

No. 798,227.

PATENTED AUG. 29, 1905.

N. W. STORER.  
ELECTRIC RAILWAY MOTOR.  
APPLICATION FILED AUG. 6, 1904.

2 SHEETS—SHEET 1.

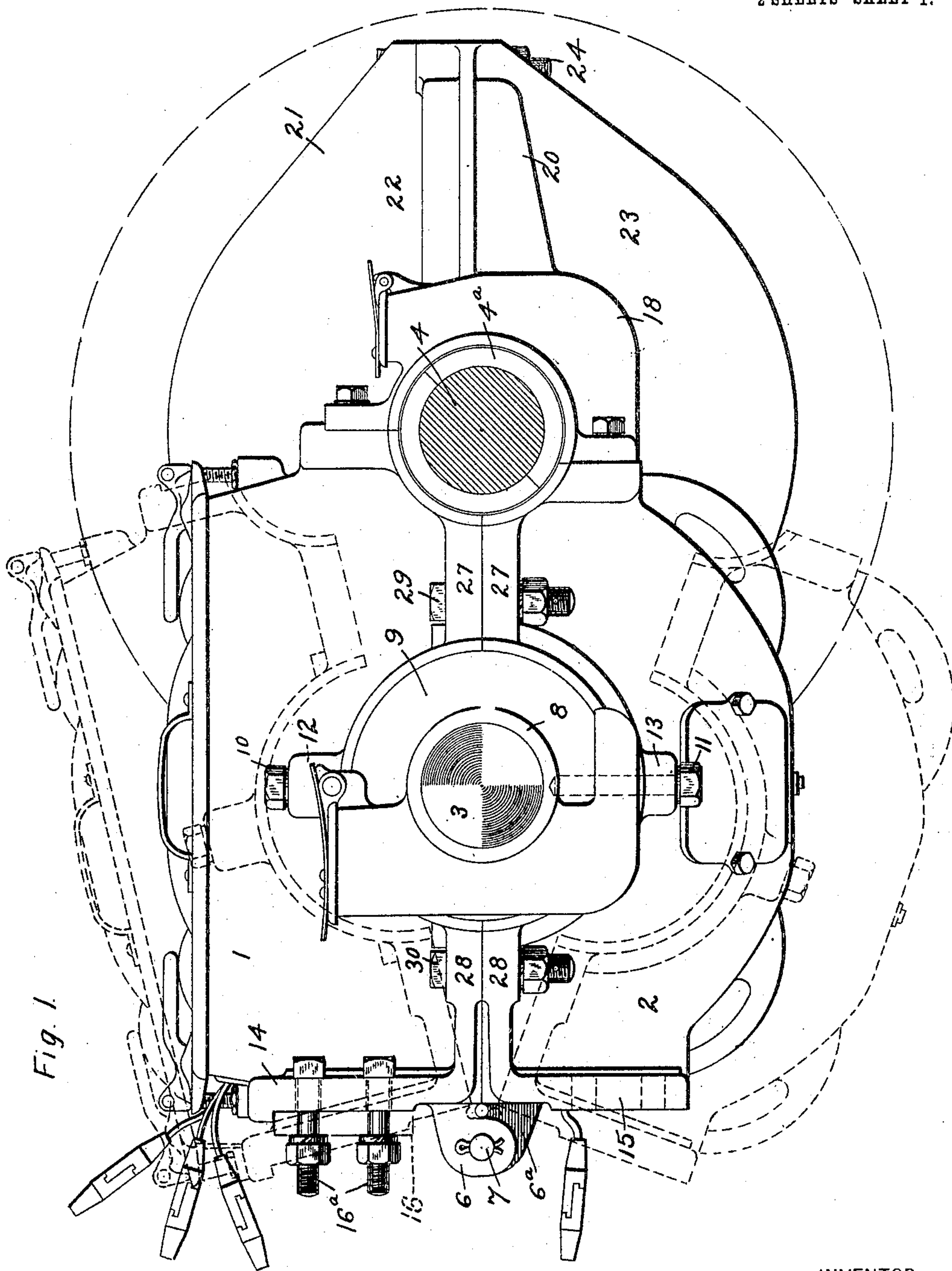


Fig. 1.

