

March 31, 1931.

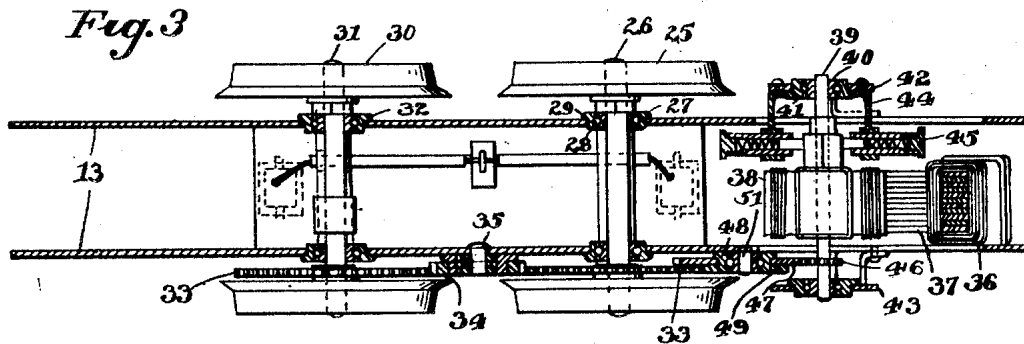
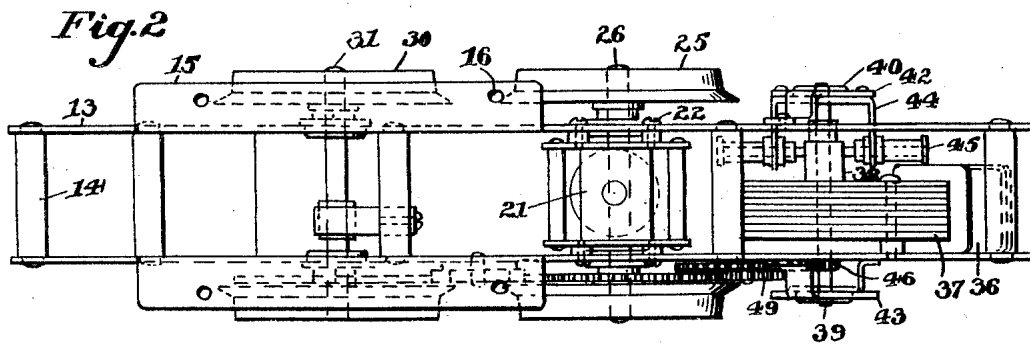
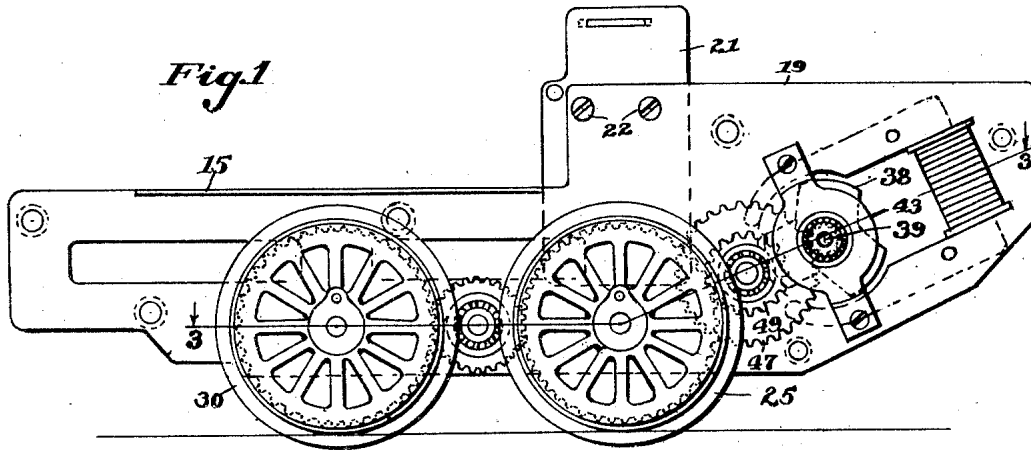
W. E. THORN

1,798,818

ELECTRIC MOTOR FOR TOY LOCOMOTIVES

Filed March 29, 1929

2 Sheets-Sheet 1



INVENTOR.
William E. Thorn

BY

Chamberlain & Neumann
ATTORNEYS.

