(No Model.) 2 Sheets—Sheet 1.

J. O. ADSIT & C. H. WICKHAM.

STREET CAR.

No. 492,882. Patented Mar. 7, 1893.

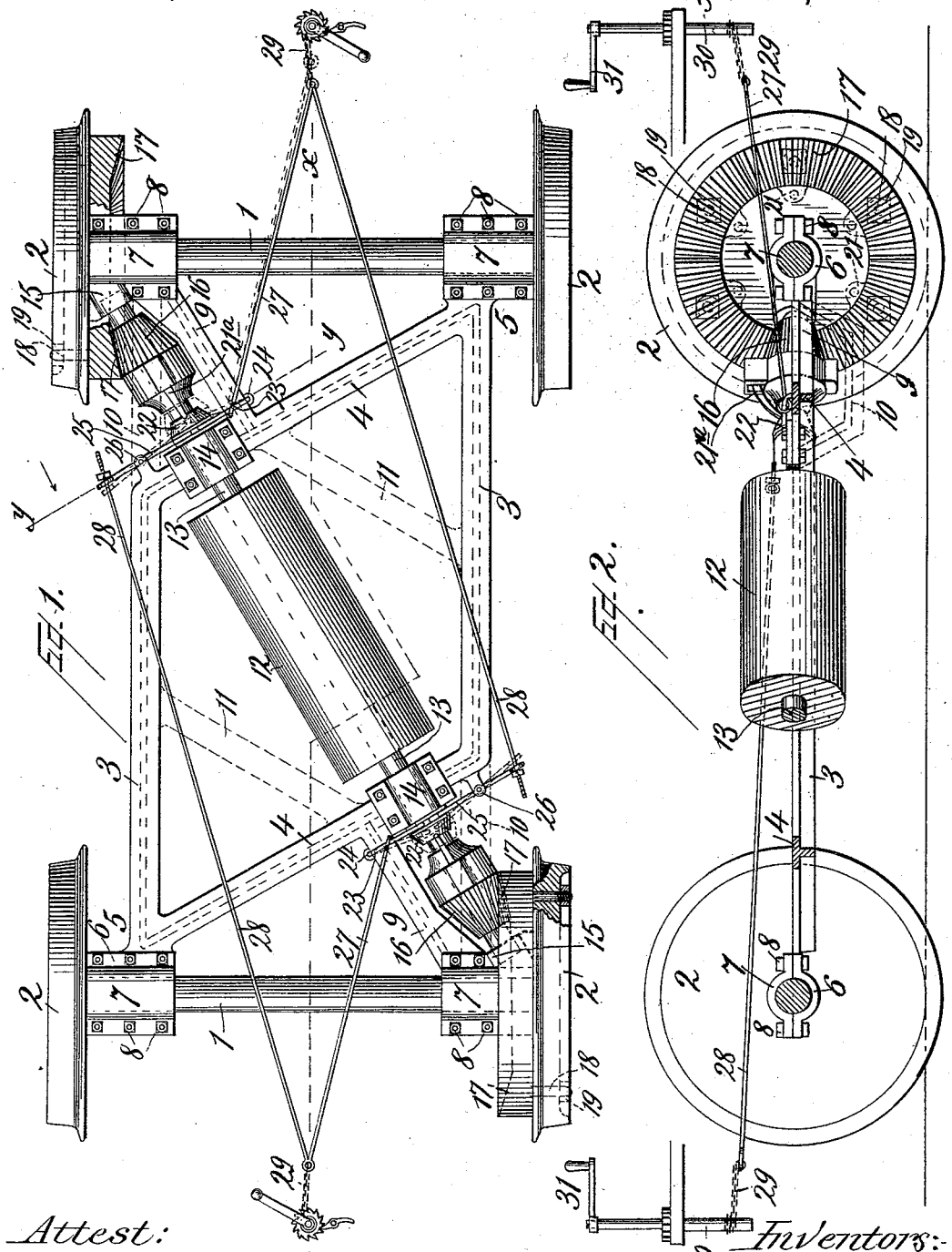

Fig. 1.

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

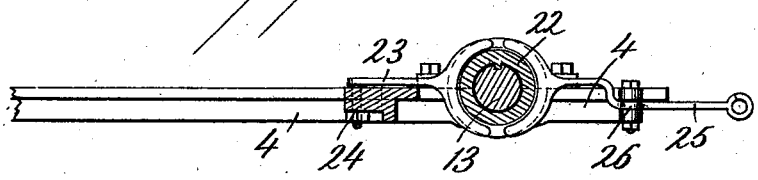


Fig. 4.

