

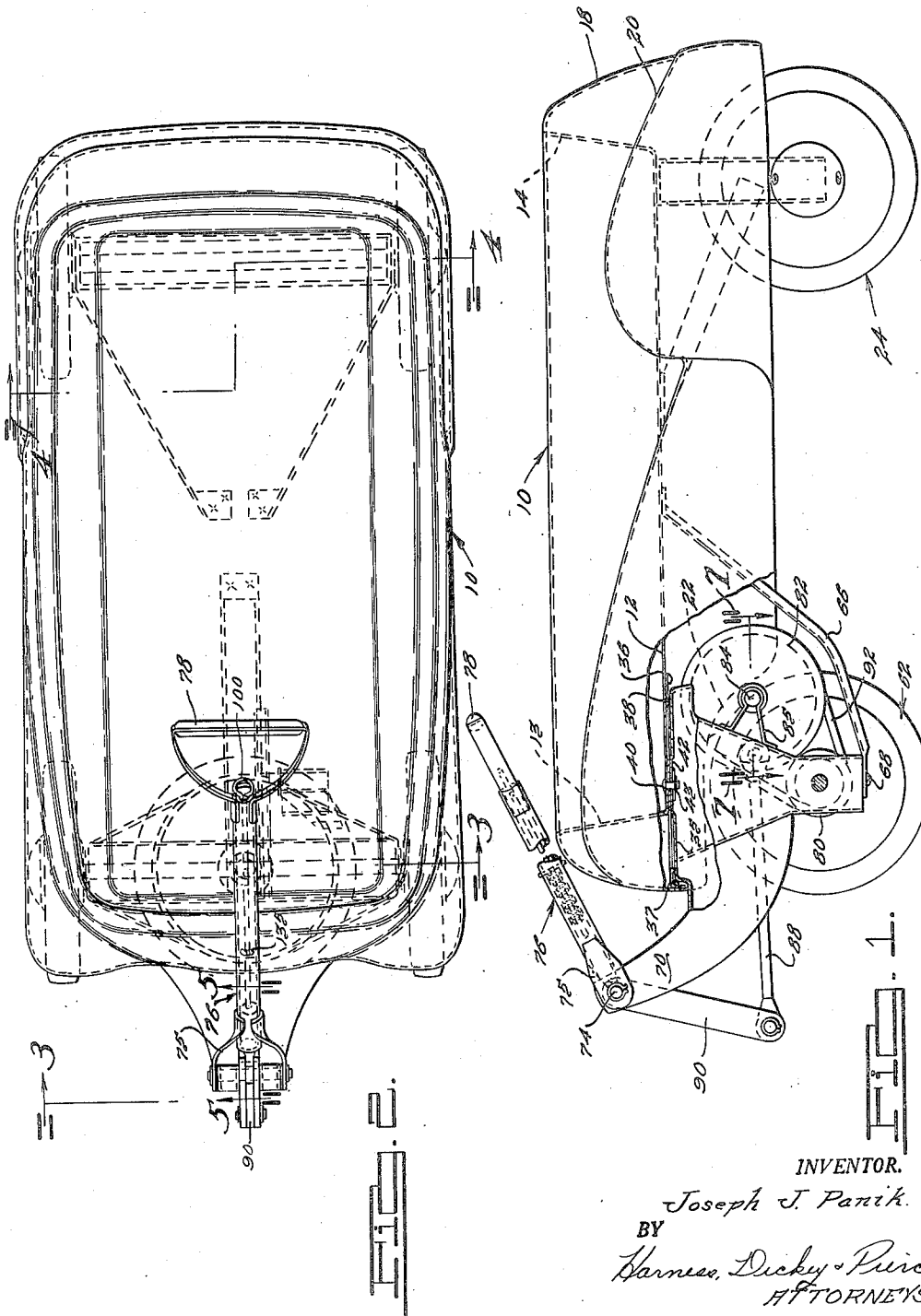
Jan. 17, 1950

J. J. PANIK
HANDCAR-COASTER WAGON

2,495,128

Filed May 29, 1947

2 Sheets-Sheet 1



INVENTOR.

Joseph J. Panik.

BY

Harner, Dickey & Pierce.
ATTORNEYS.