March 31, 1931.

W. E. THORN

1,798,818

ELECTRIC MOTOR FOR TOY LOCOMOTIVES

Filed March 29, 1929

2 Sheets-Sheet 2

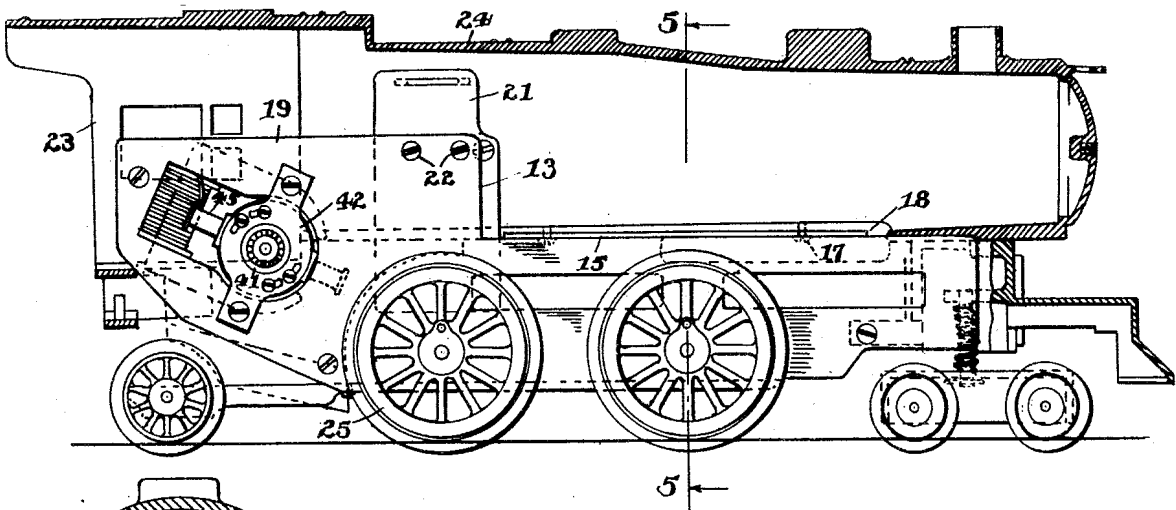


Fig. 4

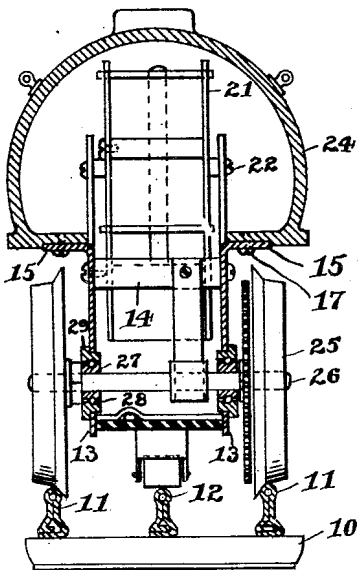


Fig. 5

Fig. 6

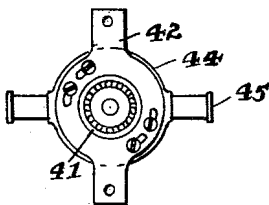
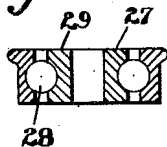


Fig. 7



INVENTOR,
William E. Thorn
BY
Shanklin & Neumann
ATTORNEYS.

UNITED STATES PATENT OFFICE

WILLIAM E. THORN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE IVES CORPORATION, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT

ELECTRIC MOTOR FOR TOY LOCOMOTIVES

Application filed March 29, 1929. Serial No. 350,941.

