of Fig. 1, this view also showing a section of the tracks that may be employed with this truck; and Fig. 4 is a detail view, on a larger scale, illustrating the mechanisms employed for driving the traction-wheels.

The traction-wheels 1 have the ordinary inner flanges and are located at the usual distances apart for running on the common rails of the present track, and the traction-wheels 2 have wide flat treads without flanges, adapted to run upon the rails of a special track. The latter wheels are located outside of the former, but are connected with the same axles 3, so that the gage of the special track is wider than that of the regular track. The flat treads of the wheels 2 are preferably made of a comparatively soft material which will cushion and run noiselessly on the rails provided for them. In the views these wheels are shown as formed of a number of thin sections of wood securely riveted together between metal plates, and these plates and wooden sections are bolted to the ordinary flanged wheels. Inside of the wheels 1 and secured thereto or to the same axles are friction-pulleys, the pulleys 4 being larger in diameter than the pulleys 5.

The truck-frame 6 is supported by the axles of the traction-wheels, suitable bearings having common antifriction means and lubricating devices being provided to insure free rotation of the axles. The truck-frame shown is formed of two rectangular parts, which are held together at the middle by a pivot-bolt 7 and guiding-bolts 8, that extend through slots in the walls of one of the parts, so that these two parts of the truck-frame may have a slight vertical oscillation independently of each other in order that the wheels may readily conform to the contour of the rails upon which they run.

Supported by the truck-frame, near each end, is an adjustable motor-carriage 9. Each of these carriages is built with a plate 10 above and a plate 11 below a cross-bar 12 of the frame, and with arms 13, that extend from the upper plate, and arms 14, that extend from the lower plate along the top and bottom of the side bars of the truck-frame, so that each carriage, while held in place by these parts, may have a movement forward and backward. Bolts 15, passing through slots in the arms 13 and 14 and through the side bars of the truck-

frame, serve to limit the movement of these carriages. These carriages are normally drawn from the traction-wheels by springs 16 and are adapted to have either of their sides forced toward the traction-wheels by the wedge-bars 17, that engage inclined surfaces 18 on the edges of the upper and lower carriage-plates. These wedge-bars may be supported in position by projections 19 from the cross-bars 12, and they are backed up by blocks 20, secured to the end bars of the truck-frame. Connected with these wedge-bars are levers 21, which are pivoted to brackets attached to the end bars of the frame. When one of these levers is oscillated in a certain direction by hand or other means, the wedge-bar to which it is connected moves so as to force one side of a motor-carriage, with a motor, toward the traction-wheels, and when this lever is oscillated in the opposite direction the same wedge-bar forces the other side of the motor-carriage and motor toward the traction-wheels, the side of the carriage that is not forced forward being drawn back by the action of the springs connected with it.

Hinged to arms 22, depending from each motor-carriage, are arms 23, and hinged to the upper ends of these arms are bed-blocks 24, to which are secured the field-magnets 25 of the electric motors. Secured to the bed-blocks and connected with the field-magnets are the yokes 26, which are provided with bearings for supporting the shafts of the armatures 27. These yokes are yieldingly supported at the ends opposite the bed-blocks between springs 28, mounted on rods 29, depending from the elevated cross-bars 30. The motors mounted in this manner are free to rock both up and down on the double hinges, except as controlled by the springs 28.

Mounted upon the ends of the armature-shafts are friction-pulleys, the pulleys 31, that are arranged to engage with the pulleys 4 on the axles of the traction-wheels, being smaller in diameter than the pulleys 32, that are arranged to engage with the pulleys 5 on the axles of the traction-wheels. The oscillation of the proper lever in the necessary direction will move the desired side of the motor-carriage toward the traction-wheels, allowing the opposite side of the same motor-carriage to be drawn away from the traction-wheels, and of course the motor that is hinged to that carriage moves with it. As the pulleys on the same armature-shaft are of different diameters, varying amounts of torque may be transmitted to the traction-wheels from the armature-shafts by properly moving these levers so as to engage and disengage the necessary friction-pulleys on the armature-shafts with the corresponding pulleys on the traction-wheel axles. The action of the friction-pulleys mounted upon the armature-shafts supported in this manner and the pulleys mounted upon the axles of the traction-wheels is fully shown and described in my application for patent filed March 8, 1897, and serially numbered 626,390, and reference is made to that application for a fuller comprehension of this action, if such is desired.

