May 6, 1952 R. E. GOODE, JR 2,595,936

TOY LOCOMOTIVE

Filed Dec. 5, 1947 2 SHEETS—SHEET 1

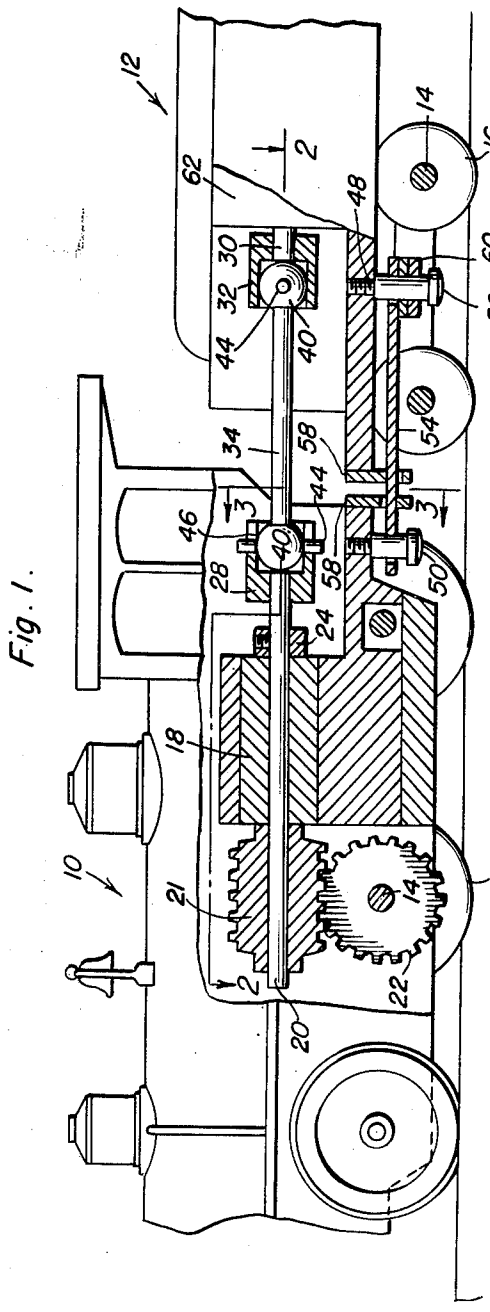


Fig. 1.

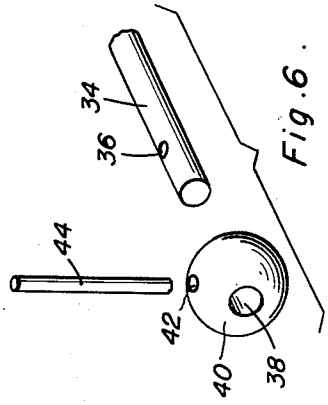


Fig. 6.

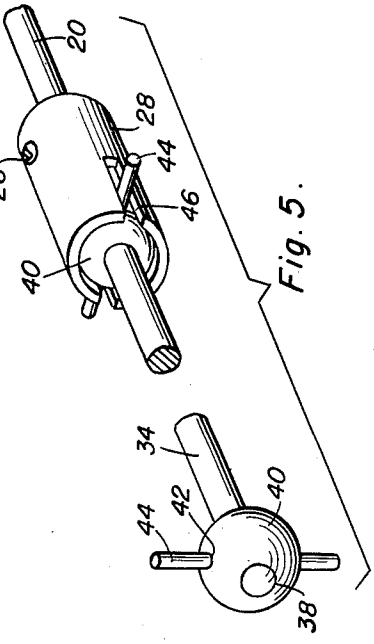


Fig. 5.

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2 SHEETS--SHEET 2

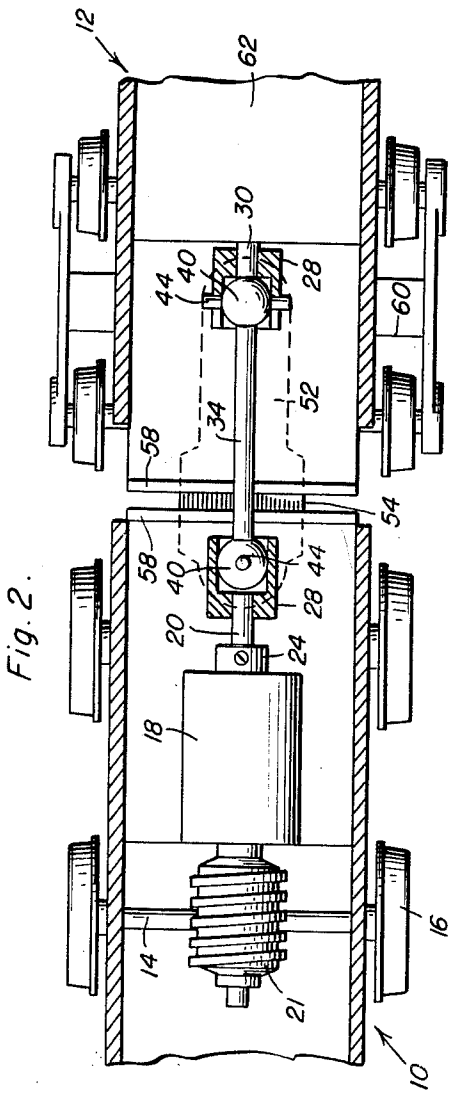


Fig. 2.

