

Nov. 17, 1959

M. W. LA FEVER

2,913,250

TOY WAGON STEERING AND BRAKING SYSTEM

Filed Sept. 18, 1957

4 Sheets-Sheet 2

FIG. 2.

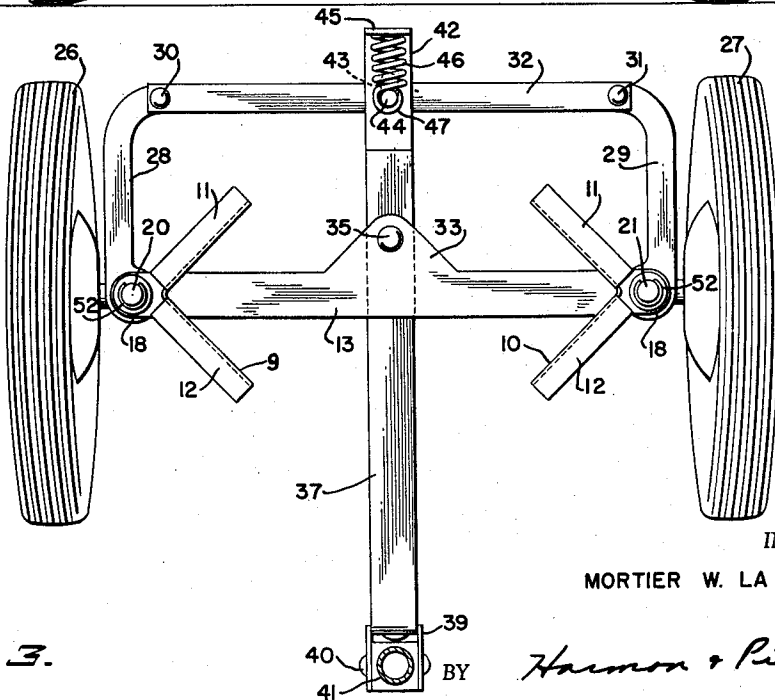
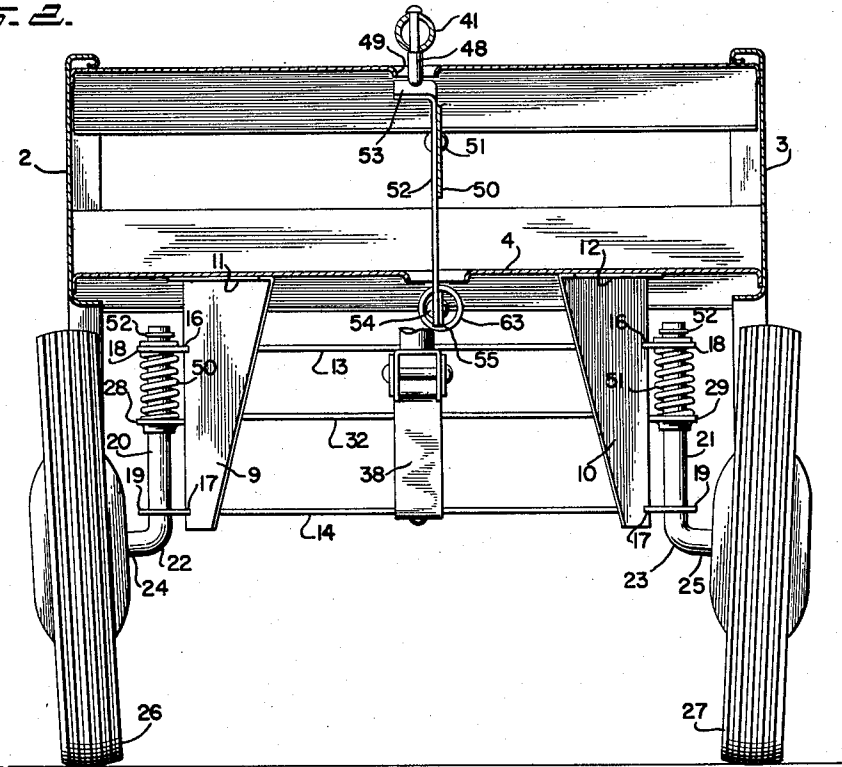


FIG. 3.

