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Terzian

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[54] **INERTIA TOY**

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[51] **Int. Cl.** **A63l 11/10**

[58] **Field of Search** 46/202, 206, 209, 46/47, 59, 60–66, 71, 69, 82–85

[56] **References Cited**

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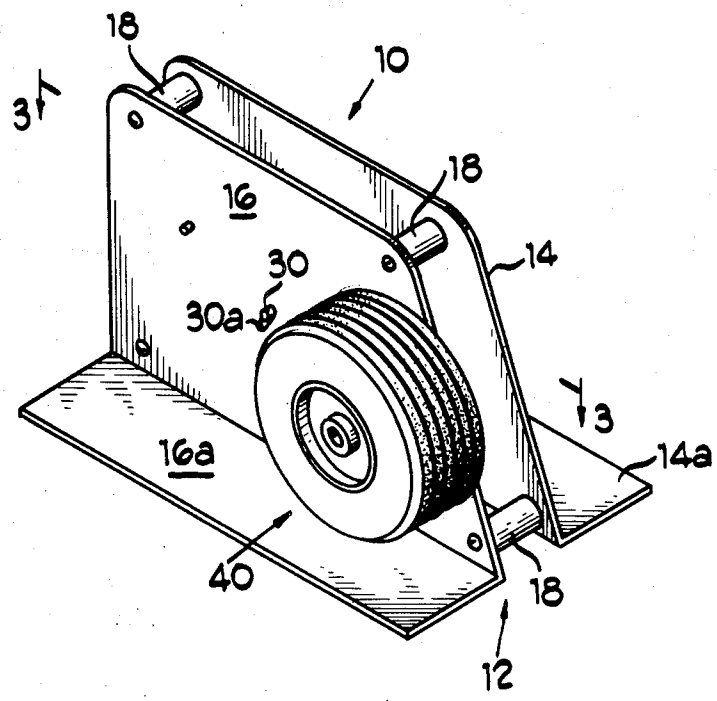
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[57] **ABSTRACT**

A launching and racing type toy characterized by the provision of a frame having a crank arm, intermediate gears and a driven rotatable spindle having a threaded portion thereon; and a wheel having a threaded interior for mating with the spindle thread.