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J. J. PANIK

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2 Sheets-Sheet 2

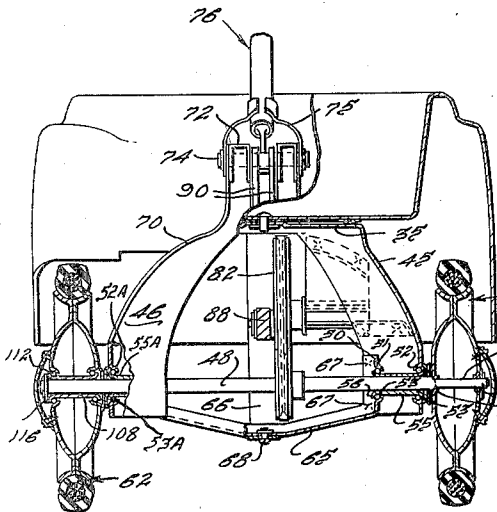


FIG. 3.

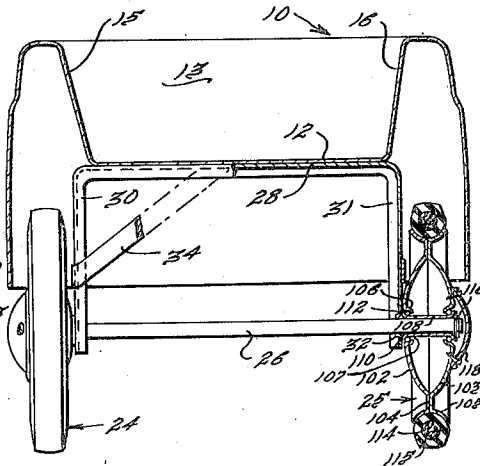


FIG. 4.

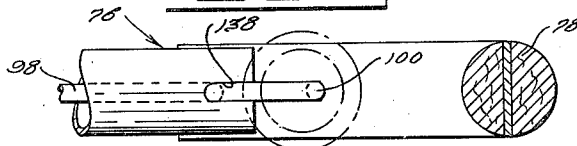


FIG. 5.

FIG. 6.

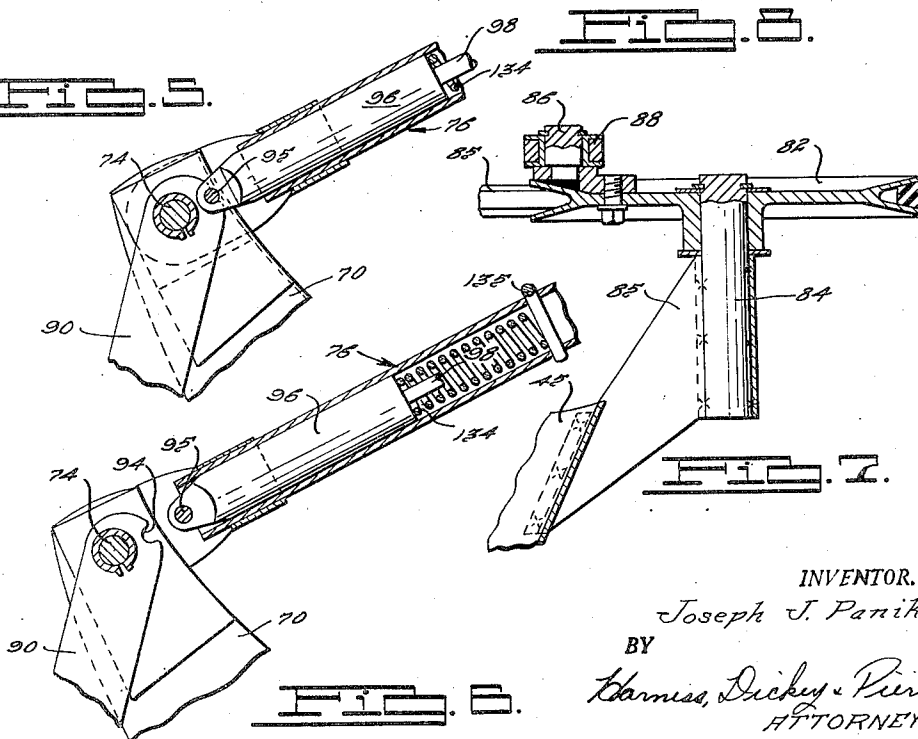


FIG. 6.