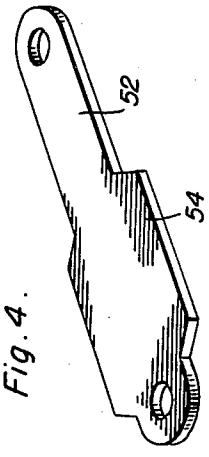


Fig. 4.

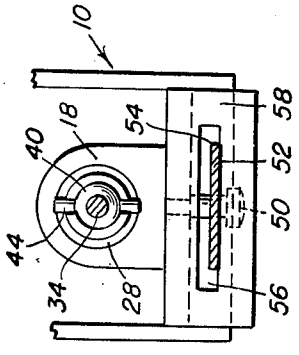


Fig. 3.

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Patented May 6, 1952

2,595,936

UNITED STATES PATENT OFFICE

2,595,936

TOY LOCOMOTIVE

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Application December 5, 1947, Serial No. 789,821

8 Claims. (Cl. 105—75)

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This invention relates to new and useful improvements in toy locomotives and the primary object of the present invention is to provide a locomotive having a tender and including means carried by the locomotive and tender that permit a more equalized distribution of weight on the driving wheels of the locomotive; increases the balance weight of the toy to afford greater tractional engagement of the wheels with a track; and, increases the normal driving power for the device.

Another important object of the present invention is to provide a connecting link between the locomotive and tender so designed as to prevent torque effects from the motor mounted in the tender from tipping the tender, causing unnecessary strain on the drive arrangement, or on any other type of flexible shaft or universal jointed drive.

A further object of the present invention is to provide a locomotive of relatively small size so constructed as to permit a tender supporting a relatively large concealed motor to be conveniently and operatively attached to the locomotive.

A still further aim of the present invention is to provide a toy locomotive that is simple and practical in construction, efficient and reliable in use, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the locomotive and tender constructed in accordance with the present invention, and with parts thereof broken away and shown in section;

Figure 2 is a longitudinal horizontal sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is a transverse vertical sectional view taken substantially on the plane of section line 3—3 of Figure 1;

Figure 4 is a perspective view of the link means used in conjunction with the present invention;

Figure 5 is a fragmentary perspective view of the coupling means between the driven shaft, and with parts of the shaft broken away and shown in section; and,

Figure 6 is a fragmentary group perspective view of the spherical element and guide bar carried by the driven shaft.

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Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a toy locomotive generally and 12 its tender. Both the locomotive and tender are provided with a suitable number of axles 14 supporting wheels 16.

Journaled in a bearing 18 mounted on the chassis of the locomotive is a driven shaft 20 provided with a substantially cylindrical worm gear 21 fixed at one terminal portion, that engages a worm wheel 22 fixedly mounted on a selected axle of the locomotive.

A collar 24 removably carried by shaft 20 limits longitudinally movement of the shaft relative to the bearing.

Removably secured to the opposite end of shaft 20, by a countersunken set screw or the like 26, is a sleeve 28 closed at its innermost end.

Journaled on a portion of tender 12 is a drive shaft 30 on which is removably mounted a second sleeve 32 closed at one end.

The numeral 34 represents a longitudinal driven shaft provided with transverse apertures 36 at each end thereof that are disposed at right angles to each other. The terminal portions of shaft 34 engage a central bore 38 provided in a spherical element 40. A second bore 42 provided in the element 40, at right angles to bore 38, communicates with the respective apertures 36 so that a guide and locking bar 44 may be inserted through the shaft and the element to retain the same in a fixed position to each other, with the bars at each end of the shaft at right angles to each other, as shown in Figure 5 of the drawings.

The ends of the bars 44 project outwardly from the element 40 to engage longitudinal slots 46 provided in sleeves 28 and 32.

Receivably engaged in internally threaded apertures at the underside of both the tender and the locomotive, are the externally threaded ends 48 of shouldered screws 50 on which are loosely mounted the terminal ends of substantially flat connecting link 52, as thus shown in Figure 4 of the drawings. The central portion 54 of the link 52 is of increased width and loosely engages the slots 56 provided in the brackets 58 depending from the locomotive and tender. One terminal end of the link bears on the usual bolster bar 60 carried by the tender. It should be noted, that the bracket 58 carried by the tender bears upon the link 52 and that the link 52 bears upon the bracket 58 mounted on the locomotive for a purpose which will later be more fully described.

In practical use of the present invention, as the motor **62** mounted within the tender and operatively connected to shaft **30** is actuated, shaft **30** rotates causing a like rotation of shaft **34**, and as the sleeve **32** is connected to shaft **30** by means of the element **40** and pin **44**, likewise shaft **20** is rotated causing gear **21** to engage gear **22** for driving the locomotive either forwardly or rearwardly depending upon the direction in which the shaft **30** is rotating.

