No. 801,602. PATENTED OCT. 10, 1905.

L. MOSS.

ELECTRIC LOCOMOTIVE.

APPLICATION FILED FEB. 2, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

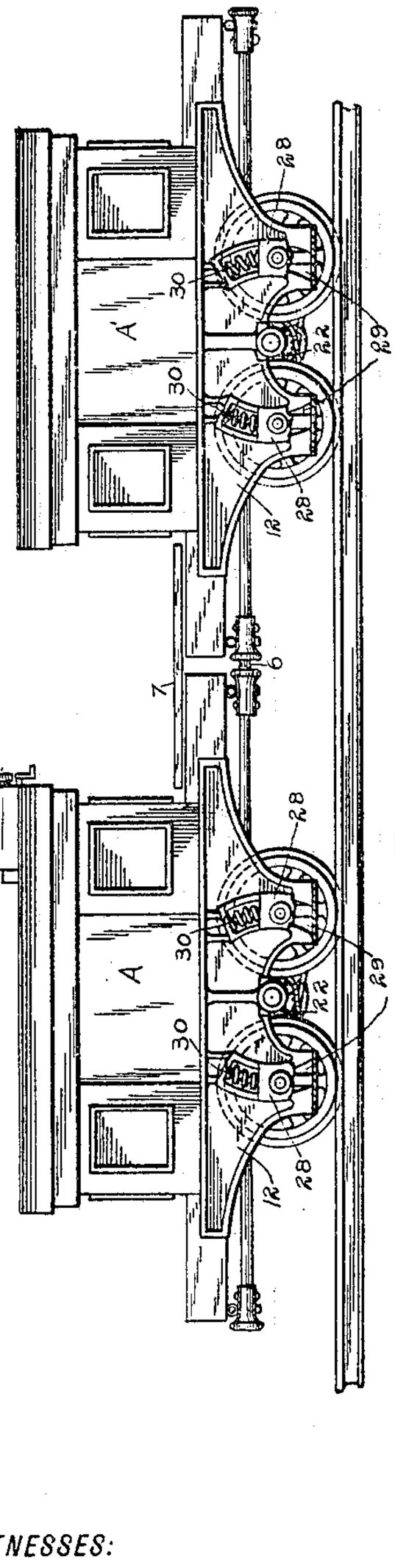
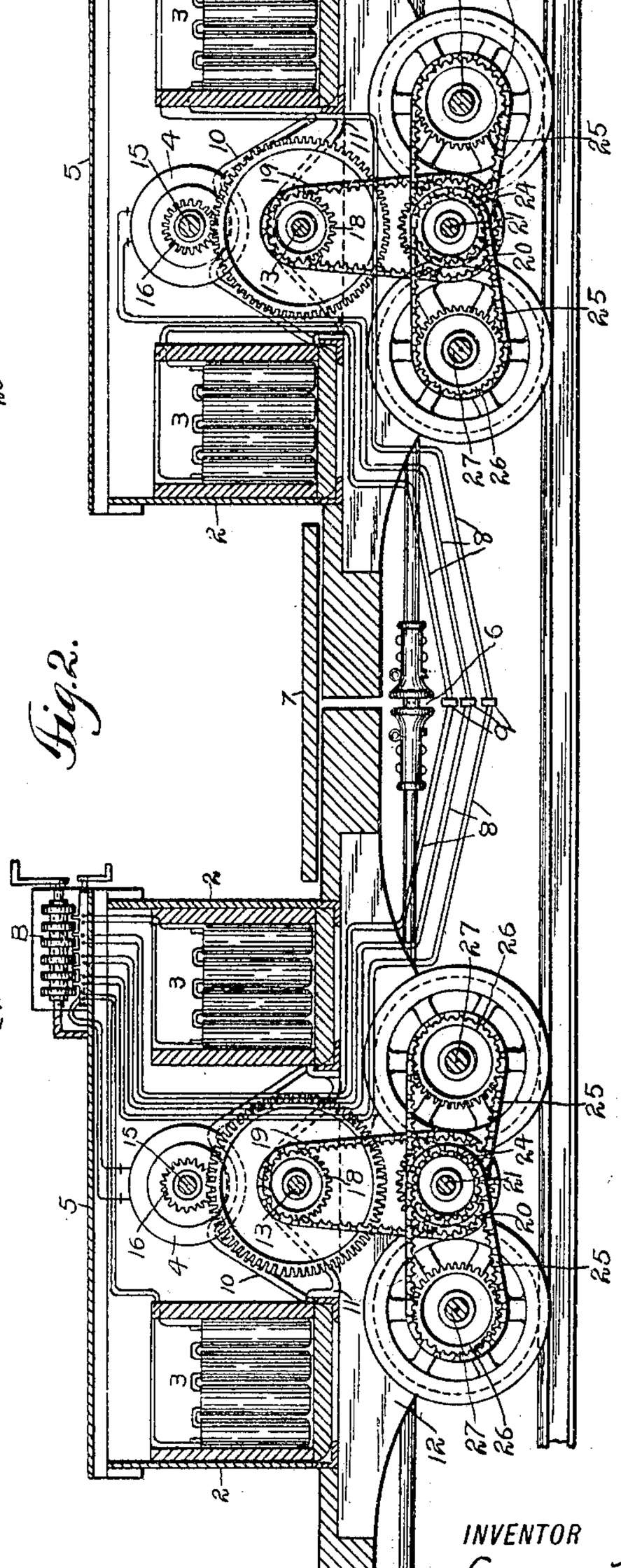