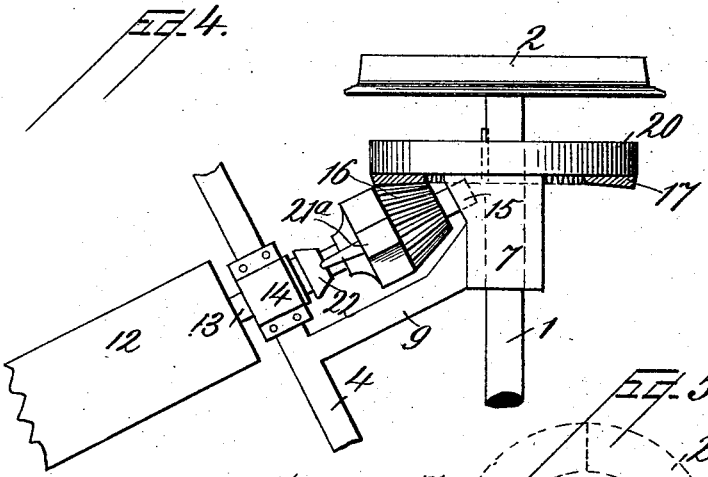


Fig. 5.

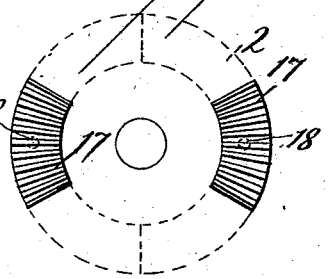


Fig. 6.

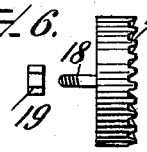
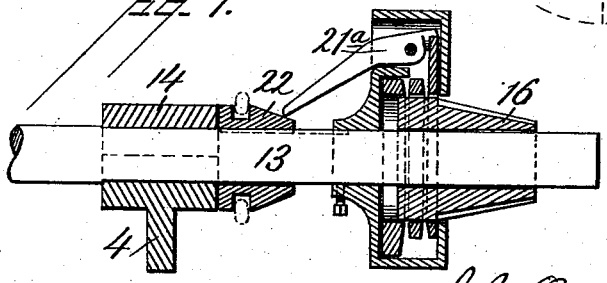


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN OLMSTED ADSIT, OF HORNELLSVILLE, NEW YORK, AND CHARLES HENRY WICKHAM, OF TIOGA, PENNSYLVANIA.

STREET-CAR.

SPECIFICATION forming part of Letters Patent No. 492,882, dated March 7, 1893.

Application filed May 14, 1892. Serial No. 433,014. (No model.)

To all whom it may concern:

Be it known that we, JOHN OLMSTED ADSIT, residing at Hornellsville, in the county of Steuben and State of New York, and CHARLES HENRY WICKHAM, residing at Tioga, in the county of Tioga and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Street-Railway Cars; and we do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention has reference to the construction of car trucks, more particularly to street railway cars which are electrically propelled, and has for its objects to provide for the rigid support of the shaft of an electric motor in the same horizontal plane with the car axles and arranged so as to extend diagonally between the two axles and have suitable toothed wheels on it engage with toothed wheels or gears connected with the car wheels or axles so as to apply power from the rigid shaft of the motor simultaneously to the front and rear car wheels or axles by a single reduction gear at diagonally opposite points, in the same horizontal plane with the front and rear axles; also to provide a rigid frame to connect the front and rear axles to afford a rigid support for the motor shaft which will extend diagonally across said frame, the frame being designed to give the maximum of strength and rigidity for the support of the diagonally disposed motor shaft; also to provide for such a construction of the frame as will permit it to be quickly applied and adjusted to position between the front and the rear axle; and also provide for throwing the gears of the motor shaft into and out of operation whereby the power of the motor may be gradually applied and the burning out of the wires of the motor prevented.

It also, has for its object to generally simplify and improve the construction and application of the parts employed.

By reason of the construction and the disposition of the parts just referred to in general terms and hereinafter more particularly specified the power is more directly and positively applied to the car wheels or axles, and constant contact between the power transmitting gears insured and loss of power prevented, and firmness and strength obtained.