5 Claims, 5 Drawing Figures



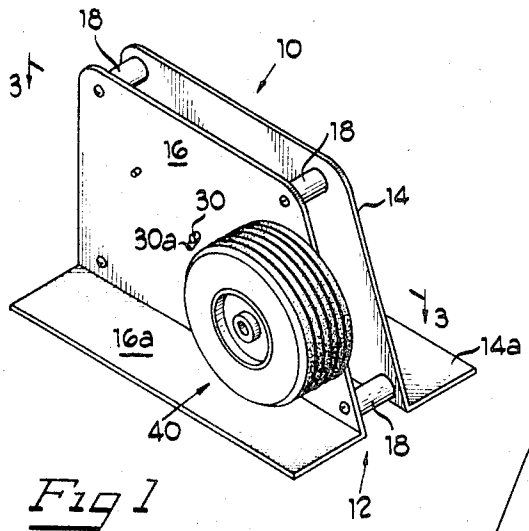


Fig 1

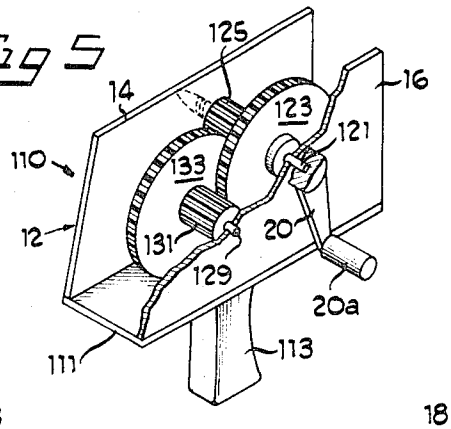


Fig 5

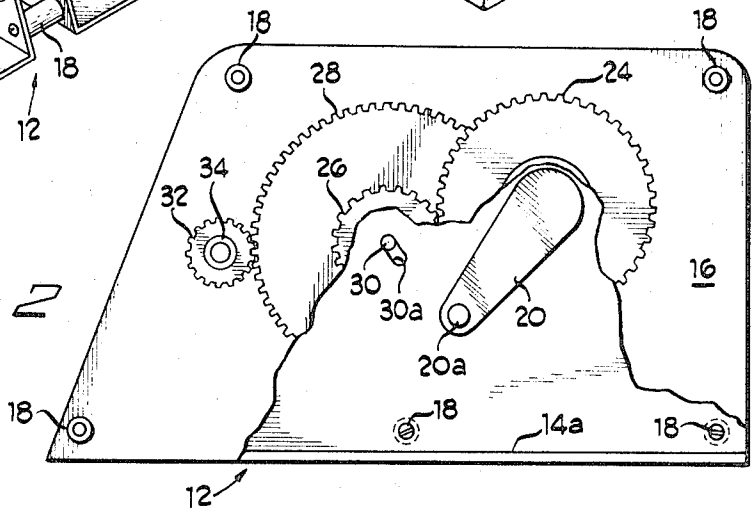


Fig 2

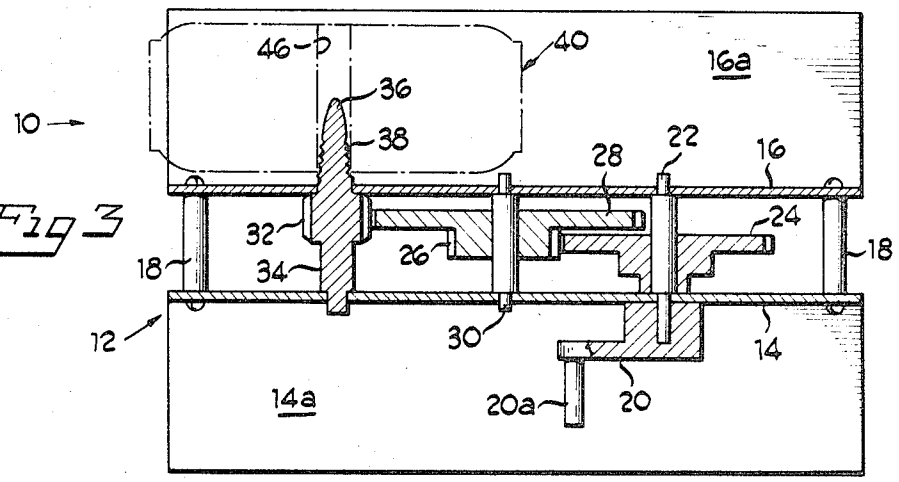
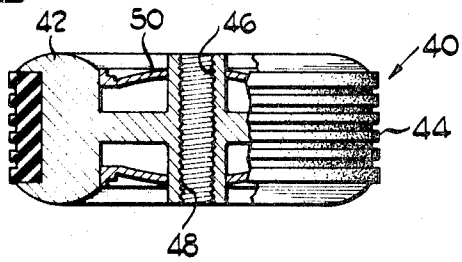


Fig 3

Fig 4



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INERTIA TOY

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to toy devices and more particularly to an inertia type toy.

2. Brief Description of the Prior Art

There are different forms of inertia toys which operate, or have portions which operate, on the release of energy resultant from the stored momentum imparted to a component. Generally speaking, this is accomplished by rotating a member at a high rate of speed and then allowing the member to release its stored momentum.

These toys are well received in that they are simple in structure and operation and dramatic in operation. It is the object of this invention to meet the continuing need and desire in the art for improved forms of these toys.

SUMMARY OF THE INVENTION

This invention is directed, in brief, to the provision of an improved inertia type toy.

The best mode currently contemplated for carrying out the invention includes the provision of a frame rotatably supporting a crank arm which is connected to a gear train for driving the same responsive to rotation of the crank arm. The gear train rotatably drives a spindle which is threaded to receive the threaded bore of a wheel.

After the wheel has been threaded onto the spindle, the crank arm may be rotated to build up momentum in the wheel. When the crank arm is suddenly stopped, the wheel will unthread from the spindle, engage a supporting surface, and roll at a rapid rate of speed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the preferred embodiment of the toy of this invention;

FIG. 2 is a side elevational view, partially broken away in section, of the toy of this invention;

FIG. 3 is a section view taken generally along the line 3—3 of FIG. 1;

FIG. 4 is a view, partially broken away in section, of the wheel utilized as a part of the toy of this invention; and

FIG. 5 is a perspective view of an alternate form of the toys of this invention.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a specific embodiment therefor, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

The toy device of this invention is provided with means of defining a frame **12.** In the preferred embodiment the frame is comprised of a pair of plates **14, 16,** preferably made of a suitable rigid material, such as metal, plastic or the like. Each plate **14** and **16** has outwardly extending transverse flanges **14***a* and **16***a* at the bottom thereof providing a stabilizing supporting surface for the frame **12.** The plates **14** and **16** are held together by fasteners and spacers, generally designated **18,** to assemble the plates together as a unit.

