Nov. 28, 1961 G. TOMOSY 3,010,729

TOY WALKING FOUR LEGGED ANIMAL

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FIG. 1

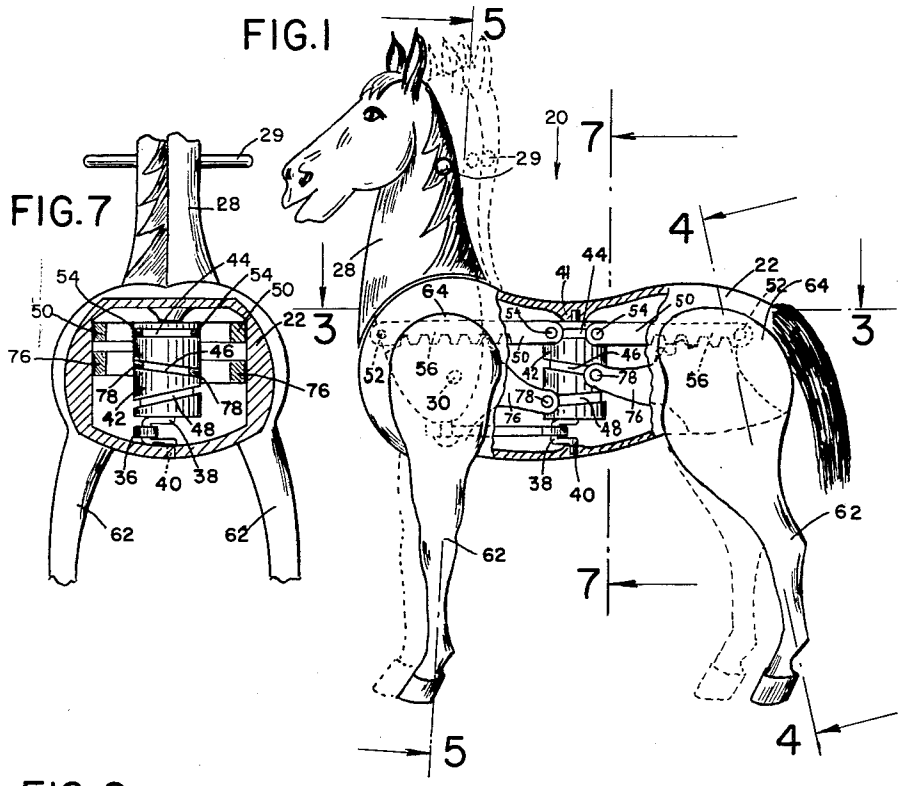


FIG. 7

FIG. 2

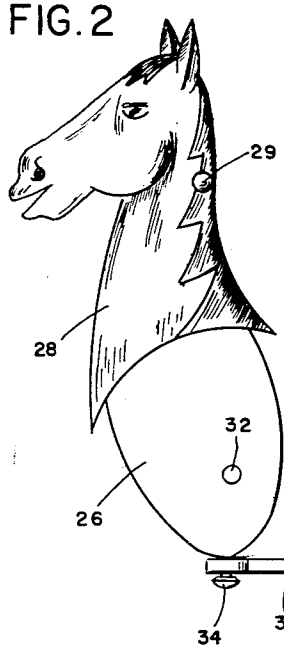
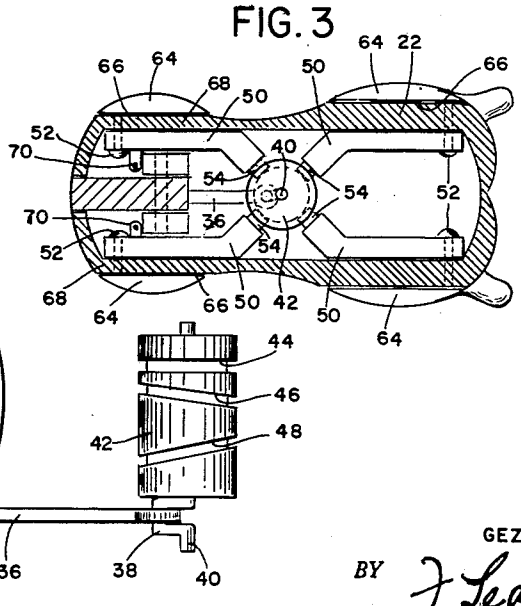