To the accomplishment of the foregoing and such other advantages as may result from the improvements made, the invention consists in the construction and the disposition of parts hereinafter particularly described and then sought to be specifically defined by the claims, reference being had to the accompanying drawings forming a part hereof, and in which

Figure 1 represents a plan of so much of a car truck necessary to illustrate the invention, showing the rigid frame connecting the front and rear car wheel axles together, with the diagonally disposed motor shaft, the power transmitting gears, and means for throwing said gears into and out of operation. Fig. 2 is a side elevation, in vertical section on the line x—x of Fig. 1. Fig. 3 is a sectional view of parts taken on the line y—y of Fig. 1 looking in the direction of the arrow represented in Fig. 1. Fig. 4 is a plan view, with parts broken away, showing a modified form of applying the power transmitting gear. Fig. 5 is a side view of one of the power gears with sections of the gear teeth removed. Fig. 6 is an end view of one segment of the gear wheel, showing also the bolt and nut by which the same may be secured in place, and Fig. 7 is a side view of a portion of the motor shaft, sections of the supporting frame, the beveled pinion gear, and clutch mechanism.

In the drawings the numeral 1 designates the front and rear axles of the car provided with the wheels 2 of any approved pattern. The front and rear axles are connected together by a rigid frame preferably composed of the two parallel members 3 extending lengthwise of the truck and connected together by the members 4 extending diagonally to the length of the truck, the diagonally opposite corners 5 of the frame having formed integrally therewith the lower half 6 of the boxings of the axles, the upper portions of the boxings being formed by the caps 7 which will be secured by bolts 8 to the lower por-

tion of the boxing, whereby the frame will be secured at the points mentioned to the two axles of the car. The frame will also be connected to the axles by the similarly formed boxes 6 and 7 and bolts 8, the lower portions of the last mentioned boxes being formed integral with the members 9 extending from the members 4, or integrally with the members 10 extending from the members 3, or integrally with both of said members 9 and 10 if both members be employed together. If the members 10 be employed as a portion of the frame, it is preferred to have them drop down below the plane of the other portion of the frame and then be extended up to where the boxes are attached as indicated by dotted lines in Fig. 2 so as to clear the beveled pinions that are on the motor shaft. It is preferred to make the entire frame of T iron as illustrated, and if desired the frame may be braced by the members 11 formed integrally therewith or otherwise connected thereto.

The frame constructed as described constitutes a rigid connection between the front and rear axles and distributes the strain so that it does not come unduly upon any one point; and when constructed generally as described it can be made as an independent part of the structure and shipped in that form in condition for ready attachment at the point of destination. This frame also constitutes a rigid support for any suitable approved type or pattern of electric motor which the part numbered 12 will represent, the shaft 13 of the motor being journaled in suitable boxes therefor made in or upon said frame and held thereto by the caps 14 so as to be free to turn in its boxes. This motor shaft is extended diagonally across the frame and is supported so as to be in the same horizontal plane with the front and rear axles 1 of the car wheels, the ends of the shaft resting in suitable bearings 15 made therefor in the boxes which secure the frame to the front and rear axles. This shaft 13 supports suitable gears, for instance, the beveled pinions 16, the teeth of which will engage the teeth of another suitable gear, for instance, the gear 17 which may be secured to the car wheel as illustrated in Fig. 1, or to the car axle at a point removed from said car wheels as is indicated in Fig. 4 of the drawings. By supporting the motor shaft 13 diagonally upon the rigid frame between the front and rear axles so that it will lie diagonally to said axles and in the same horizontal plane therewith, the gears upon the motor shaft are caused to have constant contact with the other power transmitting gears at a point where they cannot leave the gears and where the power will be applied to the best advantage, and so that by a single reduction gear the power will be applied simultaneously from the single motor shaft to the front and rear wheels of the car, either directly as illustrated in Fig. 1, or indirectly through the car axle as indicated in Fig. 4 of the drawings, in both instances the power being applied at diagonally opposite points.

We prefer to form the gears 17 of a series of segments, each being formed with a bolt 18 which will pass through the car wheel and have a nut 19 applied thereto to clamp the segment to the wheel. But instead of that form we may have the segments of the gears 17 applied in the same manner to a disk or plate 20 which will be keyed to the car axle at a point back from the car wheel as illustrated in Fig. 4.

Instead of forming the bolts on the back of the segments constituting the gears and passing them through the body of the car wheels as just described, the car wheels, and the segments, one or both, may be formed with perforated ears or lugs 21 as indicated by dotted lines in Fig. 2, and bolts be passed through the ears and nuts applied to the bolts to secure the parts together. This however, is a mere mechanical change involving no invention and need not therefore be more fully illustrated or described.

In order that the operating gears may be thrown into and out of operation without stopping the rotation of the motor shaft, and in order to apply the power of the motor gradually in starting the car so as to avoid burning out the wires of the motor, we provide some suitable form of clutch mechanism which will permit the gears to be thrown into and out of operation without necessarily stopping the power motor. As one suitable form for the purpose we have illustrated the bevel pinions 16 as mounted loosely upon the motor shaft and have shown in connection therewith a clutch mechanism 21 which is similar or like in construction and operation to the clutch patented to Henry Bond October 12, 1886, No. 350,798 and which therefore need not be here more particularly described, we having merely substituted the beveled pinion for the pulley represented in that patent; but we do not mean to restrict ourselves to that form of clutch, it being merely illustrated and referred to here as one form of suitable clutch that may be used for the purpose.