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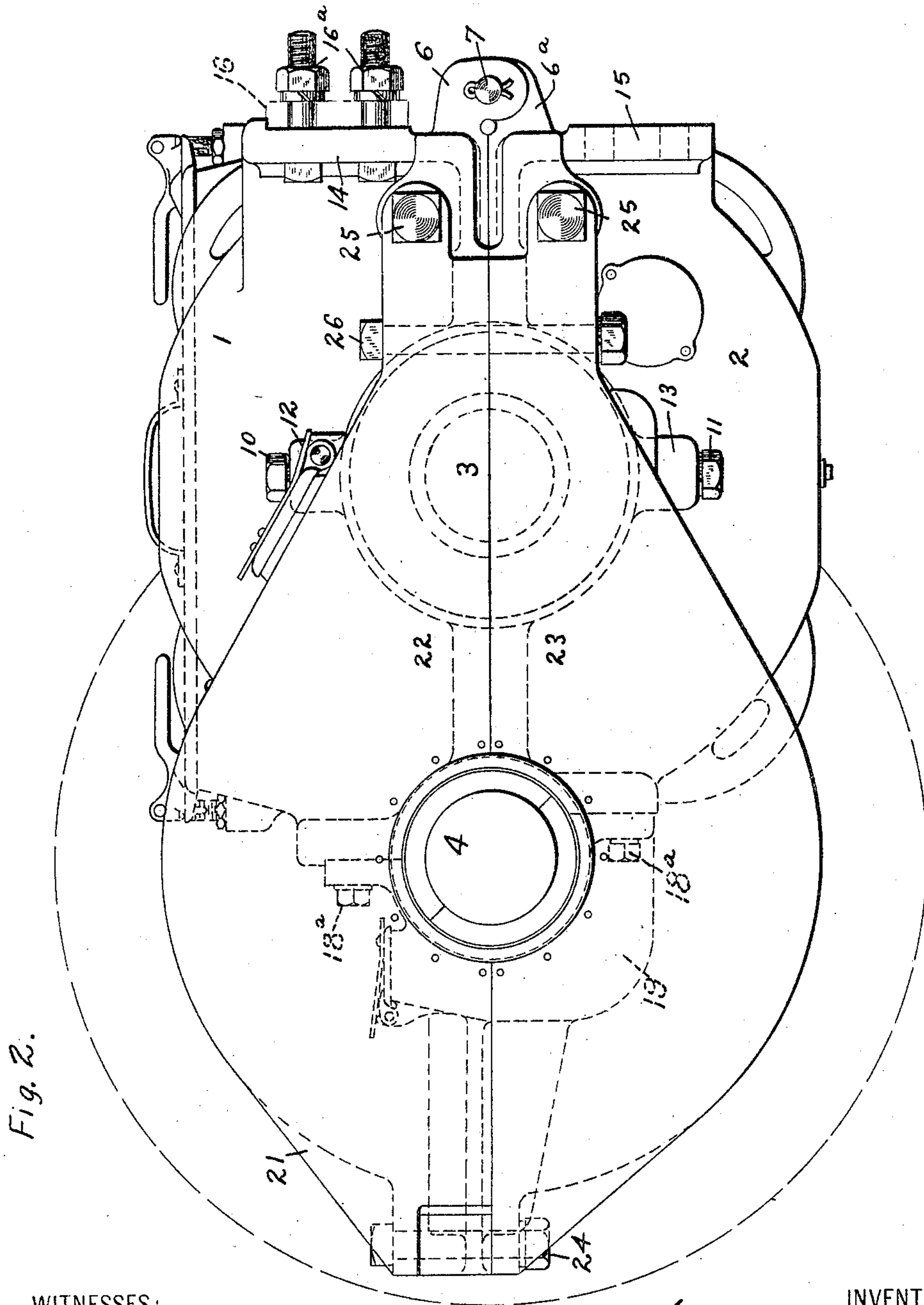
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC RAILWAY-MOTOR.

