N. W. STORER.

LOCOMOTIVE.

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1,280,098.

Patented Sept. 24, 1918.

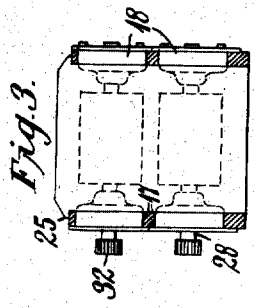

Fig. 3.

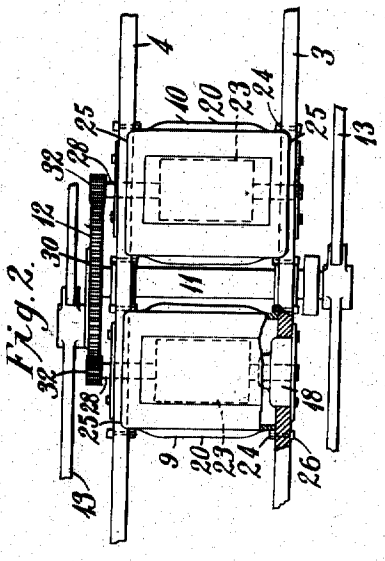

Fig. 2.

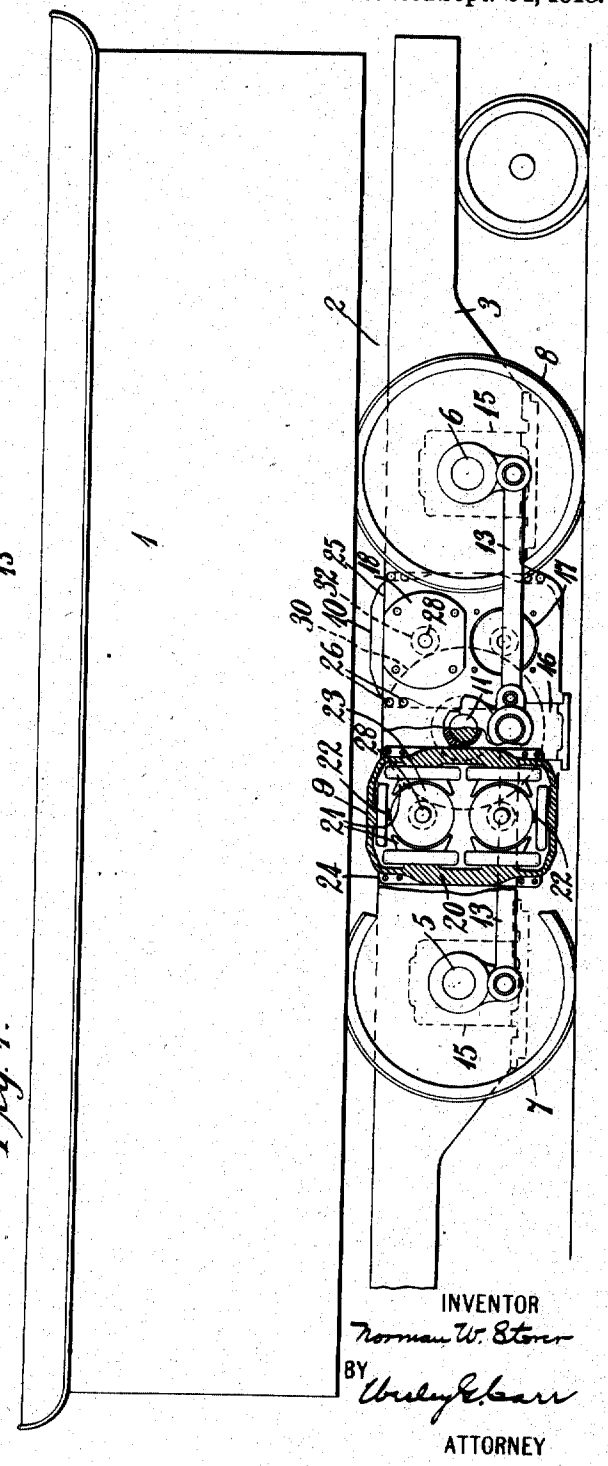

Fig. 1.

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LOCOMOTIVE.

1,280,098. Specification of Letters Patent. Patented Sept. 24, 1918.

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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 Locomotives, of which the following is a specification.

My invention relates to electric locomotives, with special reference to the running gear construction thereof.

One of the objects of my invention is to provide a powerful electric locomotive having a running gear that is simple, compact, strong and durable in construction, and which embodies a plurality of driving motors, the field magnet frames of which are rigidly secured between the locomotive side frames to constitute permanent cross-ties, and the armatures of which are carried in bearing housings which are detachably secured to the side frames.

In another aspect, the object of my invention is to provide a locomotive running gear embodying a plurality of twin motors assembled in side-by-side relation between the side frames in such manner that the several armatures are symmetrically disposed about an intermediate countershaft to which all of the armatures are mechanically connected.

In the accompanying drawing, Figure 1 is a view, partially in section and partially in elevation, of a locomotive constructed in accordance with my invention; Fig. 2 is a plan view, partially in section, of a portion of the running gear shown in Fig. 1; and Fig. 3 is a view, partially in section and partially in end elevation, of one of the driving units mounted in position upon the side frames.