Fig. 2.



WITNESSES:

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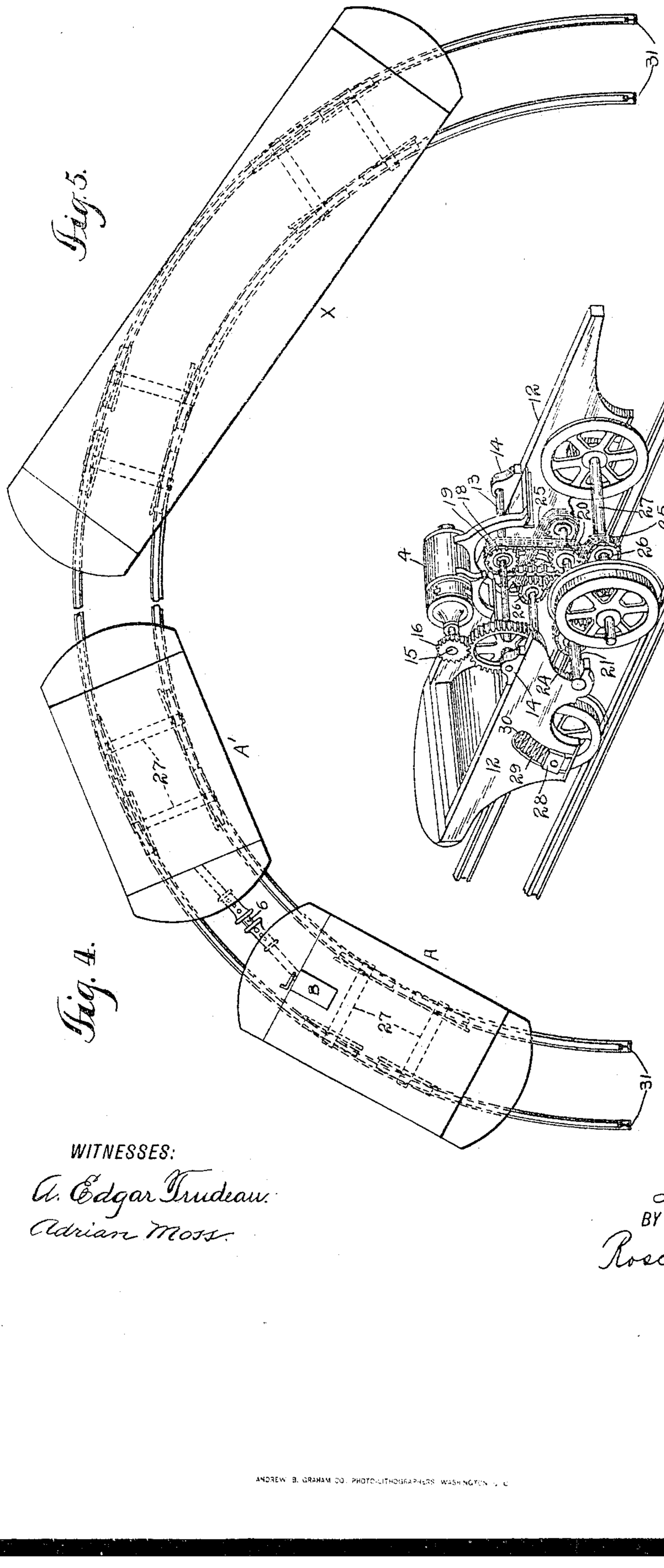

Fig. 5.

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

LINCOLN MOSS, OF NEW YORK, N. Y., ASSIGNOR TO ROBINS CONVEYING BELT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ELECTRIC LOCOMOTIVE.

No. 801,602. Specification of Letters Patent. Patented Oct. 10, 1905.

Application filed February 2, 1904. Serial No. 191,685.

To all whom it may concern:

Be it known that I, LINCOLN MOSS, of New York, State of New York, (post-office address 62 Madison avenue, borough of Manhattan, city of New York,) have invented certain new and useful Improvements in Electric Locomotives, of which the following is a specification accompanied by drawings.