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4 Sheets-Sheet 3

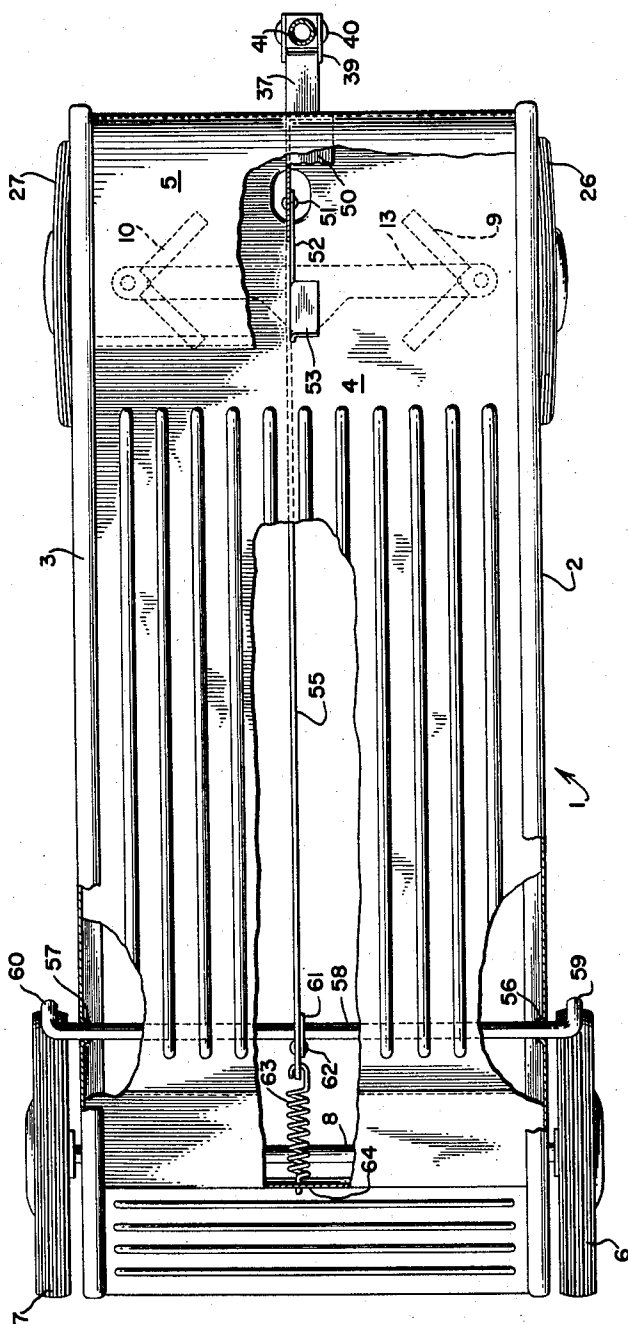


Fig. 4.