FIG. 3



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FIG.5

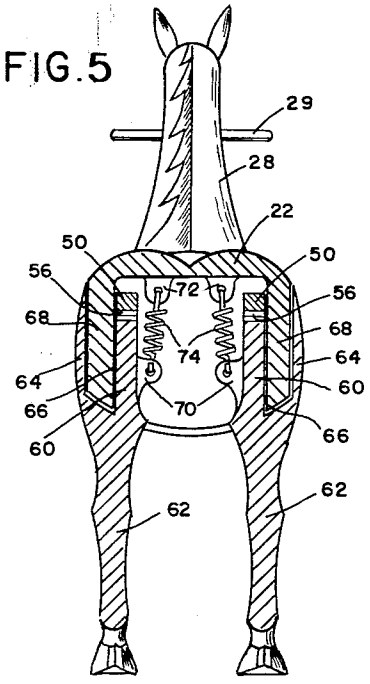


FIG.4

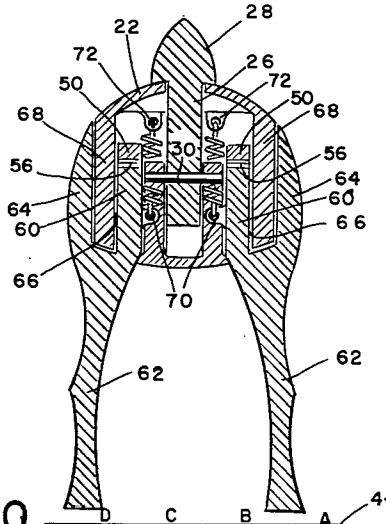


FIG.10

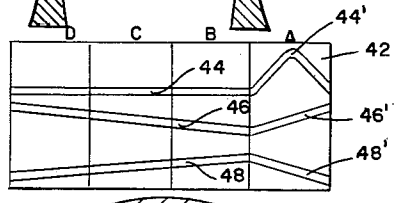


FIG.9

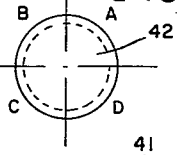
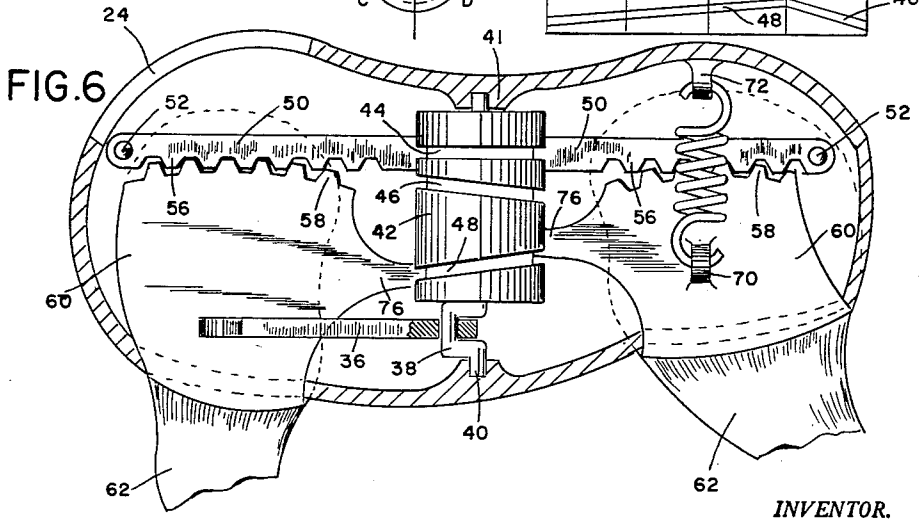