No. 798,227.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed August 6, 1904. Serial No. 219,790.

*To all whom it may concern:*

Be it known that I, NORMAN W. STORER, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Railway-Motors, of which the following is a specification.

My invention relates to electric railway-motors; and it has for its object to provide a motor which is of general application in railway-service in that it may be employed in the propulsion of vehicles which are provided with either single or double trucks and may be opened from either the top or the bottom without removal from the trucks and by the disturbance of a minimum number of parts.

Motors which have heretofore been used for the propulsion of double-truck cars have necessarily been of a somewhat different type of construction from those used in the propulsion of single-truck cars. In the repairing of the motors with which double-truck cars are equipped it has been a usual practice to remove the truck having the motor which is to be repaired and to substitute a similar truck therefor, the upper half of the motor being then opened in order to make internal repairs. Single-truck cars are ordinarily run over a pit in the floor of a car-barn, and the lower half of the field-magnet frame is dropped if it is necessary to make internal repairs.

Evidently it would be of material advantage to electric-railway companies that operate both single and double truck cars if motors of a standard type could be employed in connection with either type of car. I have therefore devised a motor which meets these conditions and will be now described.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view in end elevation of an electric railway-motor constructed in accordance with my invention, and Fig. 2 is a view in elevation of the opposite end of the motor shown in Fig. 1.

In accordance with the usual type of construction of electric railway-motors the motor comprises a field-magnet frame divided into two portions 1 and 2 in a plane through the axes of the armature-shaft 3 and the

driven axle 4, the two halves being hinged together at the side opposite the driven axle by means of suitable lugs 6 and 6<sup>a</sup> and a pintle 7.

The bearings 8 of the armature-shaft 3 are inclosed in and are supported by suitable housings 9, which may be of any of the well-known types of construction and which are secured in position by being seated in recesses in the two halves of the field-magnet frame. They are further secured in position by means of tap-bolts 10 and 11, that project through lugs 12 and 13, with which the upper and lower halves of the field-magnet frame are respectively provided.

If it is desired to support the armature in the upper half of the field-magnet frame when the lower half is dropped, so as to expose the interior of the motor, the bolts 11 are removed and the armature and its bearings are retained in the upper half of the field-magnet frame by means of the bolts 10. If it is desired to make repairs in the interior of the upper half of the field-magnet frame, the armature and its bearings may be lowered with the lower half of the field-magnet frame by removing the bolts 10, the bolts 11 serving to retain the armature and its bearings in the lower half of the frame.

The two halves of the field-magnet frame are respectively provided with suspension-lugs 14 and 15, the upper lugs 14 being adapted to be attached to a suspension-bar 16 by means of bolts 16<sup>a</sup> when the motor is utilized to propel a single-truck car or when it is mounted upon any truck which will permit of the lowering of the lower half of the field-magnet frame in order to make internal repairs to the motor. If the motor is utilized in connection with a double-truck car or is mounted upon any truck which permits of the opening of the upper half of the field-magnet frame for the purpose of making internal repairs to the motor, it is supported by means of the lugs 15, which are bolted to a suspension-bar.

At the opposite side of the motor the driven axle 4 is partially embedded in the field-magnet frame, and the axle-caps 18 and 19, which surround the remaining portion of the circumference of the driven axle near its ends, are fastened to the upper and the lower



halves of the frame by means of bolts 18<sup>a</sup>. The driven-axle bearings 4<sup>a</sup> are retained in position between the axle-cap and the motor-frame, and since the axle-caps surround  
 5 more than half the circumference of the driving-axle it is necessary that one-half of the bearings be inserted in position before applying the caps to the axle. These bearings are split at an angle with the vertical or  
 10 at an angle with the planes which separate the axle-caps from the field-magnet frame, as indicated in Fig. 1, in order that the axle may have sufficient bearing, and also in order that there may be no leakage of the lubricant at the point of division between the  
 15 halves of the axle-bearing.