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4 Sheets-Sheet 4

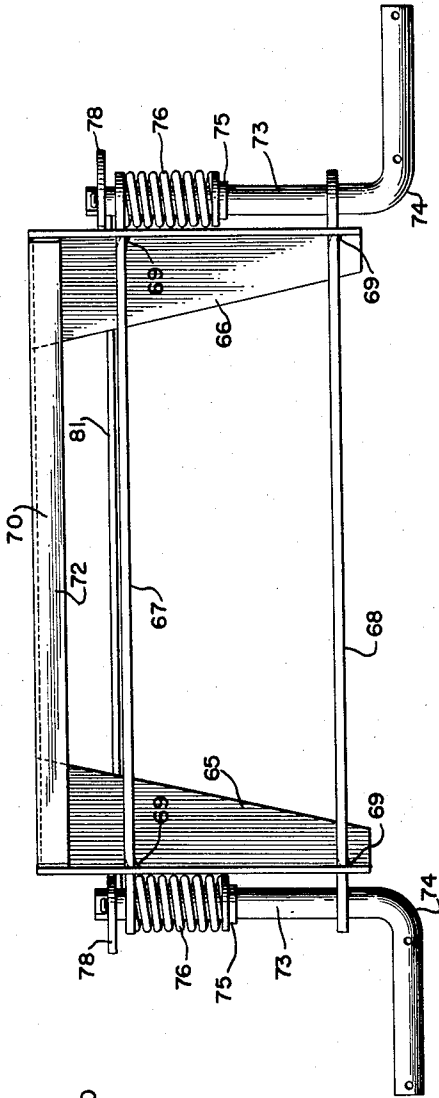


Fig. 7

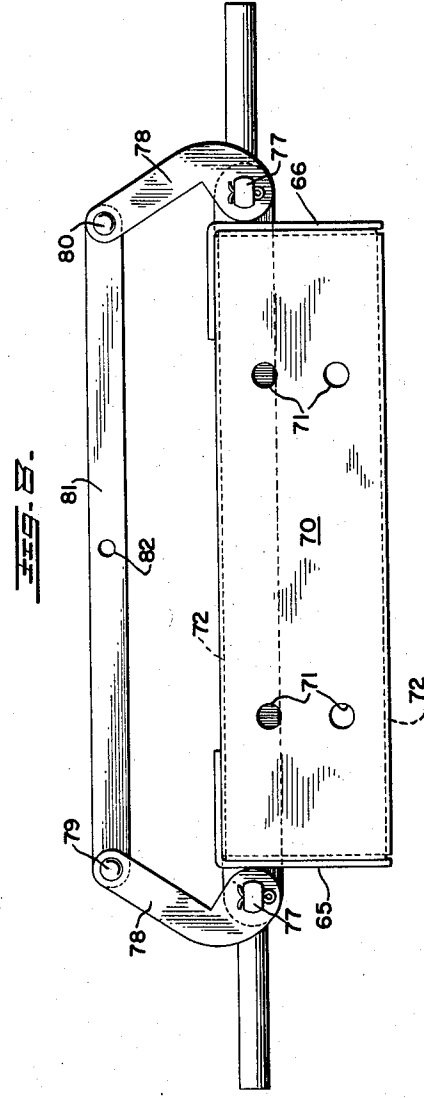


Fig. 8

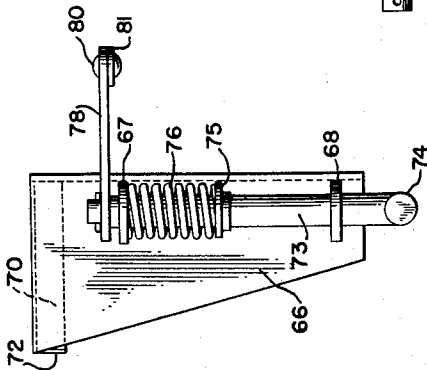


Fig. 9

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TOY WAGON STEERING AND BRAKING SYSTEM

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Application September 18, 1957, Serial No. 684,726

3 Claims. (Cl. 280—87.01)

This invention relates generally to toy wagons and more specifically to improvements in steering and braking systems for such wagons.

The primary object of this invention is to provide an improved steering linkage for toy wagons.

Another object of this invention is to provide a steering linkage for toy wagons which is so mounted and arranged as to reduce the sensitivity of the steering handle relative to similar systems of the prior art.

A still further object of this invention is to provide a novel support arrangement for the steering linkage of a toy wagon.

Another object of this invention is to provide a simple and novel braking system for toy wagons.

A further object of this invention is to provide a braking system for toy wagons which is operable by the steering handle.

With the foregoing and other objects in view the invention resides in the following specification and appended claims certain embodiments and details of construction of which are illustrated in the accompanying drawings in which:

Figure 1 is a sectional view in side elevation of the toy wagon comprising the invention;

Figure 2 is a sectional view in front elevation of the toy wagon of Figure 1;

Figure 3 is a top plan view of the steering linkage for the toy wagon of this invention;

Figure 4 is a partially sectional and cutaway top plan view of the wagon;

Figure 5 is a top plan view of a portion of the supporting bracket for the steering linkage of the wagon;

Figure 6 is a sectional view of the supporting bracket shown in Figure 5;

Figure 7 is a front elevational view of a modified form of steering linkage embodying mounting features of the preferred form of Figures 1 to 6;

Figure 8 is a top plan view of the steering linkage of Figure 7, and

Figure 9 is a view in side elevation of the steering linkage of Figures 7 and 8.