INVENTOR.
Joseph J. Panik.

BY
Harniss, Dickey & Pierce.
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,495,128

HANDCAR-COASTER WAGON

Joseph J. Panik, Detroit, Mich.

Application May 29, 1947, Serial No. 751,435

9 Claims. (Cl. 280—247)

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The present invention relates to vehicles, particularly of the class adapted to be used as toys, and aims to provide an improved toy wagon construction incorporating novel propelling means.

An important object of the invention is to provide such a toy vehicle which resembles and may be used as an ordinary coaster wagon, but which also incorporates novel and highly efficient propelling means whereby the vehicle may be operated similarly to a handcar and propelled at considerable speed by a child sitting in the wagon.

Another object is to provide such a vehicle having a single handle at the front corresponding to the usual handle with which toy wagons are commonly provided, and which is similarly usable for pulling the wagon and for steering, the same handle being also usable, however, through the agency of mechanism of simple but effective character, to propel the vehicle after the fashion of a handcar when desired, by imparting a reciprocating or pumping movement to the handle.

Another important object of the present invention is to provide a toy vehicle of the class indicated which is adapted to be economically formed of sheet metal by quantity production methods, and which is of rugged construction and attractive appearance.

Still another object is to provide such a vehicle having propelling mechanism which is arranged to drive the front wheels of the vehicle and which is formed as a unitary assembly with the front wheel supporting means.

An object related to that last stated is to provide an improved unitary assembly for the front wheels of such a vehicle including a fifth-wheel mounting, a swivelling front wheel support carried by the fifth wheel mounting, such support being of the generally conventional inverted yoke type and incorporating a steering arm extending forwardly and upwardly from the swivelling wheel support for attachment of a combined steering and pulling handle, and propelling means also carried by the swivelling wheel support and adapted to be actuated by pumping movement of the handle in the manner previously indicated, all essential portions of said steering, supporting, and propelling means being readily accessible and replaceable for servicing and repair.

Another object is to provide an improved wheel supporting structure, particularly for toy vehicles.

Still another object is to provide an improved body and frame structure for toy vehicles and the like.

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Still another object is to provide an improved propelling system, particularly for such a toy vehicle, including a handle adapted to serve as actuating means for the propelling mechanism in the manner previously indicated, and also to serve as means for steering or for pulling the wagon in the usual manner, novel means being provided whereby the handle may be selectively coupled to or uncoupled from the propelling means.

Other objects and advantages will become apparent upon consideration of the present disclosure in its entirety.

In the drawings,

Fig. 1 is a side elevational view, partly broken away, of a toy vehicle constructed in accordance with the present invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a composite view partly in front elevation and partly in section, taken substantially as indicated by the line and arrows 3—3 of Fig. 2;

Fig. 4 is a cross-sectional view taken substantially on the line 4—4 of Fig. 2 and looking in the direction of the arrows;

Figs. 5 and 6 are sectional detailed views showing the parts in different operative positions, each view being taken substantially on the line 5—5 of Fig. 2 and looking in the direction of the arrows;

Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 1 and looking in the direction of the arrows; and

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 2 and looking in the direction of the arrows.

Referring now to the drawings, reference character 10 designates generally the sheet-metal body of the toy vehicle illustrated in the drawings as constituting a preferred embodiment of my present invention. The body may be in the form of an integral skirted pan formed of sheet metal by conventional drawing methods and including a substantially flat floor portion 12 formed with upwardly and outwardly inclined front and rear walls 13 and 14 respectively, and similarly formed left and right side walls as 15 and 16. To impart a pleasing appearance and to conceal and protect the supporting and operating mechanism, the body may be formed with an integral skirt which, except at the front of the vehicle, may extend downwardly to a point only slightly above the hubs of the wheels. The skirt portion is designated 18, and may be embossed outwardly over the wheels, as indicated at 20, to provide additional clearance for the wheels

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and to add a decorative effect, such embossments being preferably contoured to simulate the streamlined fenders of an automobile. At the front of the vehicle the skirt is somewhat cut away, as indicated at 22 to provide clearance for the front wheels and connected steerable portions during swiveling movements of the front wheels in steering.

