United States Patent

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[72] Inventors **Ronald R. Pauly**
Mound;
Thomas W. Good, Plymouth, both of,
Minn.

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[73] Assignee **Tonka Corporation**
Mound, Minn.

[54] **AXLE MOUNTING FOR TOY ARTICLES**
4 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **46/221,** 46/223
[51] **Int. Cl.** **A63h 17/26**
[50] **Field of Search** 46/221, 201, 202

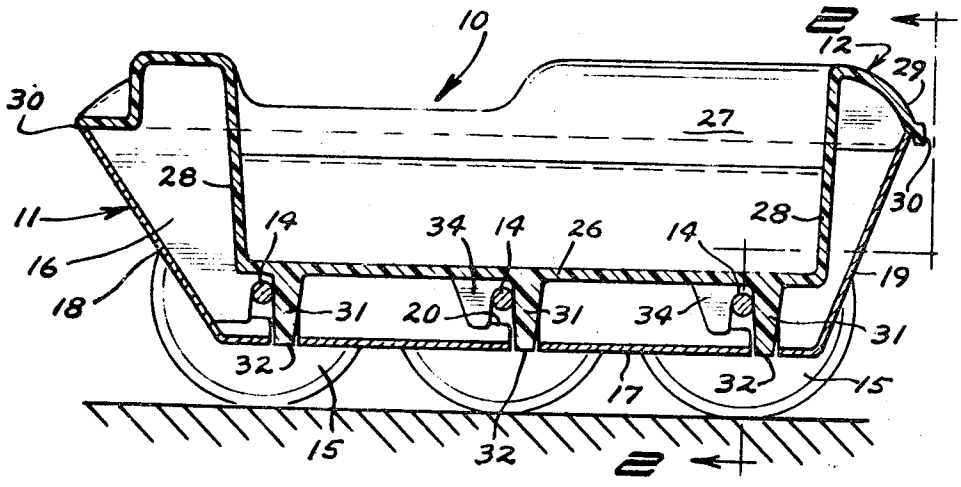
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Primary Examiner—Louis G. Mancene
Assistant Examiner—D. L. Weinhold
Attorney—Carlsen, Carlsen and Sturn

ABSTRACT: An axle mounting for a toy vehicle wherein the vehicle chassis is provided with transversely aligned downwardly opening notches having their upper closed ends offset from the open ends, an axle disposed across the chassis with its end portions seated in the upper ends of the notches, and a body member in the chassis above said notches and having a rigid projection depending vertically in alignment with the open ends of the notches and downwardly to the horizontal plane thereof to engage and retain the axle in its seated position.



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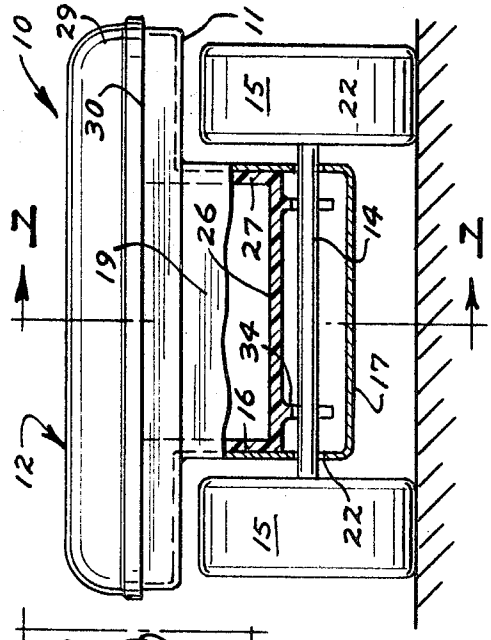