Supported by bearings formed in brackets 33, attached to the side bars of the truck-frame, are two side retaining-wheels 34. These wheels are arranged to engage with side rails 35 for keeping the truck on the track when the wide-tread traction-wheels are running upon the rails 36 of the special track that is laid outside of the ordinary rails 37 of the track in common use. The truck-frame may also be provided with wheels 38, arranged to run beneath the side rails 35, if such is desired, to prevent the truck from jumping up when running at high speed. The rails 36 may be formed of wide flat timbers laid outside of and with their upper surfaces just a little higher than the rails 37, and the rails 35 may be formed of timbers bolted to the upper ends of bent T-irons 39. These T-irons may be passed under the ordinary rails between the common ties 40 and can be bolted to supplemental ties 41, secured between the ordinary rails. Metal plates 42 may be secured to the inner surfaces of the side rails 35 to form a track for the side retaining-wheels 34, and these plates may be employed as conductors of electricity when desired. Projecting shields 43 may be fastened to the top of the side rails 35 for protecting these contact-plates 42.

With this arrangement of power-transmitting mechanisms applied to a car the motors can be run continuously, if desired, and by movement of the wedges or of corresponding parts the friction-pulleys can be thrown in or out of contact, as desired. These pulleys will run comparatively noiselessly and will have sufficient frictional grip to properly transmit power from the armature-shafts to the axles of the traction-wheels, which frictional grip will be directly proportional to the load to be moved—that is, when the load is light the friction between the pulleys and on the bearings will be light, and when the load is heavy the friction between the pulleys and on the bearings will be increased. The changing of the frictional grip of the pulleys is automatic and will occur in such manner that the frictional grip of the pulleys will quickly adjust itself to the load to be carried. The levers are easily operated for throwing in and out of contact the pulleys on either side, so that different speeds may be obtained. The parts of the truck-frame are arranged so that they can oscillate vertically and allow the traction-wheels to accommodate themselves to the contour of the track. This will occur, and all roughnesses will be passed over smoothly and without jar or strain to the whole truck, whether the flanged wheels are running on the ordinary track or the wide flat-tread wheels are running on the special track.

With this truck a car can be run on the track in common use at the present time, and

when desired the car can be run off from such a track onto a special track having flat rails. This provision enables the use of wheels having comparatively soft rims or rims provided with cushions, which will permit the running of the truck very rapidly with but little jar and vibration and without noise. Such a truck is particularly advantageous on elevated structures in cities, and it is also useful where it is desired to run at very high rates of speed. The flat-tread wheels run with but little friction upon the track, and the side retaining-wheels run in contact with the side rails with but little friction, and they prevent the flat-tread wheels from running off the rails and also from jumping up from the rails. The side rails arranged in this manner provide substantial insulated supports for conductors carrying high-tension electric currents and for a protecting guard or fence for the track when electricity is employed. An electric road can be built in this manner with cushioned traction-wheels and with flat wide rails for running across country. Where it is undesirable to utilize the side guiding-rails, as at crossings or switches, the ordinary rails may be laid for short distances and the truck run from one form of rails to the other without stopping and without inconvenience to the passengers. The wide flat rails may be laid alongside a track having the common rails. When thus laid, the upper surfaces of the flat wide rails are a little above the common rails, so that a truck provided with the wheels herein shown and described will be lifted above the common rails when running upon the flat wide rails. When a truck is thus lifted, the flanged traction-wheels are not in contact with the common rails. The truck, when running on the special rails, may be drawn with less power than on the ordinary rails, for there are no flanges rubbing against the sides and causing friction, as when the flanged traction-wheels are being utilized.

I claim as my invention—

1. In a railway-car truck, in combination, flanged traction-wheels, friction-pulleys connected thereto, a truck-frame supported by the axles of the traction-wheels, a motor-carriage loosely mounted upon and movable longitudinally of the truck-frame, a motor supported by the carriage, pulleys mounted on the armature-shaft of the motor, springs normally holding the carriage with the pulleys out of contact, and mechanism for moving the carriage so that the pulleys on the armature-shaft will engage with the pulleys on the traction-wheel axle, substantially as specified.