The rear wheels of the vehicle, designated 24 and 25 are supported in a generally conventional manner upon a dead axle 26 carried in a yoke-like support of inverted U form and channeled cross section having a flat transverse upper portion 28 welded or otherwise rigidly attached to the bottom of the floor 12 of the body 10, and having downwardly projecting legs 30 and 31 provided with flanged openings as 32 formed in oppositely aligned positioning in and near their lower ends, through and from which openings the axle projects to support the wheels. The wheel-supporting yoke assembly is braced as by the angular metal strap 34 welded or otherwise rigidly attached to intermediate portions of the legs 30 and 31 and extending angularly upwardly and forwardly to the bottom of the floor 12 to which they are attached as by welding.

The supporting means for the front wheels also includes a yokelike support of substantially inverted U form, which is adapted to be drawn of sheet metal and is of deeper channeled section, having an integral flat upper portion corresponding to the bight of the U. Such flat portion forms the fifth wheel and is generally designated 35, being of circular outline, viewed in plan, centrally secured to the underside of and pivoted with respect to a fifth wheel plate 36 attached to the underside of the floor 12 at the front center portion thereof. The plate 36 extends forwardly to bridge the space between the front wall 13 and the inside of the skirt 18 and is downwardly flanged and secured to the skirt as by welding. The flanged portion of the fifth wheel plate is designated 37, and the arrangement of the plate will be seen to stiffen the entire front end of the body structure. A circular rib 38 is embossed in and projects downwardly from the plate 36, the rib being of U section, having a smoothly rounded bottom and being concentric with the pin 40 which pivotally secures the steering yoke assembly to the plate 36. Pivot pin 40 extends centrally through the plate and the flat top portion 35 of the yoke assembly, as well as through the floor 12 of the body. A circular central area 42 of the flat top section 35 of the yoke is embossed upwardly to a height corresponding to that of the bearing rib 38 to lie flat against the plate in the area through which the pin 40 extends. The bearing rib 38 is preferably of substantial diameter, providing a relatively wide fifth-wheel bearing, and the pin, smoothly rounded above the floor, may be secured at its lower end as by the conventional washer and cotter pin means generally designated 43.

Integral wheel-supporting legs 45 and 46 extend downwardly and outwardly from the fifth-wheel portion 35 and at their lower extremities support the live front axle 48. The free edges of the side webs of the channeled leg portions 45 and 46 are stiffened at their lower ends by cross-web portions 50 extending longitudinally of the vehicle, so that at its lower end each leg is of generally box form, spaced inner and outer walls being thereby constituted, which walls are provided with aligned axle openings (undesigned). Surrounding each such opening is an inset cir-

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cular embossment of partly toroidal form 51, 52 constituting a race for antifriction balls as 53.

A tubular bearing sleeve 55 is freely rotatable in the openings in the embossed portions 51 and 52. The bearing sleeve is outwardly flared at both ends, as indicated at 56, to define raceways adapted to coact with the raceway portions 51 and 52 to support and retain the balls 53 which in turn center and rotatably support the sleeve 55, providing an antifriction journal therefor at two well-spaced positions, as will be apparent. The axle shaft 48 may have an easy sliding fit within the sleeve 55, and at one end carries the wheel assembly 60 which is keyed to the shaft to rotate therewith. At its opposite extremity which extends through the leg 46 the shaft 48 is supported by similar antifriction bearing means, some of the corresponding parts of which are shown and designated by like reference characters distinguished by the addition of the letter "A" to each, but the wheel 62 carried by such opposite end of the shaft is rotatable with respect to the axle and may be constructed similarly to the rear wheels 24 and 25.

A channeled sheet metal cross brace 65 bridges the lower extremities of the legs 45 and 46 extending substantially parallel to and below the axle 48. Cross brace 65 is upturned at its ends and the upwardly directed portions of its bottom flange constitute the box web portion 50 previously referred to which carries the bearing means for the inner end of sleeve 55. The side web portions of the upturned ends of the channel 65 are welded to the inner walls of the side flanges of the channel-sectioned legs 45 and 46 as indicated at 67. The central portion of the cross bracing member 65 is pivotally connected at a point in vertical alignment with pivot pin 40 to a longitudinal bracing member 66 which extends angularly upwardly and rearwardly therefrom and is fixedly attached as by welding at its rear end to the underside of the floor 12. The pivotal connection between the bracing strap 66 and the cross brace 65 is provided by a pivot pin 45 68. This arrangement will be seen to permit free swinging movement of the yoke and front wheels during steering, while bracing the entire yoke and wheel assembly against unwanted angular movement toward the front or rear about a transverse axis.

