

No. 744,302.

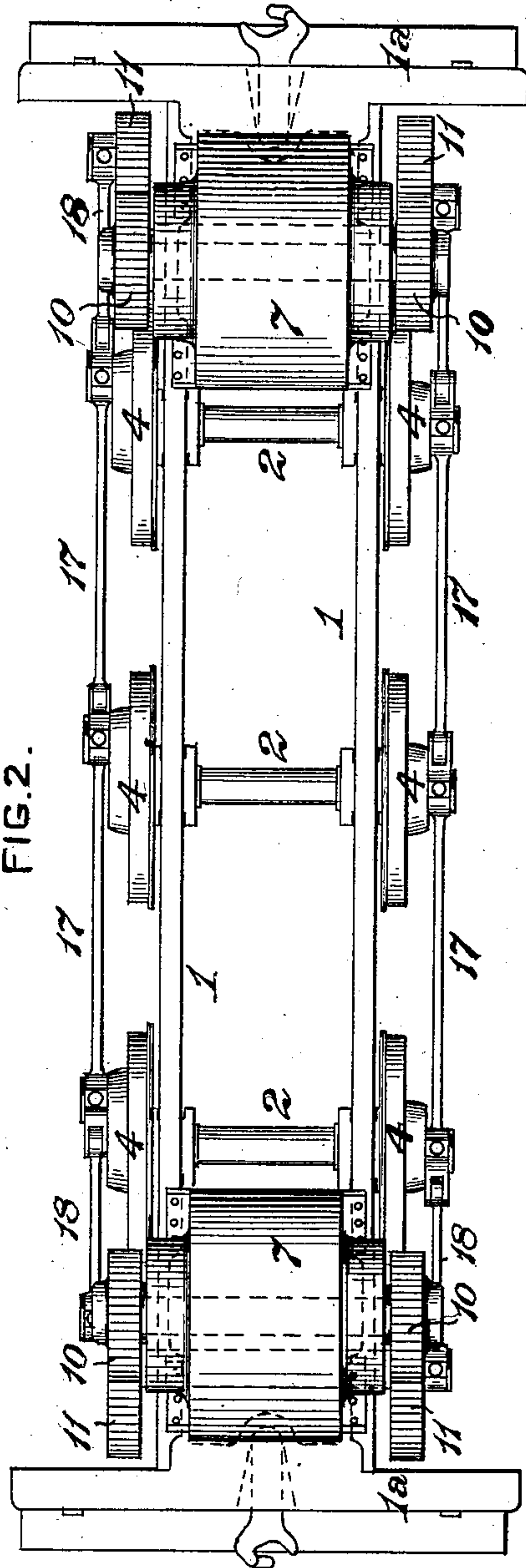