Referring now more particularly to Figures 1 to 6 inclusive, the toy wagon comprising the invention is illustrated as having a body 1 including side walls 2 and 3, a floor 4 and a front barrier 5. The wagon is illustrated throughout, except for the wheels, as being of metal construction. The improvements constituting the invention may be readily adapted to wagons with wooden or plastic material bodies.

The rear supporting wheels 6 and 7 are carried by an axle 8 secured to the side walls 2 and 3 in the manner described in a copending application Serial Number 683,242, filed September 11, 1957.

The steering linkage for the wagon is most clearly illustrated in Figures 2 and 3. This linkage consists of a plurality of parts which are first assembled and then secured to the floor 4 of the wagon. The assembly includes a pair of angled mounting brackets 9 and 10.

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Each bracket is provided with a pair of flanges 11 and 12 which engage the floor 4 of the wagon and are secured thereto after assembly of the linkage by welding or other suitable means such as bolts. Each bracket 9 and 10 is provided with a pair of spaced slots 16 and 17 of such a dimension as to receive a pair of stay bars 13 and 14. Each stay bar is provided with a pair of oppositely disposed struck out lips, one such lip 15 being clearly illustrated in Figure 6. Each lip 15 of each bar 13 and 14 engages an inner wall of a bracket 9 or 10 at the angle juncture thereof, while the bars 13 and 14 project through the slots 16 and 17. The projecting portion 18 of bar 13 at each end is provided with a hole 19. Bar 14 is provided with similar projections with holes therein.

Extending through the holes of each bar 13 and 14 in close sliding relationship are the vertical sections 20 and 21 of stub axles 22 and 23. On the horizontal sections 24 and 25 of axles 22 and 23 are mounted steering wheels 26 and 27. Secured about each vertical section 20 and 21 of stub axles 22 and 23 after they are inserted through the holes 19 of bar 14 are torque arms 28 and 29. These torque arms are secured to vertical sections 20 and 21 by welding but other suitable means such as cotter pins may be used. Connecting the two torque arms 28 and 29 together at pivot points 30 and 31 is a radius arm 32.

Each stay bar 13 and 14 is provided with a centrally located, rearwardly extending projection 33 and 34 respectively. Each projection 33 and 34 is perforated to receive pivot rivets 35 and 36. A tongue 37 is pivotally secured to stay bar 13 by rivet 35. A brace 38 for the tongue 37 is pivotally secured to the stay bar 14 by rivet 36. The tongue 37 and brace 38 are connected to a U-shaped bracket 39 by welding. Pivotal connection to bracket 39 by a pivot pin 40 is the wagon steering handle 41.

The wagon tongue 37 is provided with an offset portion 42 which includes a slot 43. Affixed to the radius arm 32 and upstanding therefrom through the slot 43 in tongue 37 is a pin 44. The offset portion 42 of tongue 37 is further provided with a vertical flange 45, to which is secured by welding or other suitable means a relatively strong coil spring 46. A forwardly projecting loop 47 of spring 46 is looped about the pin 44.

Projecting through handle 41 is a fulcrum pin 48 which engages in a hole 49 in barrier 5 of the wagon. The fulcrum pin 48 and rivets 35 and 36 are arranged to be in vertical alignment to aid in the steering operation by handle 41.

After the torque arms 28 and 29 are secured to the axles 22 and 23 coil springs 50 and 51 are placed about sections 20 and 21 respectively. The said sections are then directed through the holes 19 of stay bar 13 where they are secured against removal by C-rings 52. At this point with the steering linkage assembly complete the flanges 11 and 12 of the brackets 9 and 10 are secured to the floor 4 of the wagon. The connection between the flanges 11 and 12 with the floor, the angled shape of the brackets 9 and 10, and the stay bars 13 and 14 with the struck out lips 15 engaging in the angled corners of the brackets make a very substantial support for the steering linkage of the wagon.