An extension yoke portion 70 extends angularly forwardly and upwardly from the outer walls of the wheel-supporting leg portions 45 and 46, constituting an integral part of this sheet-metal assembly and tapering to narrower contour toward its front upper extremity. Extension yoke portion 70 may also be of channeled cross section for added rigidity and at its upper extremity is provided with bifurcated end portions, each of which is preferably of downwardly opening channeled form, such end portions being designated 72 and provided with aligned transverse openings (undesigned) for a pivot pin 74. Pivot pin 74 also extends through a forklike lower fitting 75 carried by a tubular handle 76, the upper extremity of which carries a closed or D-type hand-grip fitting 78. When the handle assembly extends angularly upwardly and rearwardly from the extremity of the yoke portion 70 as shown in Fig. 1 it may be used for steering in the usual manner by an occupant riding in the wagon, while it will be seen that the handle may be swung forwardly and used to pull the wagon, also in the usual manner.

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The handle is also equipped with coupling means whereby it may be connected to hand-car-type propelling means for turning the front axle and so driving the vehicle through the wheel 60. Such propelling means includes a pair of pulleys as 80 and 82, the former fast upon the axle 48 near the center and the latter carried by a shaft 84 rigidly supported by the left leg 45 of the front yoke assembly, as by means of a hangar bracket 85 welded to the back of leg 45 and projecting rearwardly therefrom. The shaft 84 may be fixedly mounted in the bracket, as by being welded thereto in the manner best indicated in Fig. 7, and projects inwardly therefrom to rotatably support the driving pulley 82. A crank pin 86 is rigidly attached to and projects from the free face of the pulley 82. Pitman rod 88 is pivotally connected to the crank pin 86 and extends forwardly between the legs of the yoke assembly to a point spaced below the pin, where it is pivotally connected to the lower end of an actuating arm 90 pivoted upon the pin 74 and extending downwardly therefrom. It will be seen that by rocking the arm 90 about the pivot pin 74 the pitman may be made to turn the driving pulley 82, and the vehicle may be driven through the agency of the belt 92 which connects the pulleys 82 and 80 and so causes the axle shaft 48 and wheel 60 to be turned in response to such movement of the arm 90. The handle 76 is adapted to be selectively connected to the arm 90 by clutching means presently to be described, so that by rocking the handle up and down, the above-described movement may be imparted to the arm 90 to propel the wagon.

A notch 94 is formed in the upper extremity of the arm 90, between the supporting portions 72 of the extension yoke portion 70, in a position to be engaged by a cross pin 95 carried by the lower end of a plunger 96 slidable within the tubular handle 76. As shown in the drawing, the arm 90 may be formed of two laterally spaced sheet-metal sections for added strength, and the opening (undesigned) therein through which the pin 76 extends may be located off-center, as shown in Figs. 5 and 6, to provide added material and a greater radius at the portion of the arm containing the notch 94, which is of course formed in both sections. The portion of the plunger 96 which carries the pin 95 projects between the two sections of arm 90, the pin 95 projecting from both sides of the plunger, so that the correspondingly notched portions 94 of the two arm sections 90 are both engaged by the pin 95. A rod 98 is attached to the plunger 96 as by welding and extends upwardly through and from the upper end of the handle tube 76. Rod 98 carries a finger ring 100 rigidly attached thereto and exposed and accessible within the D-shaped hand-grip portion 78 so that the ring may be easily manipulated by one finger while the handle is grasped. It will be seen that when the ring, rod, and plunger portion 96 are at the lower extreme of their movement, the pin 95 engaging in the slotted portion 94 clutches the handle assembly 76 to the arm 90 so that by pumping action of the entire handle about the axis of the pin 74 the vehicle may be propelled in the manner described. When the ring 100 is pulled upwardly, the pin 95 is freed from the notched portions 94 and the wagon may be steered by an occupant, as for example while coasting, without the rotation of the front wheels imparting reciprocating movement to the handle, as will be apparent.