FIG.6



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FIG. 11

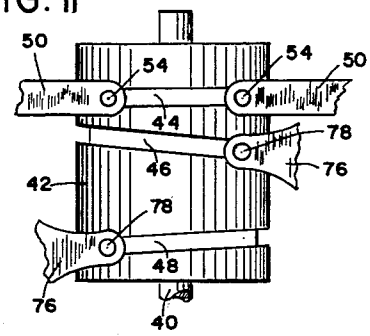


FIG. 12

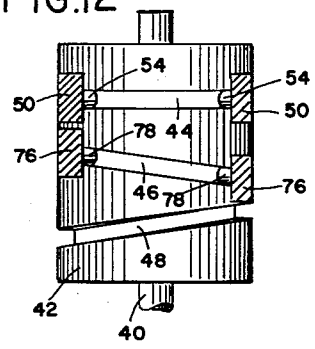


FIG. 13

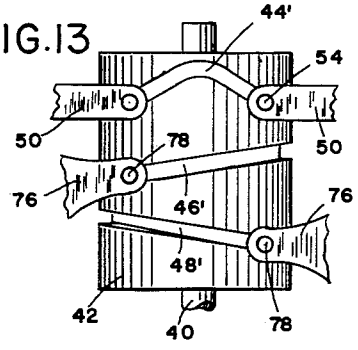


FIG. 14

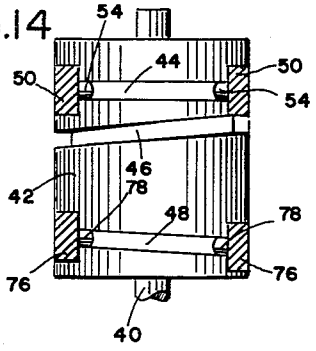
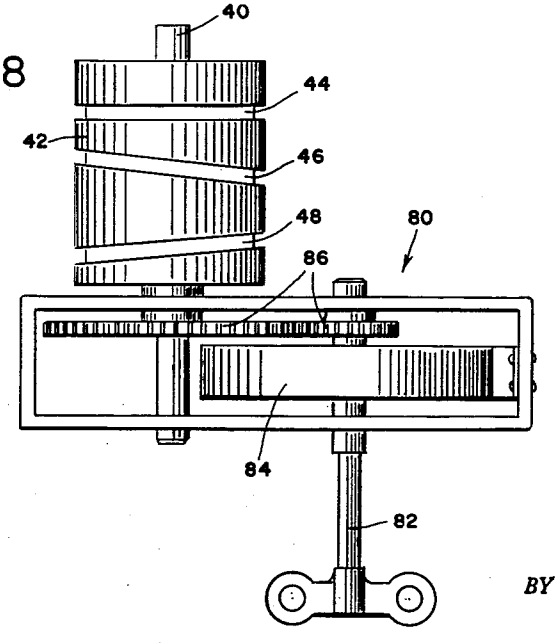


FIG. 8



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3,010,729

TOY WALKING FOUR LEGGED ANIMAL

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Filed Apr. 6, 1960, Ser. No. 20,346
6 Claims. (Cl. 280—1.181)

This invention relates to toys and, more particularly, to an articulated four legged toy animal.

Toy animals are usually the favorite toys of children, especially animals which are large enough for the children to sit upon. It is therefore an object of the present invention to provide a walking four legged toy animal which is of a size sufficiently large for a child to sit thereupon in a conventional riding posture and which is provided with means for moving the legs in a realistic manner in response to actuation of connecting linkage by the child.

Still a further object of the present invention is to provide a walking four legged toy animal having its head pivoted on a horizontal axis and an operating mechanism drivingly connected to the pivot head thereof and the articulated legs of the toy, whereby rocking or oscillating actuation of the head by the child is effective to cause pivotal movement of the legs in a realistic manner.

An additional object of the present invention is to provide a walking four legged toy animal having operating parts of basically simple construction, so as to facilitate the manufacture and distribution of a toy of this type within a popular selling price range to assure wide distribution thereof.

All of the foregoing and still further objects and advantages of this invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing, wherein:

FIGURE 1 is a side view, with parts broken away, of a walking four legged toy animal made in accordance with the present invention;

FIGURE 2 is a side elevational view of the head member and parts of the operative mechanism actuated thereby, forming a part of the present invention;

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 1;

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1, with parts omitted;

FIGURE 5 is a sectional view taken along line 5—5 of FIGURE 1, with parts omitted;

FIGURE 6 is a fragmentary enlarged longitudinal vertical sectional view of the toy animal, with the springs supporting the front legs omitted;

FIGURE 7 is a sectional view taken along line 7—7 of FIGURE 1;

FIGURE 8 is an enlarged side elevational view of a modification showing a spring mechanism for driving the toy;

FIGURE 9 is a top plan view of a cam drum forming a part of the present invention;

FIGURE 10 is a rectification of the surface of the cam drum shown in FIGURE 9;

FIGURE 11 is a side view of the cam drum of the present invention with connecting links and associated followers in engagement therewith;

FIGURE 12 is a view taken at right angles to FIG. 11 showing in section the operating links of the rear legs of the toy animal and illustrating the manner in which the pins on the linkage ride in the grooves of the cam drum;

FIGURE 13 is a view similar to FIGURE 11 showing the drum in a partly rotated position from the position shown in FIGURE 11; and

FIGURE 14 is a view similar to FIGURE 12 but showing the pins on the operating links of the four legs of the

device in their respective cam grooves in accordance with their positions shown in FIGURE 13.