This invention relates to new and useful improvements in toy locomotives and more particularly to an electric motor therefor.

My motor frame is particularly designed for use in connection with a so-called steam type of toy locomotive and is adapted to be readily placed in the open underside of the boiler and cab and quickly attached or removed therefrom by means of a few screws, as occasion may require.

An object of the invention is to provide a motor frame that is higher and larger at its rear end than at its forward end, and one having the motor positioned in said rear end, to the rear of the rear driving shaft, whereby a direct line of drive gears from armature pinion to first driving wheel gear is made possible. In this connection I have provided an adjustable brush for the motor, including a bearing plate therefor which can be readily gotten at and easily adjusted should occasion require.

A further feature of the invention is to provide ball bearings for all shafts including the motor shaft, the outer member of said bearings being secured to the frame as by a forced fit, while the inner member may be similarly fastened to axle and shafts.

A still further object of the invention is to provide a collecting brush, preferably on the motor frame, having its free end resting on a commutator, carried on the driving wheel axle. The object of this brush is to provide a definite path from the wheels for electric current to motor frame in a manner to prevent electrolysis and pitting of the ball bearings.

I also provide adjusting means for the brushes positioned on opposite sides of the armature shaft, better to cut the magnetic lines of force as between the armature and field.

With these and other objects in view, the invention resides and consists in the construction and novel combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended, it being understood that various changes in the form, proportion, size,

and minor details of construction within the scope of the claims may be resorted to without departure from the spirit, or sacrificing any of the advantages of the invention.

Similar characters of reference denote like or corresponding parts throughout the several figures of the accompanying drawing forming a part of this specification and upon which:

Fig. 1 shows a side elevation of my improved electric motor unit for toy electric locomotives;

Fig. 2 is a top plan view of the same;

Fig. 3 is a longitudinal sectional view taken on line 3—3 of Fig. 1;

Fig. 4 shows a central vertical sectional view of a toy locomotive having my improved motor unit positioned therein, as seen from the opposite side of that shown in Fig. 1;

Fig. 5 is a vertical cross section taken on line 5—5 of Fig. 4 showing motor and boiler assembled;

Fig. 6 shows a front elevational view of bracket and attached plate for supporting armature shaft and brushes; and

Fig. 7 shows an enlarged sectional view of one of the ball bearings used in the motor frame.

Referring in detail to the characters of reference marked upon the drawings 10 represents a sleeper, 11 outside track rails and 12 an inner electric third rail, representing in part a track section such as is commercially manufactured and sold in connection with electric toy trains of this class.

The motor frame comprises two opposed companion side plates 13—13 which are secured in parallel spaced relation by pillars 14, of which there may be any desired number. These side plates each include an outwardly disposed longitudinal flange 15 having screw holes 16 therein for their attachment, as by means of screws 17, to parts 18 of the boiler member, the boiler being hollow and constructed to accommodate that portion of the motor unit extending above said flanges.

The rear portion 19 of these frame plates extend above the flanges 15 and likewise considerably to the rear of the rear driving wheel

so as to provide ample room between the said plates for the motor and its connected line of driving gears, also to provide additional room and means for removably supporting a commercial form of reversing unit 21, which is secured in the frame by means of screws 22. This extended and enlarged portion of the frame, with motor, gears and reversing unit can thus be better accommodated in the larger rear cab portion 23 of the locomotive 24, as shown in Fig. 4.

25 represents rear driving wheels which are secured upon axle 26 in any suitable manner 27 bearing members having annular raceways carrying balls 28 that are covered by an outer bearing ring 29 secured in the side plates of the frame in any suitable manner. The forward driving wheels 30 are also secured upon an axle 31 that is provided with ball bearings 32 similar to those for the rear axle and described above in detail.