This invention relates to electric locomotives, and refers more particularly to that type of electric locomotives in which motion is transmitted from the shaft of the motor to the axles of the wheels by means of belt-gearing.

The invention comprises improvements in the general design of electric locomotives and in belt-gearing by which power is transmitted from the motor to the wheels.

Some of the objects of the invention are to provide a novel form of belt-gearing to connect the motor with the wheels of electric locomotives in such manner as to minimize the loss of power from friction and at the same time to provide for the variation in distance between the motor-shaft and the axles of the wheels occasioned by the compression and expansion of the springs upon which the motor is supported, to raise the motor well up out of the dust or mud to a convenient height for inspection, lubrication, and repair, and to support the motor entirely on springs instead of partly on springs and partly on the axles, as in the types of electric locomotives now in use.

A further object of the invention is to provide an electric locomotive consisting of two separable sections each of which carries its own motor, the two sections being so articulated as to form a unitary structure in which the two motors are controlled by a single controller mounted upon one of the sections and operated by an engineer standing on a footplate covering the articulation of the two sections of the locomotive.

In the attainment of the primary objects above mentioned and others of minor importance, which will be hereinafter indicated, I make use of the locomotive structure hereinafter described, illustrated in the accompanying drawings, in which corresponding parts are designated by similar characters of reference throughout and having the specific features of novelty pointed out in the appended claims.

In the drawings, Figure 1 is a view in side elevation of a complete locomotive standing upon a straight section of track. Fig. 2 is a view in longitudinal section, on a larger scale, through the locomotive, the ends of the truck-platforms and the couplers being broken away to save space. Fig. 3 is a view in perspective of the truck, motor, wheels, and gearing of one section of the locomotive, a portion of the truck being broken away to expose to view the system of link belt and gears comprising the gearing. Fig. 4 is a plan view of the improved locomotive shown on a curved track in order to show the diminution in the overhang obtained by making the locomotive in two articulated sections, the foot-plate covering the articulation being removed to show the coupling devices employed in connecting the two sections of the locomotive. Fig. 5 is a plan view of a locomotive of the ordinary type comprising two trucks and a single motor and supporting-platform standing upon a section of track having the same degree of curvature as that shown in Fig. 4.

Referring now to the drawings, and more particularly to Figs. 1 and 2 thereof, A and A′ designate generally the two sections of the locomotive, the section A bearing on the top thereof at the end adjacent to the articulation with section A′ a controller B, the internal construction of which may be of any approved design. Each of the two locomotive-sections A and A′ consists of a truck which is provided with a casing 2, in which are incased two storage batteries 3 3, which are arranged in the ends of the casing, and the motor 4, supported between the batteries.

The batteries and motors employed in the construction of the locomotive may be of any approved design, and hence diagrammatic illustration only is deemed sufficient for the purposes of this specification.

Each of the casings 2 is provided with a cover 5, which is preferably removable to permit access to the structures contained within the casing, and the casings are preferably made somewhat shorter than the trucks in order to leave sufficient space at each end for a man to stand on the truck. The ends of the trucks are rounded, as shown, to facilitate the passage of trains around sharp curves without jamming the sections of the locomotive together or bringing them into contact with the cars.

The two locomotive-sections A and A′ are coupled by any suitable coupling devices, as

the ordinary link-and-pin couplers, (indicated at 6,) and to breach the space between the adjacent ends of the trucks of the two locomotive-sections a foot-plate 7 is mounted on the end of section A and projects over the end of section A′, as best shown in Fig. 2. The two locomotive-sections A and A′ are also connected by the wires 8, leading from the controller B on section A to the batteries and motor on section A. These wires are provided at points between the two locomotive-sections with coupling members 9, which can be uncoupled when desired to detach section A′ and use section A alone in hauling light loads.

As the exact nature of the coupling devices employed for connecting the wires 8, which are carried by one locomotive-section, with those carried by the other is not germane to the present invention, the wires and coupling devices have been diagrammatically illustrated, and no attempt has been made to show the exact arrangement of the several parts.

Each of the motors 4 is preferably supported upon arched brackets 10, rising from transverse angle-bars 11, extending across the trucks between the sides 12 thereof and affording means for supporting the motor directly above a shaft 13, arranged transversely of the truck at the middle thereof and supported in bearing-blocks 14 on the sides 12. Each motor has an armature-shaft 15, as shown, and upon one end of the armature-shaft there is mounted a pinion 16, which meshes with a spur-gear rigidly mounted on the shaft 13. Each shaft 13 also has rigidly mounted thereon a sprocket 18, over which travels a link belt or sprocket-chain 19, by means of which motion is imparted to a sprocket 20, fixed on a shaft 21, disposed directly below the shaft 13 and supported in bearing-blocks 22, attached to the lower surface of the sides 12 of the truck. The sprocket 20 is mounted about midway between the ends of the shaft 21, and upon either side of the sprocket 20 there is mounted on the shaft another sprocket 24, by which motion is imparted to a link belt 25, which travels over a sprocket 26 upon one of the axles 27. One of the link belts 25 drives the rear axle, and the other drives the front axle of the truck.