When a child grasps the steering handle 41 and effects a steering action, he does so by moving the handle 41 about fulcrum pin 48 which engages the wall defining hole 49. The tongue 37 will be moved by the handle movement about rivet 35. The radius arm 32 will be moved by the tongue 37 by virtue of the lost motion connection between the slot 43 of the tongue 37 and the pin 44 of the radius arm. Movement of the radius arm 32 will simultaneously move the torque arms 28 and 29 and the axles 22 and 23 connected thereto. The

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arrangement of the radius arm 32 and torque arms 28 and 29 is that of a movable parallelogram. Since the pivot points defined by rivets 35 and 36 are offset relative to a line through the vertical sections 20 and 21 of axles 22 and 23, it is obvious that the lost motion connection with the radius arm 32 is necessary or the mechanism would not operate. The advantage in offsetting the rivets 35 and 36 is that for a given angle of movement of the steering handle 41 the radius rod and hence the wheels will be moved proportionately less to somewhat decrease the sensitivity of the wagon steering. The wagons of the prior art utilize a straight one to one steering ratio, whereas this invention reduces the ratio in accord with the offset positions of pivots 35 and 36. In other words, the effective portion of tongue 37 between rivet 35 and pin 44 is considerably shorter than the torque arms 28 and 29. Hence a given angular movement of the tongue will be transmitted through the radius arm to give a lesser angular movement of the torque arms 28 and 29. Any angular movement of the tongue 37 is resisted by the coil spring 46 which aids in straight steering, and acts to assist in returning the linkage and the wheels to the neutral position after a turning movement is completed.

The braking system for the wagon is illustrated in Figures 1 and 4. Secured by welding to the underside of front barrier 5 is a mounting bracket 50. Pivotally secured to bracket 50 by a rivet 51 is a brake pedal 52 having an offset flange 53 at one end which is engaged by the lower extremity of the fulcrum pin 48. The other end of pedal 52 is connected by a pivot pin 54 to a brake rod 55. Extending through holes 56 and 57 in side walls 2 and 3 of the wagon in rotary relationship therewith is a brake shoe 58. The shoe 58 is provided with downwardly directed ends 59 and 60 which when engaged against wheels 6 and 7 will provide friction braking. Affixed to the brake shoe 58 is a crank arm 61. The rear portion of brake rod 55 is secured by a pin 62 to the crank arm 61. A tension spring 63 is connected to the rear end of brake rod 55 at one end and to the rear end 64 of wagon floor 4 at its other end. The spring 63 biases the brake rod 55 rearwardly to keep the brake shoe in normal disengagement. The spring also acts to lift the steering handle 41 through the contact between flange 53 of brake pedal 52 and the fulcrum pin 48. The child operator of the wagon needs only to depress the steering handle 41 to rotate the brake shoe clockwise against the action of spring 63 to engage the brake. Release of the pressure on the handle 41 results in disengagement of the brake by action of the spring 63.

Figures 7, 8 and 9 illustrate a form of front wheel suspension and steering linkage which is readily adapted to kit marketing wherein the purchaser may readily put together a wagon himself. In this form of the invention angle brackets 65 and 66 are provided with spaced slots to receive stay bars 67 and 68. The stay bars 67 and 68 are provided with depressed, struck out tongues 69 which engage against the inner side walls of the brackets 65 and 66 adjacent to the slots. With the stay bars positioned in the brackets, the upper portions of the brackets are welded to a mounting box frame 70. The frame 70 is provided with a plurality of bolt holes 71 for mounting purposes. The frame 70 consists of a single piece of sheet metal with depending flanges 72.

Extending through holes in the portions of stay bars 67 and 68 projecting outwardly of the brackets 65 and 66 are the vertical sections 73 of stub axles 74. Affixed to each section 73 is a base 75 for a coil spring 76. The upper end of spring 76 engages the underside of the projecting end of stay bar 67. The springs 76 as thus mounted act as shock absorbers for the front wheels.