It will be observed that each of the axle-caps 18 and 19 is bolted to the lower part of the field-magnet frame on a plane that is offset from a vertical plane through the axle-axis to such a degree that materially less than one-half of the corresponding axle-bearing is embedded in the field-magnet frame. This construction is provided in order that a comparatively small horizontal movement or a correspondingly small angular movement of the motor will serve to free it, so that it may be lifted bodily from the truck. It will be readily seen that if the  
 30 plane of separation between the axle-caps and the lower part of the motor-frame coincided with a vertical plane through the axle-axis, as does the plane of separation between the caps and the upper part of the frame, the motor could not be lifted from the truck without moving it horizontally a distance equal to the radius of the axle or tilting it substantially ninety degrees or combining the two movements.

40 The axle-cap 19 is provided with an extended bracket 20, which supports one end of a gear-case 21, the upper and lower halves 22 and 23 of which are respectively secured to the upper and lower sides of the end of the bracket 20 by means of a bolt 24. At the  
 45 other end of the gear-case the upper and lower halves 22 and 23 are respectively secured to the upper and lower halves 1 and 2 of the field-magnet frame by means of tap-bolts 25 and are clamped together by means of a bolt 26.

The meeting edges of the field-magnet frames are provided with flanges 27 at one side of the armature-shaft 3 and with similar  
 55 flanges 28 at the other side of said shaft, and the two parts of the frame are fastened together by means of these flanges and bolts 29 and 30.

If it is desired to expose the interior of the  
 60 motor by lowering the bottom half of the field-magnet frame, it is only necessary to remove bolts 29 and 30, either the bolt 10 or the bolt 11, the lower bolts 18<sup>a</sup>, and the lower bolt 25, the other parts of the motor  
 65 remaining undisturbed. If it is desired to

expose the interior of the motor by raising the upper half of the field-magnet frame, it is necessary to remove the bolts 29 and 30, the upper bolts 18<sup>a</sup>, either the bolt 10 or the bolt 11, and the upper bolt 25, the lower half of  
 70 the field-magnet frame being supported in position, since approximately two hundred and seventy degrees of the circumference of the driving-axle is surrounded by the lower half of the field-magnet frame and the axle-  
 75 caps.

Changes in the form, dimensions, and relative location of parts which do not materially affect the mode of operation or result may of course be made without departing  
 80 from my invention.

I claim as my invention—

1. An electric motor comprising a field-magnet frame having upper and lower halves which are hinged together at one side, and  
 85 axle-caps secured to both halves at the opposite side.

2. In an electric motor, the combination of a field-magnet frame in two parts which are hinged together at one side, means located at the same side for supporting the motor which may be secured to either the upper or lower part of the field-magnet frame, and axle-caps which are secured to both parts of the field-magnet frame at the opposite side.  
 95

3. An electric motor comprising a field-magnet frame in two halves which are pivoted together at one side, means at the same side for supporting the motor from either half of the field-magnet frame, and axle-caps  
 100 at the opposite side which are secured to both halves of the field-magnet frame but which may be released from either half independently of the other.

4. In an electric motor, the combination  
 105 of a field-magnet frame in two parts, hinged together at one side and each having suspension-lugs at that side, and axle-caps at the other side which are secured to both parts of the field-magnet frame.  
 110

5. The combination of an electric motor having a field-magnet frame in two parts which are hinged together at one side and each of which has suspension-lugs at that side, by means of which the motor may be  
 115 supported from either the upper or the lower part, an axle which is partially embedded in the two parts of the field-magnet frame, and axle-caps which surround the remainder of the axle and which are secured to both parts  
 120 of the field-magnet frame.

6. The combination of an electric motor, a driven axle and caps therefor, the said motor comprising a field-magnet frame divided into two parts in a plane through the centers of  
 125 the armature-shaft and the driven axle, and lugs integral with each part of the frame, by means of which the motor may be supported from either part, the said driven axle being partially embedded in both parts of the field-  
 130



magnet frame and the said caps being secured to both parts of the field-frame so as to surround the remaining portions of the axle.