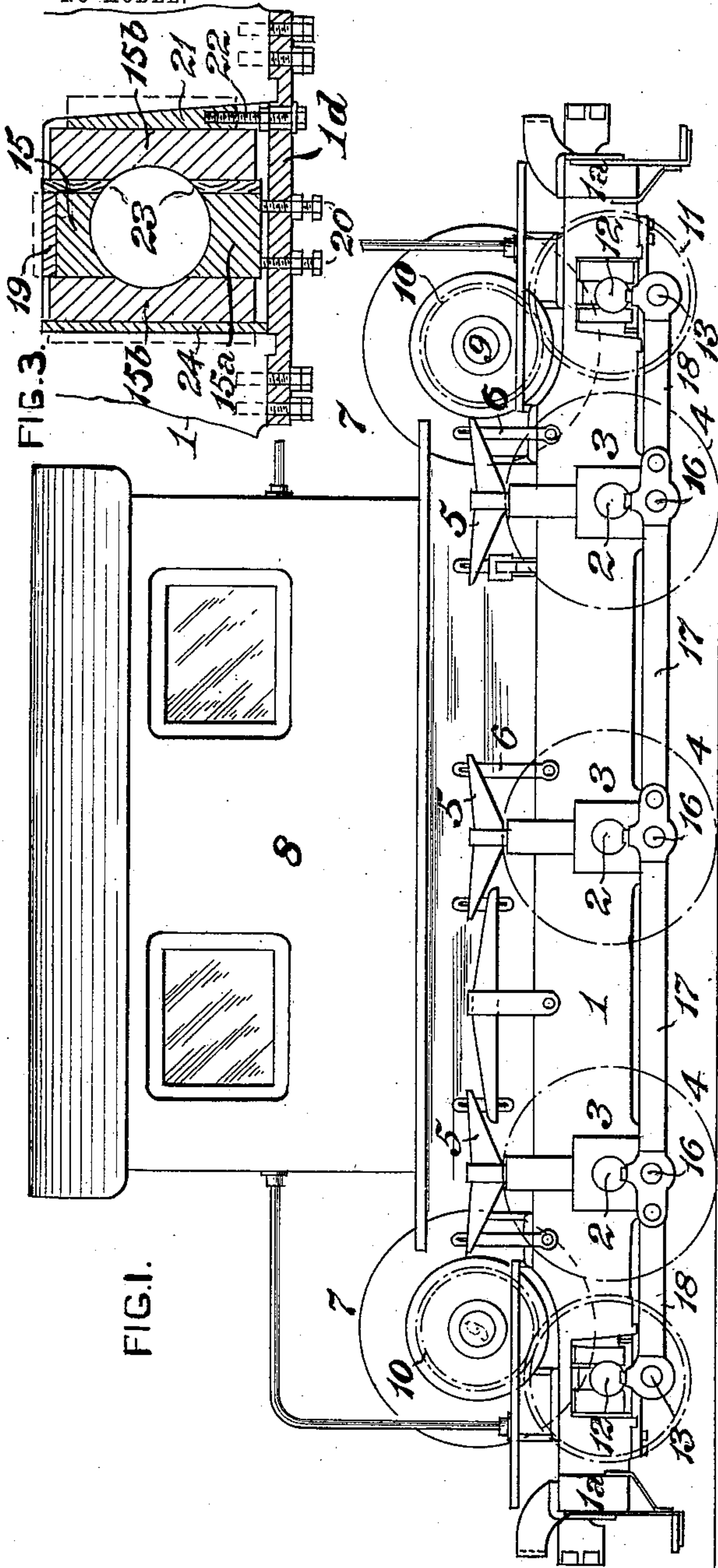
PATENTED NOV. 17, 1903.