The novel and improved manner in coupling shaft **34** to shafts **30** and **20** permits the longitudinal axis of the locomotive to be at inclined angles with the longitudinal axis of the tender without affecting the normal forward or rearward movement of the locomotive.

The stability of the tender is assured by the arrangement of the link **52** between the locomotive and tender. The link can move sideways freely on screws **50** and can rock at right angles to the slots **54**, however, the link cannot rotate in the plane which intersects the slots **56** vertically, because of the width **54** of the link engaging the slots. The purpose for limiting the twisting movement of the link in slots **56** is to prevent torque caused by the motor **62** from twisting the tender over or out of line with the locomotive and this link also limits the angularity of the shaft **34** to shafts **20** and **30** to only that necessary for the device to go around curves.

The link **52** is also employed as a lever to transfer some of the weight of the tender and motor to the locomotive and then tends to increase the weight on the driving wheels. Even though the motor is of a size larger in proportion to the locomotive this link will still transfer some of the weight from the tender to the driving wheels of the locomotive so that the driving wheels of the locomotive will frictionally engage the track with a greater traction. Usually a locomotive is coupled to a tender in such a manner that the forward portion of the locomotive is of a weight slightly greater than the rear portion thereof, and the forward driving wheels of the locomotive frictionally engage a track or rail with a higher force of friction than do the rear driving wheels and the traction of the front driving wheels and rear driving wheels on the track is not equalized. However, the present link will transfer some of the weight from the tender or car pulled by the locomotive to the rear portion of the locomotive and more particularly to the rear driving wheels so that the force of friction between the rear driving wheels on the track is substantially equal to the force of friction between the forward driving wheels and the track. Such a link will also tend to maintain an equalized traction between all the driving wheels and the track.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a toy locomotive including a tender, a driving connection comprising, a driven shaft journaled in the locomotive, a second shaft between the locomotive and the tender, a flexible coupling connecting said shafts together, means for coupling said second shaft to a source of power, and link means between the locomotive and the tender preventing overturning of the tender due to torque reaction and transferring weight from the tender to the rear portion of the locomotive said link means being pivoted to the tender and the rear portion of the locomotive, and means carried by the tender bearing upon said link means.

2. The combination of claim 1 wherein said flexible coupling includes a sleeve removably carried by said driven shaft, a spherical element carried by said drive shaft and workable in said sleeve and means fixed to the element and slidably engaged with said sleeve.

3. The combination of claim 1 wherein said coupling includes a sleeve removably carried by said driven shaft, a spherical element carried by said drive shaft, a guide bar carried by said spherical element, and a longitudinal slot provided in said sleeve slidably receiving said guide bar.

4. The combination of claim 1 wherein said link means includes a plate having its terminal portions pivotally mounted on the locomotive and tender respectively.

5. In a toy locomotive, a tender, a link having its terminal portions respectively pivoted on the tender and locomotive, means carried by the tender bearing upon said link, means carried by the locomotive upon which said link bears, said link transferring weight from the tender to the rear portion of the locomotive, a motor in said tender, said locomotive having driven wheels, and a power transmitting drive shaft including a flexible coupling operatively connecting said power means to said driven wheels.

6. In a toy locomotive including a tender, brackets carried by the adjacent ends of said locomotive and said tender, each of said brackets having a horizontal slot therein with the horizontal slot in the bracket on the tender located below the horizontal slot in the bracket on the locomotive, a link, a first pivot removably securing one end of said link to said locomotive, a second pivot removably securing the other end of said link to said tender, a driven shaft journaled in the locomotive, a second shaft between the locomotive and the tender, a socket member on said driven shaft, a spherical element on said second shaft received in said member, a pin extending through said element and having ends projecting from said element, said member having a pair of guide slots receiving the ends of said pin, a source of power on said tender connected to said second shaft, said locomotive including a pair of driving wheels, and means operatively connecting said driving wheels to said driven shaft, said first pivot constituting the sole means for attaching said link and said tender to said locomotive and for retaining said element in said member.

7. In a toy locomotive including a tender, a driven member on said locomotive, a driving member on said tender and engaged with said driven member, and a link terminally pivoted to said locomotive and said tender and retaining said driven member engaged with said driving member.

8. In a toy locomotive including a tender, a longitudinally extending driven shaft rotatably supported by said locomotive, a longitudinally extending drive shaft on said tender, a sleeve mount-

ed on said shaft, a rod extending between said shafts, spherical elements on the ends of said rod and received in said sleeves for universal movement, a pin extending through each element and disposed at right angles to said rod, each of said sleeves having a pair of longitudinal slots, said slots receiving the ends of said pins, and a link terminally pivoted to the locomotive and to the tender and so mounted as to prevent overturning of the tender due to torque reaction and to transfer weight from the tender to the rear portion of the locomotive and also retaining the elements in said sleeves.

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