The toy of this invention includes a crank means, preferably comprised of a crank arm **20,** having a rotatable handle **20***a*. Crank arm **20** is connected to a shaft **22** which is rotatably supported in the frame between plates **14** and **16** for rotation of the shaft as the handle **20***a* is pulled through a circular path of travel in a well known manner. Crank shaft **22** supports a gear **24** which is part of a means for transferring power from the crank means and is in engagement with the toothed hub **26** of gear **28.**

Gear **28** is rotatably supported on shaft **30** which is positioned in slots **30a** in each of the frame members **16** and **14** for limited movement of the shaft relative to the slot, while permitting rotation of the gear **28.** Gear **28** in meshing engagement with toothed hub **32** of rotatable spindle **34** which is rotatably journalled between the plates **14** and **16** of the frame **12.**

Spindle **34** includes a projectile securement portion **36** which extends outwardly from one side of the frame, such as beyond the plate **16** as best seen in FIG. **3.** The projectile securement portion has a first coupling surface or threaded portion **38** thereon for releasably receiving a rotatable projectile, here shown in the form of a wheel **40.**

The rotatable projectile or wheel **40** includes a body portion **42** which supports a simulated tire thread **44.** The body **44** has a bore **46** centrally therethrough with a bore being of a size and shape to receive the spindle **34.** The bore **46** is provided with a second coupling surface or threaded interior **48** for threaded engagement with the threads **38** of spindle **34.** The body **42** also includes a rim area **50** which may receive different decorative hub caps to change the appearance of the wheel.

In operation, the wheel **40** is threaded on the portion **38** of spindle **34.** Preferably, the threaded portion **38** of spindle **34** has only a few threads so that the coupling of the wheel relative to the spindle, as well as the uncoupling thereof, may be accomplished in a very few revolutions. The crank then is rotated, and, through the power transfer means or gear train, momentum is built up in the wheel **40.** When the crank is rotated clockwise, the shaft **30***a* will rise in the slot **30** so as to maintain the gear **28** in engagement with the gear **32.** Once the cranking motion is suddenly terminated, the shaft **30** will drop in slot **30a** so that gear **28** moves out of engagement with the spindle **34.** At the same time the relatively sudden cessation of power applied with spindle **34** will cause the wheel **40** to unwind from the spindle **34.** Once the wheel has unwound from the spindle and moved laterally relative thereto, it will engage the supporting surface and, under the impetus of its own inertia, become a free rolling body and will roll for a considerable distance before stopping.

In FIG. **5** there is shown a modified form of this invention which is similar to that shown in FIGS. **1** through **4.** The modified form **110** again includes a frame **12** which is comprised of spaced apart plates **14** and **16** which, however, lack the flanges **14***a* and **16***a*. Instead, the plates **14** and **16** are spanned by a bottom panel **111** which supports a depending handle **113.** The The modified form **110** also includes a crank means including a crank arm **20** having a rotatable handle **20***a* with the crank arm **20** being mounted to a rotatable shaft **121** which supports a gear **123** and toothed hub **125.** Gear **123** is in meshing engagement with a toothed

hub **131** supported on rotatable shafts **129** and hub **131** is part of gear **133** which is in meshing engagement with the gear **125.** The spindle arrangement and its mounting with respect to the wheel **40** is substantially the same as that described with respect to FIGS. **1** through **4** and thus, the operation is similar. Again, the wheel **40** is coupled on the spindle **34** and the crank **20** is rotated to build a momentum in the wheel. A sudden cessation of the cranking motion causes the wheel **40** to unwind from the spindle and move laterally away from the frame **12,** following which it will drop to a supporting surface, under the impetus of its own rolling momentum, which will cause it to roll a substantial distance.

Thus, it can be seen that the toy device of this invention provides a novel concept in inertial launching toys. The structure is simple in operation as well as construction, making it easily understandable and durable in use. It may be easily carried about from place to place and utilized in outdoor environments as well as interior environments.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as some modifications may be obvious to those skilled in the art.

I claim:

1. An inertia toy apparatus, comprising: means defining a supporting housing said housing having a pair of spaced apart supporting upright members; a wheel supporting spindle rotatably mounted generally transversely between said upright members thereby providing an axis arranged for horizontal disposition relative a tracking surface, said spindle being rotably mounted in said housing and having a driving surface thereon for rotating the spindle; a wheel releasably mounted on said spindle; a driven train in said housing and connected with said wheel supporting spindle for driving the same; a driving member cooperating with the drive train for imparting movement to the drive train to rotate said spindle; locking means releasably securing the wheel against axial dislodgement from the spindle including a locking surface on said wheel and a locking member cooperating with said wheel supporting spindle for cooperating with said wheel locking surface to releasably secure the wheel on said spindle, said locking means being releasable responsive to the termination of driving forces from said driving member to release the mutual engagement of the components thereof and permit release of the wheel from the spindle responsive to the stored momentum resultant from rotation of said spindle whereby said wheel may move axially off the generally horizontally disposed spindle and drop to a tracking surface and roll therealong.

2. The toy of claim **1** wherein the driven train and driving member comprises a gear train and a manually movable arm having gear teeth in engagement with the gear train.

3. The toy of claim **2** wherein one gear of the train is movable out of engagement with other gears responsive to termination of driving by the arm.

4. The toy of claim **1** wherein the locking means includes surfaces generally radially arranged relative to the axis of said spindle.

5. The toy of claim **4** wherein the locking surfaces include a threaded bore of the wheel and complementary exterior thread on the spindle.

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