Referring to the drawing, the locomotive shown comprises a cab 1 and a running gear 2 which embodies a plurality of side frames 3 and 4, driving axles 5 and 6, driving wheels 7 and 8, twin motors 9 and 10, a countershaft 11, gearing 12 and side rods 13.

The side frames 3 and 4 are of like construction, and each is provided with pedestal openings 15 to receive the driving axles 5 and 6, in the usual manner, a pedestal opening 16 for receiving the countershaft 11, and a plurality of openings 17 in which bearing housings 18 are disposed. The openings 17 are located symmetrically, in vertical pairs, on each side of the pedestal opening 16 and are of sufficient diameter to permit the removal of the motor armatures, as will be hereinafter set forth.

The driving units 9 and 10 are also of like construction, and each comprises a field magnet frame 20 having a plurality of main polar projections 21, and commutating polar projections 22, and a plurality of armatures 23 that are vertically disposed, one above the other, in magnetic relation to the main polar projections 21, in such manner that a single magnetic circuit serves in common for both armatures of the twin motor structure. Inasmuch as my present invention pertains only, in a general way, to the specific type of driving unit employed, I shall not attempt to describe the structure thereof in further detail.

The field magnet structure 20 extends the full width of the locomotive, intermediate the side frames 3 and 4, and its opposite ends are provided with side lugs 24 and substantially horizontal end projecting lugs 25. The field magnet structure 22 is supported upon its end projecting lugs 25, which rest upon the side frames 3 and 4, and is rigidly secured to said side frames by bolts 26 which coöperate with the side lugs 24. Thus, the field magnet structure 22 constitutes a permanent cross-tie of the locomotive frame and lends exceptional strength and rigidity thereto, while permitting of material economies in space.

The motor armatures 23 are carried upon shafts 28, which are journaled in the bearing housings 18, said bearing housings being disposed within the side frame openings 17 and detachably secured to the side frames 3 and 4 by bolts 19. The openings 17 are of sufficient diameter to permit the removal or overhauling of the motor armature 23 through the side frames, when desired.

The countershaft 11 is journaled in the pedestal opening 16 in a manner that is old and familiar to those skilled in the art, and one end thereof is provided with a gear 30 which meshes, in common, with a plurality of pinions 32 severally having rigid associations with the several armature shafts 28, whereby the driving effort of all of the armatures 23 is transmitted to the countershaft 11 and thence to the driving axles 5 and 6 through the side rods 13 and other

well-known linkage or driving connections, which it is deemed unnecessary to describe.

Obviously, many modifications may be effected in the structural details and arrangement and location of parts, without departing from the spirit and scope of my invention, and I desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. In a vehicle, the combination with a plurality of side frames, of a field-magnet structure located between said side frames, said field-magnet structure being removably supported on, and serving as a cross-tie between, the side frames, and an armature carried by said side frames and removable through one of said side frames.

2. In a vehicle, the combination with a plurality of side frames, of a field magnet structure interposed between said side frames and having integral lugs resting upon said side frames, means for rigidly securing said side frames to said structure, and an armature carried by said side frames and adapted to be longitudinally removed therethrough.

3. In a vehicle, the combination with a plurality of side frames having correspondingly located openings therein, of bearing housings disposed therein, an armature mounted in said bearing housings, a field-magnet frame surrounding said armature and extending the full width of said vehicle between the side frames, said field-magnet frame being removably mounted on, and serving as a cross-tie between, the side frames.

4. In a vehicle, the combination with a plurality of side frames, of a plurality of motor frames disposed between said side frames, said motor frames being removably mounted on, and serving as cross-ties between, said side frames, and a plurality of armatures mounted in each of said motor frames and individually removable through openings in the side frames.

5. In a vehicle, the combination with a plurality of side frames, of a plurality of electric driving units assembled side-by-side between said side frames, each unit comprising a single field-magnet frame and a pair of armatures disposed one above the other, a countershaft carried by said frames intermediate said driving units, and means for mechanically associating all of said armatures with said countershaft.

6. In a vehicle, the combination with a plurality of side frames, of a pair of twin motors supported in side-by-side relation by said side frames, each comprising a plurality of armatures disposed in vertical relation and a single field-magnet structure serving said armatures in common, a countershaft intermediate said twin motors, and gearing for mechanically associating said armatures with said countershaft.

7. In a vehicle, the combination with a pair of driving axles and a plurality of side frames supported thereon, of a pair of twin motors adjacently disposed between said axles and supported by said side frames, said twin motors being severally provided with field-magnet frames, a countershaft carried by said side frames between said pair of twin motors and, means for transmitting the driving effort of said twin motors to said countershaft and said driving axles.

8. In a vehicle, the combination with a plurality of side frames having correspondingly located openings therein, of a unitary field-magnet frame directly mounted on, and serving as a cross-tie for, the side frames, and a plurality of armatures mounted in said field-magnet frame, said armatures being adapted for a longitudinal removal through said side-frame openings.

9. In a vehicle, the combination with a plurality of side frames, one of which has relatively large openings therein, a field-magnet structure extending the full width of the vehicle between the side-frames, said field magnet structure mounted on, and serving as a cross-tie for, the side frames, of a plurality of armatures disposed within said field-magnet structure, and bearing housings removably positioned in said side-frame openings and adapted to support said armatures and to be secured to one of said side frames, the armatures being removable through the side-frame openings.

In testimony whereof I have hereunto subscribed my name this 21st day of May, 1914.

NORMAN W. STORER.

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