To the sliding cone portion 22 of the clutch is loosely connected the fork end of a lever 23 pivoted at the point 24, and also the fork end of another lever 25 pivoted at the point 26, and to the lever 23 is connected the end of a rod 27, as in a lever of the third kind, and to the lever 25 is connected the end of a rod 28, as in a lever of the first kind, so that by pulling on either of the rods 27 and 28 from the end of the car where the operator will stand the sliding cone will be moved so as to operate the clutch to bind the pinion to the motor shaft and thus cause the power to be transmitted through the pinion and the gear with which it meshes to the car wheel.

The same arrangement of clutch and levers and operating rods are employed at both ends of the truck so that the parts can be operated

in the same manner from either end of the car, the two ends of the rods 27 and 28 being joined at the ends of the car to a chain 29 connected to an upright shaft 30 provided with a crank handle 31 and pawl and ratchet so that by turning the shaft the rods and levers will be operated as is obvious to any person skilled in mechanics. A spring (not illustrated) may be employed to return the sliding cone portion of the clutch to its unclutching position when the operating rods are released. A sliding connection, by eyes as illustrated in the drawings, or otherwise, is made between the rods 27 and 28 and the levers to which they connect so that the levers may move or slide on said rods without effect when one lever is being operated by its rod for reasons apparent to the mechanic. This particular form of operating levers and rods is given merely as an illustration of a suitable form of mechanism for operating the clutches but it is obvious that other forms may be employed without departing from the invention.

We have described with particularity the details of construction of the various parts of the device but we do not mean to confine ourselves to such details as it is obvious that many changes may be made therein without departing from the spirit of the invention.

Having described our invention and set forth its merits, what we claim is—

1. The combination with the frame connecting the two axles, of the electric-motor shaft extending diagonally across the frame, said shaft throughout its length being rigid and supported rigidly in the same horizontal plane with the car wheel axles and having gears meshing with gears through which motion is transmitted to the car wheel, substantially as and for the purposes described.

2. The combination with the car wheel axles, of the electric-motor shaft arranged diagonally to the car wheel axles said shaft throughout its length being rigid and supported rigidly in the same horizontal plane with the car-wheel axles, and gears on said shaft meshing with other gears through which motion is transmitted to the car wheels whereby power is applied from said motor shaft simultaneously to the front and rear wheels at diagonally opposite points through single reduction gears and said gears on the shaft are held by the rigid shaft at the same point against the gears with which they mesh, substantially as and for the purposes described.

3. The combination with the car wheel axles, of the frame connected rigidly with the car axles at diagonally opposite points, the electric motor supporting shaft extending diagonally across said frame and rigidly supported in the same horizontal plane with the car axles, and the gears carried by said shaft and meshing with other gears transmitting motion to the car wheels, substantially as and for the purposes described.

4. The combination with the car wheel axles, of the electric-motor carrying shaft extending diagonally to the length of the car wheel axles and supported rigidly in the same horizontal plane with said axles, and gears carried by said rigid shaft and meshing with other gears for transmitting motion to the car wheel, substantially as and for the purposes described.

5. The combination with the car axles, of the motor-shaft supported between the axles and lying diagonally to the length thereof, gears for transmitting motion from said shaft to the car wheels, and means for throwing said gears into and out of operation while permitting the motor shaft to revolve, substantially as and for the purposes described.

6. The combination with the car axles and wheels, of the motor shaft supported between the axles diagonally to the length thereof and provided with gears meshing directly with gears connected to the car wheel, substantially as and for the purposes described.

7. The combination with the car axles and the motor-shaft supported between the axles and provided with gears, of gears for the motor-shaft gears to mesh with to transmit motion to the car wheels, said gears being formed in sections to permit sections of the gears to be removed without removing the whole gear, substantially as and for the purposes described.

8. The axle connecting frame comprising the parallel sides two of which run diagonally to the others, and boxes connected to said frame for attaching the same to the car axles, substantially as and for the purposes described.

9. The axle connecting frame comprising the parallel sides two of which run diagonally to the others, arms or members extending laterally from said frame, and boxes connected to said frame and to said laterally extending members for attaching the frame to car axles, substantially as and for the purposes described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN OLMSTED ADSIT.
CHARLES HENRY WICKHAM.

Witnesses:
FRANK BARTZ,
D. J. DUNCAN.