7. An electric motor having a field-magnet frame comprising two parts hinged together at one side of the armature-shaft and severally provided with means for attaching the motor to a truck, of a bearing-housing for the armature-shaft, means for detachably fastening the same to the respective parts of the field-magnet frame, axle-bearings at the side opposite the hinges, axle-caps for said bearings and means for detachably fastening said caps to the respective parts of the field-magnet frame.

8. An electric motor comprising a field-magnet frame in two parts that are severally hinge-supported at one side, and axle-caps secured to both parts at the opposite side.

9. In an electric motor, the combination of a field-magnet frame in two parts, means for supporting the motor which may be secured to either the upper or lower part of the field-magnet frame at one side thereof, and axle-caps which are secured to both parts of the field-magnet frame at the opposite side.

10. An electric motor comprising a field-magnet frame in two parts which are severally hinged or pivoted at one side, means at the same side for supporting the motor from either half of the field-magnet frame, and axle-caps at the opposite side which are secured to both parts of the field-magnet frame but which may be released from either part independently of the other.

11. In an electric motor, the combination of a field-magnet frame in two parts that are severally hinge-supported at one side and each having suspension-lugs at that side, and axle-caps at the other side which are secured to both parts of the field-magnet frame.

12. The combination of an electric motor having a field-magnet frame in two parts which are severally hinge-supported at one side and each of which has suspension-lugs at that side, an axle which is partially embedded in the two parts of the field-magnet frame, and axle-caps which surround the remainder of the axle and which are secured to both parts of the field-magnet frame.

13. The combination with an electric motor, of an axle and caps therefor, the said motor comprising a two-part field-magnet frame each of which has lugs integral therewith by means of which the motor may be supported from either part, the said axle being partially embedded in both parts of the field-magnet frame and the said caps being secured to both parts of the said frame so as to surround the remaining portions of the axle.

14. An electric motor having a field-magnet frame comprising two parts that are mutually hinge-supported at one side of the armature-shaft and are severally provided

with means for detachably connecting that side of the motor to a truck, of a bearing-housing for the armature-shaft, means for detachably fastening the same to the respective parts of the field-magnet frame, axle-bearings at the side opposite the hinges, axle-caps for said bearings and means for detachably fastening said caps to the respective parts of the field-magnet frame.

15. An electric motor having a field-magnet frame horizontally divided into two parts, axle-bearings less than one-fourth of each of which is embedded in the lower part of the field-magnet frame and removable caps for said bearings.

16. An electric motor having a horizontally-divided field-magnet frame, axle-bearings partially embedded in the frame and axle-caps bolted to both parts of the frame, the joints between the caps and the lower part of the frame being offset from the axle-axis toward the motor.

17. An electric motor having a field-magnet frame in two parts and axle-bearings less than one-half of each of which is embedded in the field-magnet frame.

18. An electric motor having a field-magnet frame divided into two parts in a plane through the axes of the motor-armature and the axle, and bearings for the axle less than one-half of each of which is embedded in the field-magnet frame.

19. An electric motor having a field-magnet frame divided into two parts in a plane through the axes of the motor-armature and the axle, bearings for the axle less than one-half of each of which is embedded in the field-magnet frame, and caps for said bearings that are secured to both halves of the field-magnet frame but which may be released from either half independently of the other.

20. An electric motor having a field-magnet frame in two parts that are respectively pivoted and provided with supporting means at one side, axle-bearings therefor at the other side of the frame less than one-half of each of which is embedded therein, and caps for said bearings that are secured to both halves of the field-magnet frame but which may be released from either half independently of the other.

21. An electric motor having a field-magnet frame in two parts that are respectively pivoted and provided with supporting means at one side, and axle-bearings at the other side of the field-magnet frame less than one-half of each of which is embedded therein.

In testimony whereof I have hereunto subscribed my name this 30th day of July, 1904.

NORMAN W. STORER.

Witnesses:

FRED C. HANKER,  
BIRNEY HINES.