The axles 26 turn in journal-blocks 28, which are arranged for vertical sliding movement in curved slots 29 in the side members 12 of the truck, and spiral compression-springs 30 are arranged in the slots between the upper ends thereof and the tops of the journal-boxes, thus affording a yielding support for the truck and structures carried thereby. The front and rear sides of each of the slots 29 have the form of arcs of circles with shaft 21 as their centers, so that the movement up or down of the journal-blocks 28, due to a greater or less compression of the springs 30, causes no variation in the length and tension of sprocket-chains 25.

The axles are placed as close together as is consistent with the stability of the truck, and each is provided with a pair of wheels of any ordinary type for travel on T-rails of the form shown at 31.

A locomotive constructed in the manner above described is operated by an engineer standing upon the foot-plate between the two locomotive-sections, and the current through the wires 8, leading to the locomotive-section A′, and the wires leading from the controller to the batteries and motor on locomotive-section A are all controlled by the same controller B. When the locomotive comprising the two sections is in use drawing heavy loads, both motors will be driven at the same rate of speed, and by means of the gearing described each motor will transmit motion to both of the axles connected therewith at the same rate, thus making the articulated locomotive operate in precisely the same manner as a locomotive of the ordinary type, (illustrated at X,) which comprises two trucks supporting a single platform and having batteries and motors capable of developing an equal amount of power.

The arrangement of belt-gearing by which the power is transmitted from the shaft 13 on each truck to the axles is designed to eliminate as far as possible the loss of energy from friction and at the same time will not be disturbed in its operation by the vertical vibration of the truck as the locomotive passes over rough sections of track.

The shaft 21, which is mounted in the bearings rigidly secured to the sides of the truck, is normally somewhat higher than the axles, as best seen in Fig. 2. Consequently if the link belts or sprocket-chains connecting the sprockets 24 with the sprockets on the axles are taut when the axles are in their normal position in the lower ends of slots 29, even if these slots were vertical and straight instead of being curved, any vertical movement of the axles up to the points at which the axes of the axles lie in the same vertical plane with the axis of the shaft 21 will cause only a slight slackening of the tension of the link belts and the movement of the axles upward, or, in other terms, the depression of the shaft 21 with the truck until the springs 30 meet their limit of compression cannot tighten the link belts sufficiently to interfere with the smooth operation of the gearing.

By connecting the shaft 16 with the shaft 21, which is supported at a fixed distance below the shaft 16, and then driving the axles from a shaft in almost the same plane therewith the necessity for using belt-tightening devices to keep the link belts connecting the parts of the mechanism under the requisite degree of tension is obviated and all unnecessary friction is avoided.

While I have described and shown the preferred form of embodiment of my invention,

it will be obvious that various changes in the structural details and precise relations of the several elements of the invention may be resorted to without departing from the spirit thereof or sacrificing any of its advantages, and I do not, therefore, limit myself to the exact structures shown and described, but reserve the right to make such changes therein as come within the scope of my claims.

What I claim as new, and desire to secure by Letters Patent, is the following:

1. An electric locomotive comprising a main and a supplemental section, and having a controller located at the end of the main section which is adjacent the supplemental section, and a foot-plate covering the articulation between the two sections.

2. In an electric locomotive, the combination with a truck, axles journaled in yieldably-supported journal-blocks on said truck and wheels on said axles, of a motor, a sprocket driven by said motor, a shaft mounted below said motor and substantially in the normal plane of said axles, a sprocket on said shaft, a sprocket-chain connecting said sprockets, and means for continuously driving said axles from said shaft.

3. In an electric locomotive, the combination with a truck having curved guide-slots in the side walls thereof, of journal-blocks slidably mounted in said slots, spring-supports for said journal-blocks, axles journaled in said blocks, wheels on said axles, a motor rigidly mounted on said truck, a counter-shaft mounted substantially between said axles and driven by said motor, and means for continuously driving said axles from said counter-shaft.

4. In an electric locomotive, the combination with a truck having curved guide-slots formed in the side faces of the truck near the ends thereof, said guide-slots being formed on curves having a common axis, of journal-blocks slidably mounted in said slots, spring-supports for said journal-blocks, axles journaled in said blocks, wheels mounted on said axles, a driving-shaft having its axis coincident with the axis of curvature of said guide-slots, and power connections between said shaft and said axles.

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

LINCOLN MOSS.

Witnesses:

EMIL CHAS. EGER,

ROSCOE L. PETERSON.