W. DALTON & F. J. COLE.
ELECTRIC LOCOMOTIVE.

APPLICATION FILED JULY 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

James C. Herron.
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INVENTORS.

William Dalton.
Francis J. Cole.
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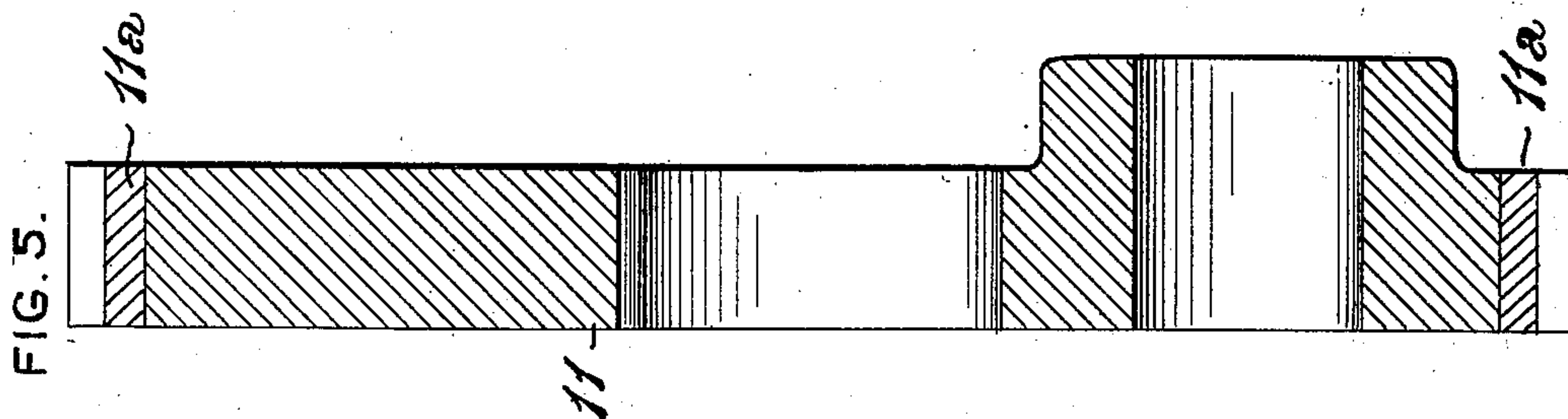
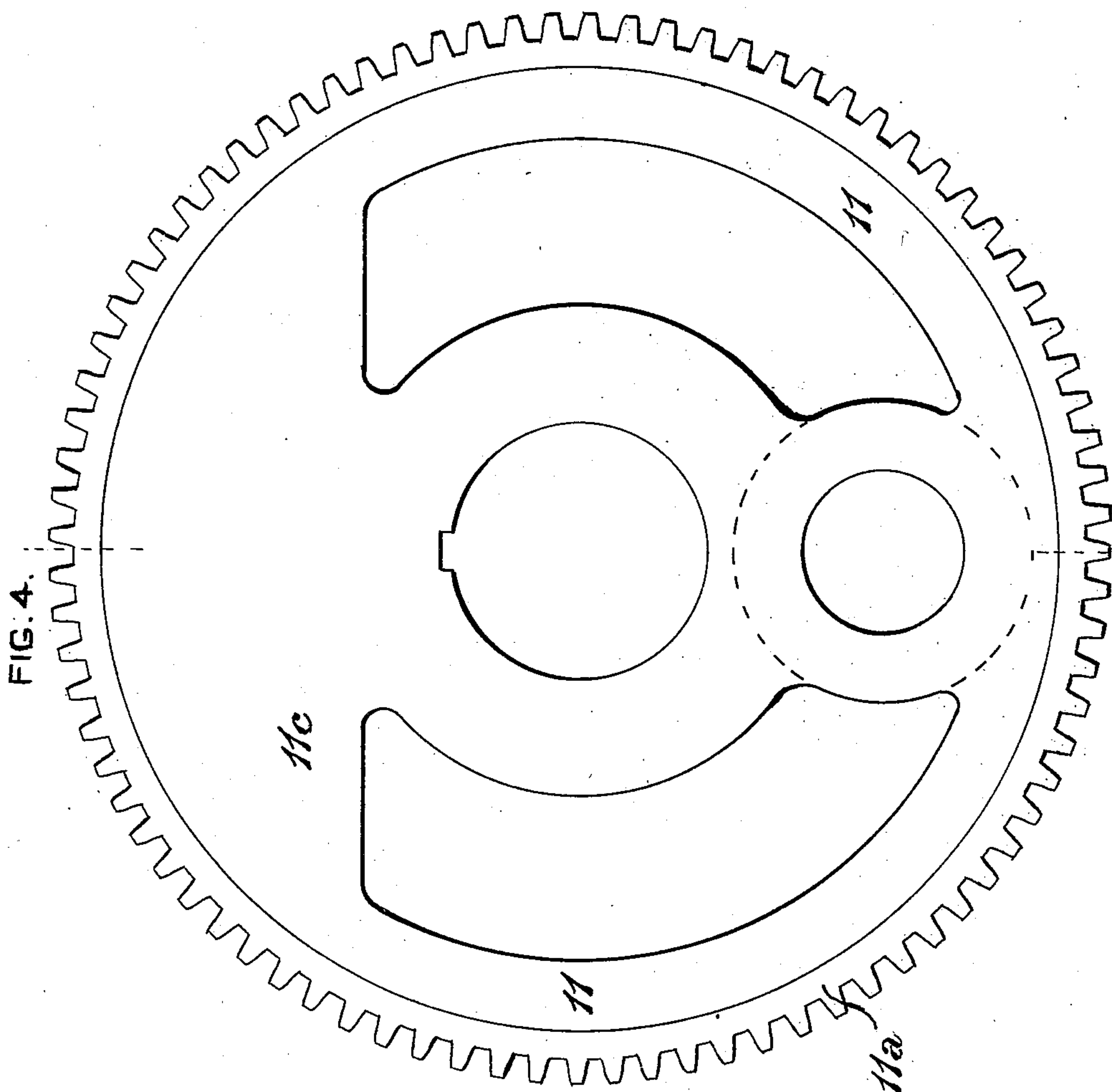
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INVENTORS

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UNITED STATES PATENT OFFICE.