FIG. 2

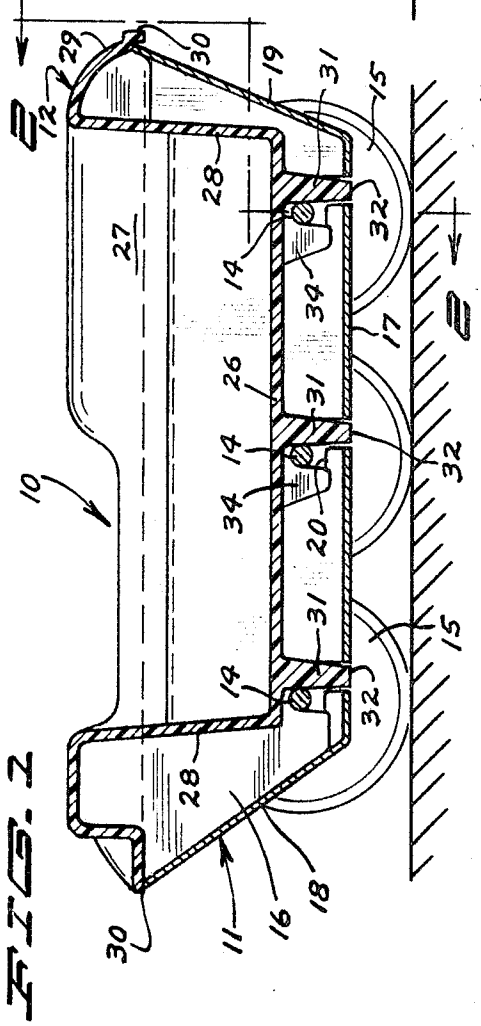
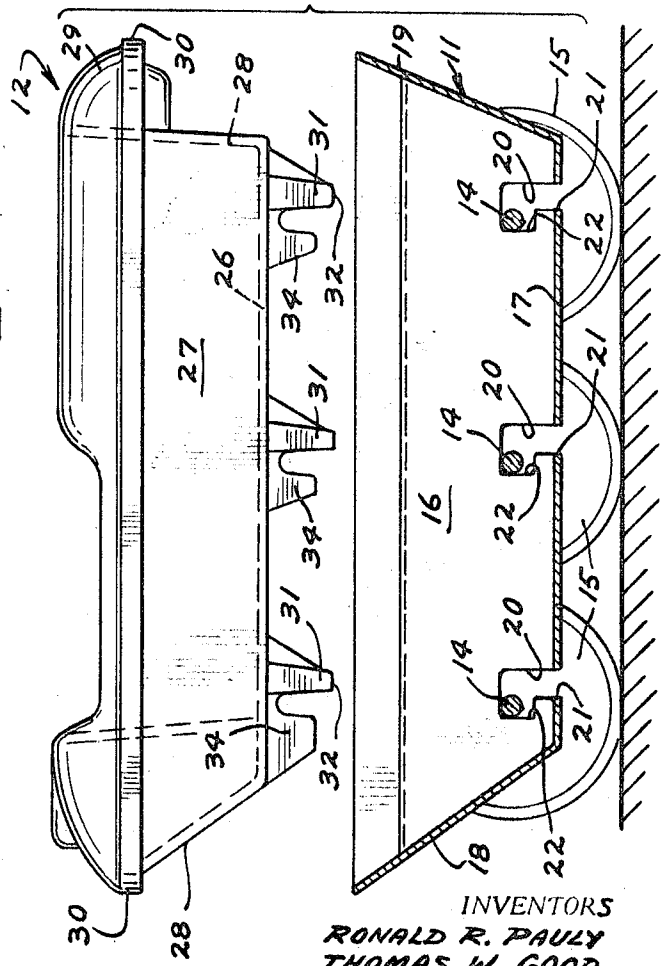