2. In a railway-car truck, in combination, flanged traction-wheels, friction-pulleys of different diameters connected thereto, a truck-frame supported by the traction-wheels, a motor-carriage loosely mounted upon the truck-frame, means for moving either side of the motor-carriage, a motor supported by the carriage, and friction-pulleys of different diameters mounted upon the armature-shaft of the motor and adapted to be moved into and out of contact with the traction-wheel pulleys, substantially as specified.

3. In a railway-car truck, in combination, flanged traction-wheels, wide-tread traction-wheels connected thereto, a truck-frame supported by the traction-wheels, a motor-carriage loosely mounted upon the truck-frame, means for moving the carriage, a motor supported by the carriage, and friction connections between the motor and traction-wheels, substantially as specified.

4. In a railway-car truck, in combination, flanged traction-wheels, wide-tread traction-wheels and friction-pulleys mounted upon the same axles, a truck-frame supported by the traction-wheels, a motor-carriage loosely mounted upon the truck-frame, means for moving the motor-carriage toward and from the traction-wheels, a motor supported by the carriage, and friction-pulleys mounted upon the armature-shaft of the motor and adapted to be moved into and out of contact with the pulleys connected with the traction-wheels, substantially as specified.

5. In a railway-car truck, in combination, flanged traction-wheels, a truck-frame in two parts, each part being supported by a pair of traction-wheels, bolts for pivotally connecting the parts of the truck-frame whereby they may have an independent vertical oscillation, a motor-carriage loosely mounted upon and movable longitudinally of each truck-frame, means for moving the carriages, motors supported by the carriages, and friction connections between the motors and traction-wheels and adapted to be engaged and disengaged according to the movement of the carriages, substantially as specified.

6. In a railway-car truck, in combination, flanged traction-wheels, wide-tread traction-wheels connected thereto, a truck-frame supported by the traction-wheels, a motor-carriage adjustably mounted upon the truck-frame, means for moving the carriage, a motor supported by the carriage, friction connections between the motor and the traction-wheels, and retaining-wheels located at the sides of the truck-frame, substantially as specified.

7. In a railway-car truck, in combination, wide-tread flangeless traction-wheels, friction-pulleys connected thereto, a truck-frame supported by the traction-wheels, a motor-carriage loosely mounted upon the truck-frame, means for moving the motor-carriage toward and from the traction-wheels, a motor supported by the carriage, friction-pulleys mounted upon the ends of the armature-shaft of the motor and adapted to be moved into and out of contact with the pulleys connected with the traction-wheels, and retaining-wheels located at the sides of the truck-frame, substantially as specified.

8. In a railway-car truck, in combination, flanged traction-wheels, wide-tread traction-

wheels and friction-pulleys mounted upon the same axles, a truck-frame supported by the traction-wheels, a motor-carriage loosely mounted upon the truck-frame, means for moving the motor-carriage toward and from the traction-wheels, a motor, a double hinge connection between the motor and the motor-carriage, and friction-pulleys mounted upon the armature-shaft of the motor and adapted to be moved into and out of contact with the pulleys connected with the traction-wheels, substantially as specified.

9. In a railway-car truck, in combination, flanged traction-wheels, friction-pulleys of different diameters connected thereto, a truck-frame supported by the traction-wheels, a motor-carriage loosely mounted upon the truck-frame, means for moving either side of the motor-carriage, a motor, a double hinge connection between the motor and the motor-carriage, a wedge-bar adapted to move either side of the motor-carriage, a lever arranged to reciprocate the wedge-bar, and friction-pulleys of different diameters mounted upon the armature-shaft of the motor and adapted to be moved into and out of contact with the pulleys connected with the traction-wheels, substantially as specified.

10. In a railway-car truck, in combination, flanged traction-wheels, wide-tread traction-wheels connected thereto, a truck-frame formed in two parts, each part being supported by a pair of traction-wheels, pivot-bolts connecting the parts of the truck-frame so that they may have an independent vertical oscillation, and side-bearing retaining-wheels secured to the side bars of the truck-frame, substantially as specified.

11. In a railway-car truck, in combination, flanged traction-wheels adapted to run upon the two rails of the ordinary track, flat-tread traction-wheels without flanges mounted upon the same axles with the flanged traction-wheels and adapted to run upon special rails that are higher than and which extend alongside the rails of the ordinary track, a truck-frame supported by the traction-wheels, and retaining-wheels borne by the truck-frame and adapted to run against side rails elevated above the traction-rails when the truck is supported by the flat-tread traction-wheels upon the higher special rails, substantially as specified.

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