A large brass pinion 33 is secured upon the near end of each axle and adjacent to the inner side of the driving wheels, in a way to turn with the same. These gears are operatively connected by an idler 34 mounted on a ball bearing somewhat like that described and shown in Fig. 7, though supported upon a stud 35 secured in the near side plate 13 of the frame so as to provide a direct and dependable driving means from one large gear to the other.

36 represents a motor that is detachably mounted between the side plates of the frame which are spaced to form a relatively large opening therebetween, better to permit the motor parts to be placed in position. This motor includes a field member 37 mounted in the frame and an armature 38 carried upon a shaft 39, which like the axles for the driving wheels, is provided with ball bearings. The inner members 40 of these bearings are secured to the ends of the shaft 39 while the outer ring members 41 are set in holes in brackets 42 and 43 secured to the frame plates. A plate 44 is adjustably secured to the inner side of bracket 42 and serves to support oppositely disposed brushes 45 radially positioned with respect to the armature shaft, to cut the magnetic lines of force, as between the armature and frame.

This armature shaft 39 also carries a pinion 46 which meshes with and drives a larger pinion 47 mounted upon an outer ball bearing sleeve 48 and to which a smaller pinion 49 is also secured, the latter gear being in mesh with the large gear 33 upon the rear axle for rear driving wheel. The bearing sleeve 48 forms the outer member of a ball bearing for supporting the said pinions 47 and 49, the inner ring member 50 being secured upon a stud 51 secured to the frame 15, there being a series of balls in raceways of the two said members 48 and 50.

Having thus described my invention, what

I claim and desire to secure by Letters Patent is:

1. The combination with a toy locomotive boiler and cab, of a motor frame secured therein having an enlarged rear end portion in said cab, including driving wheels, gears connecting the same, an electric motor positioned in the rear portion of the frame, and gear drive connections from motor to wheels.

2. In a toy locomotive, the combination with a hollow boiler and cab open upon their underside, the opening of the cab being larger than the boiler, a motor frame positioned therein and having an enlarged rear portion entering the cab, driving wheels, an electric motor positioned in said enlarged rear portion of the frame and cab, driving connections from motor to driving wheels.

3. A toy electric motor including a frame having an enlarged rear end portion, driving wheels carried by the frame, an electric motor positioned in said enlarged rear portion of the frame, and gear connections between the motor and drive wheels.

4. A toy electric motor including a frame having an enlarged rear end portion, driving wheels carried by the frame, gears connecting said driving wheels, an electric motor positioned in said enlarged rear portion of the frame, and gear connections between the motor and drive wheels.

5. A toy electric motor including a frame having an enlarged rear end portion, driving wheels carried by the frame, an electric motor positioned in said enlarged rear portion of the frame, an electric reversing unit also positioned in the enlarged portion of the frame.

6. A toy electric motor including a frame having a portion extended out beyond one of the driving wheels, driving wheels carried by the frame, an electric motor mounted in said extended portion, a brush holder adjustably secured to the frame for the motor armature, and driving connections from the said motor armature to the said driving wheels.

7. A motor unit including a frame having horizontally disposed flanges along its upper edge portion and having rear portions extending above said flanges, a pair of driving wheels positioned in the frame beneath the flange portion and a second pair of drive wheels positioned in the enlarged portion of said frame, a gear connecting the two said driving wheels, a motor and driving connections positioned to the rear of the rear pair of driving wheels and connected therewith to drive the same.

8. A motor unit including a frame having an enlarged extended rear portion, two pairs of driving wheels rotatably mounted in the frame, gears connecting the two said pairs of driving wheels, a motor positioned in the enlarged end of the frame, and direct gear

driving connections to one of the said driving wheels.

9. In a toy locomotive, a frame including side plates having flanges along part of their upper edges, a hollow boiler and cab open on its under side and secured to said flanges, a part of said frame extending into said cab, driving wheels on said frame, an electric motor within that portion of the frame extending into the cab, and a driving connection from said motor to one of said driving wheels.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 21st day of March, A. D. 1929.

WILLIAM E. THORN.

20

25

30

35

40

45

50

55

60