FIG. 3



INVENTORS
RONALD R. PAULY
THOMAS W. GOOD
BY
Carlsen, Carlsen & Sturm
ATTORNEYS

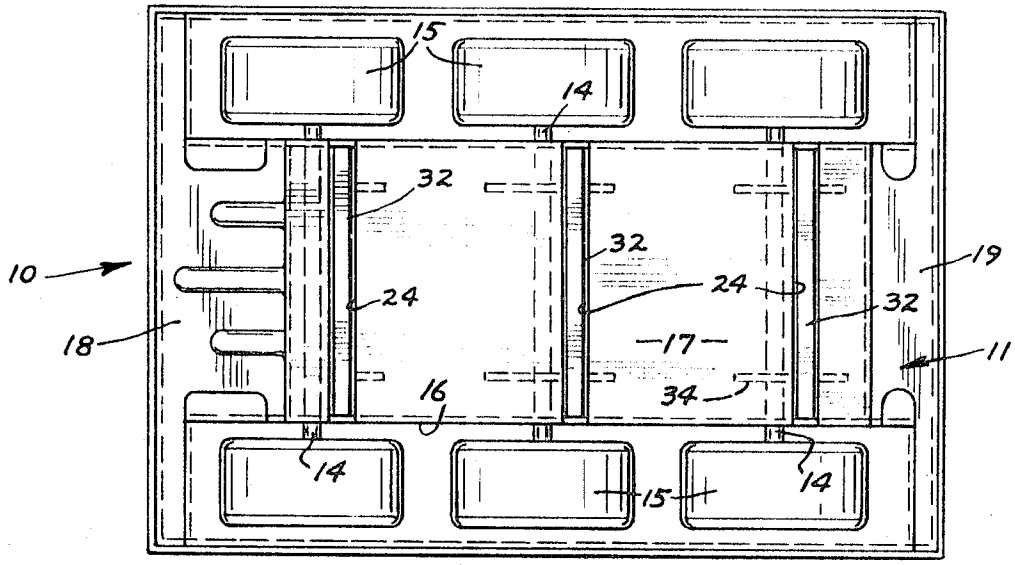


FIG. 4

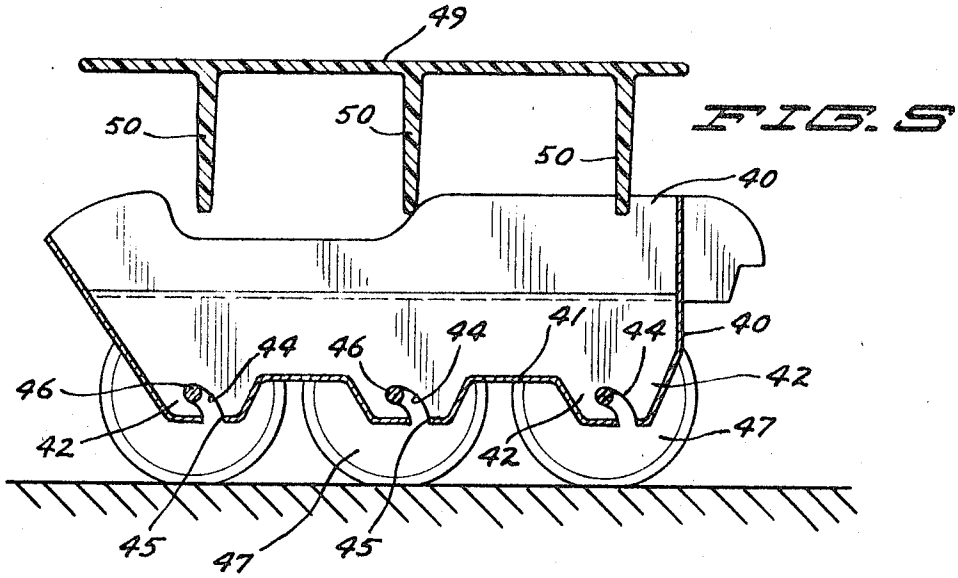


FIG. 5

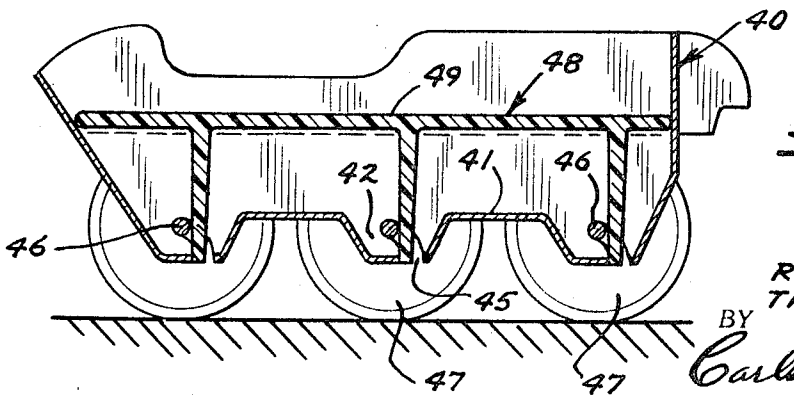


FIG. 6

INVENTORS
RONALD R. PAULY
THOMAS W. GOOD
BY
Carlsen, Carlsen & Sturm
ATTORNEYS

AXLE MOUNTING FOR TOY ARTICLES

In the manufacture of toy vehicles the manufacturers are constantly looking for economies in the assembly operation as well as durability. One time-consuming step involves the mounting of the wheels on the toy. This has conventionally entailed providing transversely aligned apertures in the vehicle chassis, inserting an axle through the apertures and then mounting the wheels on the ends of the axle. An alternate method frequently used involves forming the chassis with transversely aligned downwardly opening slots having tabs appended nearby, inserting the wheel-axle assembly into the slots and then bending the tabs over to close the open ends of the slots to hold the axle therein. The latter method permits preassembly of the wheels and axle but, of course, requires the bending operation at each slot and results in a construction having a plurality of undesirable exposed metal edges and which is subject to ready breakage.

The object of the present invention is to provide a toy vehicle construction wherein the vehicle chassis has axle receiving slots which are closed by portions of the body member when the body and chassis are assembled to secure an axle in the slots.

Another object of the invention is to provide an axle mounting for toy vehicles which leaves the underside of the vehicle chassis smooth and free of undesirable sharp edges and protrusions.

With these objects in view the invention broadly comprises a chassis having one or more pairs of downwardly opening slots, the slots in each pair being transversely aligned in the longitudinally extending sidewalls of the chassis and having their upper ends offset in a longitudinal direction from their open ends, an axle extending transversely of the chassis between each pair of notches with the end portions of the axle seated in the upper ends of the notches, and a body member fitting downwardly within the chassis and having a rib projecting downwardly to and in transverse alignment with the open ends of each pair of notches to retain the axle in seated position.