WILLIAM DALTON AND FRANCIS J. COLE, OF SCHENECTADY, NEW YORK,
ASSIGNORS TO AMERICAN LOCOMOTIVE COMPANY, OF NEW YORK, N. Y.,
A CORPORATION OF NEW YORK.

ELECTRIC LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 744,302, dated November 17, 1903.

Application filed July 8, 1903. Serial No. 164,628. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM DALTON and FRANCIS J. COLE, both of Schenectady, in the county of Schenectady and State of New York, have jointly invented a certain new and useful Improvement in Electric Locomotives, of which improvement the following is a specification.

The object of our invention is to provide in an electric locomotive of the type in which the power of the motor is transmitted through the intermediation of gearing effective and desirable means whereby strain and wear of the driven or crank shaft may be compensated, so as to maintain the normal length of the connecting-rods coupled thereto and the accurate engagement of the gearing and also to increase the working life of the gears without substantial increase of cost and enable them to be readily and inexpensively renewed when required.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view in elevation of an electric locomotive illustrating an embodiment of our invention, the driving-wheels being shown in broken lines and the gearing indicated by broken circles; Fig. 2, a plan or top view with the cab and spring-rigging removed; Fig. 3, a vertical longitudinal section, on an enlarged scale, through a bearing of one of the crank-shafts; Fig. 4, a side view, in elevation and on a further enlarged scale, of one of the crank-shaft gears; and Fig. 5, a transverse section through the same.

Our invention is herein exemplified as applied in an electric locomotive the supporting-frame of which comprises two continuous side frame members 1, in or on which are formed or fixed jaws or pedestals for the reception of the journal-bearings of a plurality of driving-axes 2, in this instance three in number, upon which the driving-wheels 4 are secured. The side frame members 1 are connected at their ends by transverse buffer-

beams 1^a, and the frame is supported upon the driving-axes through the intermediation of springs 5, which rest upon saddles on the journal-boxes 3 and are connected to the frame by spring-hangers 6, as in ordinary steam-locomotive practice. The detailed construction of the spring arrangement does not form part of our present invention, and the same is not, therefore, herein at length set forth.

Power for the rotation of the driving-axes 2 is imparted thereto from an electric motor or motors 7 of any suitable and preferred construction, two being preferably employed, one at each end of the locomotive, as shown in the drawings. Each of the motors 7 is located between the side frame members 1 and as close as practicable to the bumper-beam 1^a at the adjacent end of the locomotive. The width of the motor is made as great as will permit it to fit between the side frame members 1, and in order to enable as wide a motor as possible to be employed the side frame members may, if desired, be reduced in thickness by being relieved on their inner sides throughout the portions of their length which adjoin the motor. Each of the motors is suitably secured to the side frame members, and an unobstructed space is left above the motor, the cab 8 being located between and entirely clear of the motors at the opposite ends of the locomotive.

Each of the motor-shafts 9 has fixed upon its outer ends spur-gears 10, the teeth of which engage those of corresponding gears, which are fixed upon a crank-shaft 12, journaled in bearings in the side frame members 1 in the horizontal plane of the driving-axes 2. The crank-shaft gears, which serve also as crank-disks, are composed of a body or center 11, which is preferably made of material of comparatively low cost, as cast-iron, and a toothed rim 11^a, of hard tough material, as steel, which is secured removably upon the periphery of the center in any suitable known manner, preferably by being shrunk on. A crank-pin

13 is secured in each of the gear-disk centers 11^a and is coupled by a main connecting-rod 18 to a crank-pin 16 on the adjacent driving-wheel 4. A counterbalance 11^c is preferably
 5 formed upon or secured to the center 11 to balance the weight of the connecting-rod 18. The crank-pins of the driving-wheels on each side of the locomotive are coupled one to another by side or coupling rods 17, so that the
 10 several driving-axles 2 shall be coincidentally rotated.