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The slidable plunger is urged downwardly by a coil compression spring 134 fitted on the rod within the tube and acting downwardly upon plunger 96 while reacting upwardly against a suitable U-shaped spring retainer clip as 135 carried by and projecting through and across the interior of the handle tube on either side of rod 98. When the slidable parts are in their lowered positioning in which the handle assembly is clutched to driving arm assembly 90, the ring 100 lies in diametric slot portions 138 formed in the upper extremity of the handle tube, as shown in Fig. 8 in full lines. When the ring is pulled up to declutch the handle, the ring may be turned 90° to lie across the higher, unslotted end portion of the handle tube which then by holding the ring and plunger assembly retracted, keeps the handle declutched without requiring the rider to hold on to the ring, as shown in dotted lines in Fig. 8. It will be noted that clutch pin 95 is free to turn with the rod and plunger when the parts are pulled up, while the slot portions 138 realign the plunger and rod assembly so that the clutch pin will enter slot 94 when the ring is so turned as to permit reclutching.

Referring to the construction of the two rear wheels and the front wheel 62, it will be seen that each such wheel comprises a pair of identical pressed sheet-metal disks as 102 and 103, the two disks having annular flat web portions generally designated 104, adapted to lie against and to be welded to one another, as by spot welding. The peripheral portions of the disks surrounding the web portions 104 are outwardly flanged as indicated at 105 to define a partly toroidal tire-supporting rim channel. The portion of each disk lying within the flat web section 104 is outwardly convexed so that the central area of the assembled wheel disks is lenticular and adapted to support the axially spaced bearing outer race portions 106. The race portions 106 are formed by integral inwardly embossed partly toroidal areas provided with central apertures 107 extending through the race-defining portions 106 and of sufficient size to provide clearance for free rotation of the wheel with respect to a sleeve 108 which extends through both disk portions and somewhat beyond the race-forming portions 106. The ends of the sleeve 108 are outwardly flanged, as indicated at 110, to form the inner races for a series of balls 112, and such outwardly flanged portions may also be of partly toroidal form and concentric with a circular line drawn through the centers of the balls 112 which are trapped between the flanged race-defining portions 106 and 110 and serve to journal the wheel on the sleeve. This arrangement will be seen to correspond generally to that described in connection with the mounting of the supporting sleeve 55 for the line front axle, although it will be noted that in the front arrangement the sleeve 55 is journaled.

A suitable tire, as 114, is shown mounted in the rim channel portions 105, and this may be formed of soft rubber and provided with a softer core as 115 of sponge rubber or the like if desired. It will be appreciated that in assembling the wheel disks the annular flat web portions 114 may be welded together with the assembled tire in place, the tire being constructed as a pre-formed annulus. A separate tire-applying operation such as is now required is thereby eliminated. The ball-race flanges 106 are also preformed in drawing the wheel disks, and one of the end flanges 110 of the bearing sleeve 108 may also

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be preformed, the other extremity of the sleeve being left straight and flanged over, as by spinning, after the balls are in place. The wheel thus constitutes a completely self-contained unit which may be slid on and off the projecting end of the axle, and may be constructed at such low cost as to be readily replaceable at literally no more expense than is involved in changing or replacing the tires of conventional ball-bearing wheels as commonly constructed for use upon wheeled toys. The wheel is shown as retained upon the end of the axle by a conventional cotter pin and washer assembly generally designated 116 over which a sheet-metal hub cap as 118 is fitted.

As previously indicated, the left front wheel 60 may differ from the other three wheels of the vehicle, since it is the driving wheel, by the inclusion of means for keying it to the end of the front axle shaft 48, which is indicated at 120, as squared for the purpose. In forming the driving wheel, although the wheel disks are essentially similar in their contour and mode of assembly, the central apertured portion of each disk, instead of the race portion 106 and circular opening 107, is formed with a squared opening adapted to snugly fit the squared shaft portion 120, the opening, which is not designated by a reference character, being surrounded by an inwardly directed flange 122 which increases the interengaging load-supporting surface areas of the wheel and squared shaft portion. The wheel may in other respects be constructed similarly to the other wheels as previously indicated and may likewise be retained by cotter pin means as 123.