The above mentioned and additional objects of the invention will be brought to light during the course of the following specification, reference being made to the accompanying drawings, in which:

FIG. 1 is a longitudinal vertical section through one embodiment of the invention with the vehicle components in assembled condition.

FIG. 2 is an end elevation taken on line 2–2 of FIG. 1 and showing the chassis and body partially in transverse vertical section.

FIG. 3 is an exploded view prior to assembly of the chassis and body members with the chassis being shown in longitudinal vertical section as in FIG. 1 and with the body shown in side elevation.

FIG. 4 is an inverted plan view of the embodiment shown in FIG. 1.

FIG. 5 is a longitudinal vertical section through a second embodiment of the invention with the body and chassis in preassembly positions.

FIG. 6 is similar to FIG. 5 with the body and chassis assembled.

Referring now more particularly to the drawings, reference characters will be used to denote like parts or structural features in the different views. The toy vehicle denoted generally at **10** in FIGS. 1 to 4 is made up of a chassis **11**, a body member **12**, and one or more wheel and axle assemblies each comprising an axle **14** having a wheel **15** mounted on each end. Chassis **11** is preferably formed of sheet metal material and has an upwardly opening panlike configuration with transversely spaced stepped sidewalls **16** extending upwardly from a bottom wall **17** and interconnected by upwardly diverging end walls **18** and **19**.

The sidewalls **16** are provided with transversely aligned and coextensive inverted L-shaped notches **20** (FIG. 3) which open downwardly from the bottom edges of the walls as at **21** and which have their upper closed ends **22** longitudinally offset from the openings **21**. There is a pair of these notches for reception of each axle **14** on the vehicle. Bottom wall **17** has a slot **24** (FIG. 4) extending transversely thereacross connecting the open ends **21** of each pair of notches. The upper closed end portion **22** of each notch is of sufficient size to receive the axle **14** is a completely offset position from the slot **24** in a direction longitudinally of the vehicle leaving the slot completely exposed from above.