The combined gear and crank-disk above described affords the advantage of enabling the renewal of the gear-teeth when worn to
 15 be readily made and at less cost than if an integral gear had to be substituted, as in the ordinary practice. Further, the working life of the gear may be increased without corresponding increase of cost, as the center can
 20 be made of material of comparatively low cost and a higher grade of material be employed in the toothed rim, which constitutes only a comparatively small portion of the entire mass of the gear and crank-disk structure.
 25

In order to enable the crank-shaft 12 to be accurately maintained in its normal relation both to the motor-shaft and to the adjacent driving-axle 2, to which it is coupled, means
 30 are provided for the adjustment of its bearings, both vertically and horizontally, as may from time to time be necessary or desirable. To this end the crank-shaft journals are mounted in sectional bearings, which are fitted with the capacity of relative adjustment
 35 in jaws or pedestals in the side frame members 1 and which comprise an upper bearing 15, a lower bearing 15^a, and two lateral bearings 15^b, all of which are curved on their
 40 sides abutting on the crank-shaft journal in arcs of substantially the radius thereof. Vertical adjustment of the shaft is provided for by a removable liner 19, fitting between the upper bearing 15 and the top of the pedestal
 45 and by adjusting-screws 20, abutting on the lower bearing 15^a and engaging threads in the pedestal-brace 1^d. Horizontal adjustment is provided for by a wedge 21, fitting between one of the lateral bearings 15^b and
 50 an adjacent inclined side of the frame-jaw or pedestal, said wedge being set up by an adjusting-screw 22, having nuts which bear on the upper and lower sides of the pedestal-brace, and by removable liners 23, fitting between the sides of the upper and lower bearings
 55 and the adjacent face of one of the side bearings. The horizontal adjustment may be further facilitated by the employment of a removable liner 24, inserted between the
 60 opposite side of the jaw and the adjacent lateral bearing 15^b, or, if preferred, a wedge 21 may be applied at each side of the pedestal.

The strains upon the crank-shaft in service are severe and involve corresponding wear of
 65 the parts, which, if not compensated, will pre-

vent the pitch-circles of the gears from remaining tangent to each other, as they should be for proper operation, and will also vary the working length of the connecting-rods, which should of course be kept constant. The pro-
 70 vision of the sectional adjustable bearings above described enables the operator to readily and accurately take up wear from time to time, as required, and thereby to maintain the gears and connecting-rods in normal op-
 75 erative relation.

We claim as our invention and desire to secure by Letters Patent—

1. In an electric locomotive, the combination of a supporting-frame comprising two
 80 side frame members, driving-wheels fixed upon axles journaled in said frame, an electric motor supported on the side frame members, a crank-shaft journaled in the side frame members, means for effecting the vertical and
 85 horizontal adjustment of the crank-shaft, gearing connecting the crank-shaft with the motor, and connections from the crank-shaft to a pair of driving-wheels.

2. In an electric locomotive, the combination of a supporting-frame comprising two
 90 side frame members, driving-wheels fixed upon axles journaled in said frame, an electric motor supported on the side frame members, a crank-shaft, sectional bearings fitted
 95 in the side frame members, in which bearings the journals of the crank-shaft are mounted, means for effecting the vertical and horizontal adjustment of the sectional bearings in the side frame members, gearing connecting
 100 the crank-shaft with the motor, and connections from the crank-shaft to a pair of driving-wheels.

3. In an electric locomotive, the combination of a supporting-frame comprising two
 105 side frame members, driving-wheels fixed upon axles journaled in said frame, an electric motor supported on the side frame members, a crank-shaft, upper, lower, and lateral bearings, each fitted in one of the side frame
 110 members and fitting on a journal of the crank-shaft, a removable liner and set-screws for effecting vertical adjustment of the bearings, a removable liner, a wedge, and an adjusting-screw for effecting horizontal adjustment of
 115 the bearings, gearing connecting the crank-shaft with the motor, and connections from the crank-shaft to a pair of driving-wheels.

4. In an electric locomotive, the combination of a supporting-frame comprising two
 120 side members, driving-wheels fixed upon axles journaled in said frame, an electric motor supported on the side frame members, a crank-shaft journaled in the side frame members, a pinion fixed upon the motor-shaft, a
 125 combined gear and crank-disk fixed upon the crank-shaft and comprising a center and a toothed rim secured removably thereon and meshing with the motor-shaft pinion, a crank-pin fixed on the center member of said com-
 130

bined gear and crank-disk, and a main connecting-rod coupling said crank-pin with a crank-pin on a driving-wheel.

5 A gear and crank-disk for a geared electric locomotive, in which are combined a center, a crank-pin fixed therein, a counterbalance fixed on the center on the opposite side of its axis from the crank-pin, and a toothed

rim secured removably on the periphery of the center.

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