Engaging the oblong upper ends 77 of vertical sections 73 of axles 74 are torque arms 78. Connected between the other ends of torque arms 78 by pivot pins 79 and

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80 is a radius arm 81. Suitable connections with the steering tongue of a wagon (not shown) may be effected at the hole 82 in radius arm 81.

It is therefore seen that this modified form of steering linkage support may be readily adapted to kit marketing and home assembly.

It will be obvious to one skilled in the art that the preferred and modified forms of the invention may be subjected to numerous modifications well within the purview of this invention and the appended claims.

I claim:

1. A steering system for a toy wagon including steerable front wheels and a body having a barrier extending upwardly and rearwardly over a portion of the body, the barrier being provided with a hole comprising a pair of mounting bracket means secured to the wagon, a pair of stub axles, each axle having a horizontal section to carry a wheel and a vertical section to be pivotally connected to said bracket means, stay bar means interconnecting said bracket means, said stay bar means being provided with an offset projection, a torque arm secured to the vertical section of each stub axle, a radius arm pivotally secured at either end to a torque arm, said stay bar means, torque arms and radius arm forming a shiftable parallelogram linkage, tongue means extending from a point forward of the wagon body to a point rearward of the radius arm and being pivotally connected to the offset projection of the stay bar means and by a lost motion connection to the rearward end of the tongue and its pivotal lost motion connection with the radius arm to bias the parallelogram linkage toward a neutral or straight-forward steering position, a steering handle for the wagon pivotally connected to the tongue to effect steering of the wagon wheels upon turning by shifting the parallelogram linkage, and a fulcrum pin connected to the handle and extending into the hole in the front barrier of the wagon, said fulcrum pin when engaging said hole being in vertical alignment with the pivotal connection between the tongue and the stay bar means.

2. The invention according to claim 1 wherein said stay bar means includes upper and lower stay bars between the bracket means and wherein a brace is rigidly connected with the tongue at one end and by a pivotal connection with the lower stay bar, the said pivotal connection being in vertical alignment with the pivotal connection between the upper stay bar and the tongue and with the fulcrum pin.

3. A steering system for a toy wagon including steerable front wheels and a body having a front barrier extending upwardly and rearwardly over a portion of the body, the barrier being provided with a hole comprising a pair of mounting bracket means secured to the wagon, a pair of stub axles, each axle having a horizontal section to carry a wheel and a vertical section to be pivotally connected to said bracket means, stay bar means interconnecting said bracket means, a torque arm secured to the vertical section of each stub axle, a radius arm pivotally secured at either end to a torque arm, said stay bar means, torque arms and radius arm forming a shiftable parallelogram linkage, tongue means extending from a point forward of the wagon body to a point rearward of the radius arm and being pivotally connected to the stay bar means and to the radius arm, a steering handle for the wagon pivotally connected to the tongue to effect steering of the wagon wheels upon turning by shifting the parallelogram linkage, and a fulcrum pin connected to the handle and extending into the hole in the front barrier of the wagon, said fulcrum pin when engaging said hole being in vertical alignment with the pivotal connection between the tongue and the stay bar means, said stay bar means being provided with an offset projection in the direction of the radius arm, said projection providing the point of pivotal connection with the tongue and in which the connection between the tongue and the radius arm

is such as to provide for a lost motion when the linkage is shifted.

References Cited in the file of this patent

UNITED STATES PATENTS

1,420,999	Garrett	June 27, 1922	1,719,062	Lewis	July 2, 1929
1,496,993	Marcott	June 10, 1924	1,894,160	Clark	Jan. 10, 1933
1,701,434	Wright	Feb. 5, 1929	2,027,522	Eck	Jan. 14, 1936
1,717,384	Johnson	June 18, 1929	2,077,543	Barthel	Apr. 20, 1937
			2,191,868	Snow	Feb. 27, 1940
			2,245,908	Drake	June 17, 1941
			2,404,570	Elliott	July 23, 1946
			2,453,575	House	Nov. 9, 1948
			2,479,457	Baehl	Aug. 16, 1949