The body member **12** is unitary and preferably, though not necessarily, formed of molded plastic. It has a containerlike configuration with a bottom wall **26** and sidewalls **27** and end walls **28** surrounded by a rim **29** having a peripheral lip **30** adapted to seat upon and continuously engage the upper edges of chassis walls **16**, **18** and **19** to which it is suitably secured by adhesive or the like.

A plurality of ribs **31** project downwardly in longitudinally spaced relation from the bottom wall **26** extending transversely thereacross one in vertical alignment with each of the slots **24** in the bottom wall **17** of the chassis. The ends of these ribs **31** are designed to fit within and substantially fill the slots **24** when the lip **30** is seated upon the top edges of the chassis so that the end surfaces **32** of the ribs are flush with the bottom surface of wall **17**. A pair of hook portions **34** project downwardly in longitudinally spaced relation to each rib **32**. These serve as bearing members for the top side of the axle **17**.

In assembling the vehicle the chassis **11** is supported in inverted position with the notches **20** up. Axles **14** with the wheels **15** mounted thereon are dropped through slots **24** with one wheel on each side of the chassis. With the chassis tilted so that the axles are at rest in the closed end portions **22** of the notches, the chassis is lowered onto the inverted body member **12** until the ribs **31** enter the slots **24**. As the lip **30** engages the edges of the chassis walls the rib end faces **32** will be flush with the outer surface of wall **17** and ribs **31** will lock axles **14** in the notch portions **22**. When turned to an upright position the inner arches of the hook portions **34** will project slightly below the upper edges of notch portions **22** to serve as bearings for the axles.

A slightly modified and simplified form of the invention is shown in FIGS. **5** and **6**. Here the chassis **40** has the same general panlike configuration as chassis **11**. However, the bottom wall **41** has an irregular configuration to provide an appearance of axle housing **42** extending across the bottom of the chassis. The chassis sidewalls are provided with transversely aligned and coextensive downwardly opening notches **44** which are similar to notches **20** of the first embodiment except that they are arcuate rather than L-shaped. The numeral **45** denotes the open ends of the notches and a slot extending transversely across the bottom wall **41** connecting the open ends in each pair thereof. Axles **46** have wheels **47** mounted at each end.

An insertable body member **48** corresponding to the body **12** of the first embodiment has a flat plate **49** adapted to fit downwardly and seat within chassis **40** and a plurality of depending transversely extending vertical ribs **50** adapted to project downwardly one into each slot **45** to hold axles **46** in the upper ends thereof. It will be understood that the notches **44** may be angular as well as arcuate. The important feature is that the upper ends of the notches receiving the axles **46** be longitudinally offset from the open ends **45** of the notches. The assembly of this form of the invention is the same as with the first embodiment.

Having now therefore fully illustrated and described the invention, what we claim to be new and desire to protect by United States Letters Patent is:

1. In a toy vehicle, a chassis member having a pair of transversely spaced longitudinally extending sidewalls, said walls having transversely aligned notches extending upwardly from the bottom edges of the wall with the upper ends of such

notches offset longitudinally from the bottom open ends thereof, a wheel axle seated in the said upper ends of said notches, and a body member disposed between said sidewalls and affixed to the chassis and having a rigid projection in vertical alignment with the open ends of the notches and extending downwardly to approximately the horizontal plane thereof to retain the axle in said upper ends of the notches against removal through the open ends thereof.

2. The subject matter of claim 1 wherein said sidewalls are interconnected by a bottom wall, said bottom wall having a slot extending transversely thereacross interconnecting the

open ends of the notches to allow insertion of the axle into the upper ends of the notches prior to mounting the body member in the chassis.

3. The subject matter of claim 2 wherein said projection extends transversely the full distance between said sidewalls and fits within said slot to form a smooth bottom surface to the bottom of the chassis.

4. The subject matter of claim 1 wherein said notches have an inverted L-shape with the upper leg thereof forming the closed end of the notch.