It will be apparent that the invention is subject to variation and modification without departing from the scope intended to be covered by and fairly ascribable to the subjoined claims. I claim:

1. In a vehicle of the character described including body means adapted to carry a load and front and rear wheels supported by and adapted to carry the body means, steerable front wheel supporting means, and means for imparting a drive to a front wheel to propel the vehicle, comprising an axle supporting structure, pivotal connecting means attaching said structure to said body means for swiveling movement about a substantially vertical axis for steering, an axle carried by said structure, a handle supporting portion also carried by said structure, a handle pivotally connected to said handle supporting portion for swinging movement about a substantially horizontal axis, said handle being held against swinging movement with respect to said extension about an axis parallel to the steering axis, whereby the handle may be moved laterally to swing said structure about said steering axis, and driving means for turning said front wheel to propel the vehicle in response to swinging movement of said handle about said horizontal axis, said driving means including a crank, a driving arm for said crank, and a clutch for selectively connecting said handle to and disconnecting it from said driving arm.

2. Means as set forth in claim 1 in which said clutch includes a member movable to and from engagement with said arm, and clutch operating means extending upwardly along the handle and manipulatable from a position remote from said substantially horizontal axis.

3. Means as set forth in claim 1 in which said structure comprises a yoke assembly of generally inverted U form, said driving means including

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driving and driven members carried by said yoke assembly and connected to said drivable front wheel, said handle and arm also being carried by said yoke assembly.

4. In a vehicle of the character described having a body and front and rear wheels, a structure for steerably supporting the front wheels and for propelling the vehicle comprising an axle support having steering bearing portion adapted to be pivotally secured to the body for swinging movement about a steering axis, laterally spaced side portions rigidly secured to and projecting downwardly from said steering bearing portion, a live axle journaled in said side portions and adapted to carry the wheels for bodily swinging movement with said support during steering movement, a handle connecting portion carried by said support and rigidly secured thereto for movement as a unit therewith, substantially horizontal pivot means carried by said handle connecting portion, a handle carried by and swingable about said pivot means, and means for rotating said axle in response to swinging movement of the axle about said pivot means, including a crank, an actuating member rockable about said pivot means for turning the crank and the axle, and means including a clutch for selectively connecting and disconnecting the handle with respect to said actuating member.

5. In combination with means as set forth in claim 4, actuating means for said clutch extending longitudinally of the handle and adapted to be operated from a point remote from the pivot means.

6. In combination with means as set forth in claim 1, a rotatable driven element fast with respect to said drivable front wheel, and a driving element coupled to the driven element and rotatably carried by said supporting structure, said crank means being connected to said driving element.

7. Means as set forth in claim 1 including a driven pulley fast with respect to said drivable front wheel, a driving pulley rotatably supported by and bodily swingable with said supporting structure and lying in a plane substantially parallel to the driven pulley, belt means joining said pulleys, said crank being connected to said driving pulley, said actuating member comprising an arm swingable about said pivot means, and a pitman joining said arm and said crank, said clutch comprising a member adapted to selectively couple or uncouple said arm and handle.

8. A vehicle construction of the character described including a body and front and rear wheels, and combined front wheel-suspending and vehicle-propelling means including an axle supporting structure, steering pivot means connecting said structure to the body for pivotal movement about a substantially vertical steering axis, wheel-supporting side portions extending downwardly from said steering pivot means, a wheel-supporting live axle journaled in said side portions, and combined steering and propelling means for turning said structure about said steering axis and for rotating the axle to turn a wheel keyed thereto, including a crank for rotating said axle, a handle pivoted to said structure for swinging movement about a substantially horizontal axis but held against unwanted turning with respect to the steering axis, and means connecting said handle to said crank including a rod member for imparting rotary movement to said crank in response to swinging movement of the handle about said horizontal axis, whereby the vehicle may be

propelled, the vehicle being steerable by swinging movement of the handle about said first-mentioned steering axis to impart corresponding steering movement to said structure and to the wheels carried by said axle.

9. A vehicle construction as set forth in claim 8 including an arm swingable about said same horizontal axis and means movable to and from interengaged relation with respect to said arm to selectively couple the handle to the arm.

JOSEPH J. PANIK.

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