Referring now to the drawing, and more particularly to FIGURES 1 to 7 thereof, a walking four legged toy animal 20 made in accordance with the present invention, is shown to be in the form of a horse having a main body 22, a head, and fore and hind legs 62, all hingedly mounted together in a manner hereinafter more fully described.

The front end of the main body member 22 is provided with an upwardly opening slot 24 within which a depending tongue 26 on the simulated head 28 is slidably positioned. The tongue 26 is pivotally mounted on a transverse shaft 30 extending across the front end of the main body member 22 and rotatably extends through an opening 32 in the tongue 26. The lower end of the tongue 26 is provided with a pivot pin 34 that pivotally supports one end of a link 36 having its opposite end pivotally mounted upon the throw 38 of a crank shaft 40 having a grooved cam drum 42 axially mounted on and rigid therewith. The upper end of the crank shaft 40 is rotatably mounted within a bearing portion 41 in the central portion of the main body member 22.

As is more clearly shown in FIGURES 9 through 14, the cam drum 42 is provided with three vertically spaced discrete grooves 44, 46, 48, each of which performs a required function in the articulated movements of the legs of the toy.

Four longitudinally extending bars 50 are provided, two at the front and two at the rear of the main body member 22, each being pivotally secured at one end by a pin 52 to the body 22 and having on the outer end a follower pin or projection 54 slidably received within the uppermost groove 44 of the cam drum 42. The bars 50 are in engagement with the uppermost end of an arcuate bearing plate 60 on each leg 62 of the simulated animal. Each bearing plate 60, together with an exterior face plate 64 of each leg 62 constitutes an upper extremity U-shaped in cross-section which defines an upwardly opening socket 66 within which the depending mounting plate 68 of the respective fore and hind leg sections of the main body member 22 are received, thus providing a sliding type connection between the legs 62 and main body member 22 to restrict the legs to pivotal movement in a vertical plane. The weight of the main body member 22 and any load supported thereupon is transmitted directly to the bearing plate 60 of each leg 62 through the constant engagement of the bar 50 and bearing plate 60, respectively, of each leg, the arcuate plate 60 rolling or riding on the underside of the bar 50 during oscillating movement of the leg. Each bearing plate 60 is further provided with an inwardly extending mounting lug 70 which cooperates with a corresponding mounting lug 72 on the main body member 22 to secure a tension spring 74 therebetween for each leg, each such tension spring maintaining an upward force upon each leg 62 to maintain the arcuate plate 60 in constant rolling contact with the bar 50 including when the leg rises above the ground.

Each bearing plate 60 of each leg is further provided with an extension arm 76 having a follower pin or projection 78. The followers 78 of the front pair of legs 62 are slidably received within the lowermost one 48 of the grooves in the cam drum 42, while the follower pins 78 of the rear pair of legs 62 are slidably received within the intermediate groove 46 of the cam drum 42.

With references, now to FIGURES 6, 9 and 10, it will be noted that as the cam drum 42 is rotated, the follower pins 78 of the front legs 62 riding in the lower groove 48 of the cam drum will cause the front legs to move rearwardly as the bearing pins 78 of the rear legs 62 riding in the intermediate groove 46 cause the rear legs 62 to

move forwardly. However, since the bearing pins **78** of the front legs engage at diametrically opposite sides of the cam drum, one front leg will move forwardly while the other moves rearwardly. Similarly, the diametrically opposite engagement of the follower pins **78** of the rear legs with the intermediate slot **46** of the cam drum necessarily requires that one of the rear legs be disposed forwardly while the other thereof is disposed rearwardly. As a result, at any given moment, one fore leg and the diagonally opposite hind leg will move forwardly, whereas the other fore leg and its diagonally opposite hind leg will move rearwardly, all on a realistic manner.

It will be noted, FIGURE 10, that the uppermost groove **44** of the cam drum is continuous through three quadrants D, C and B in a horizontal plane, except for the fourth or terminal quadrant A as shown at **44'** which is in the form of an inverted V-shape. Also, the intermediate groove **46** is inclined throughout the first three quadrants D, C, and B in one direction, except for an oppositely inclined fourth quadrant A, indicated at **46'** which coincides with the terminal portion **44'** of the upper groove and the oppositely inclined portion **48'** of the lower groove **48** which is inclined throughout the first three quadrants D, C and B in a direction opposite to that of the intermediate groove **46**. This change in slope of the intermediate groove **46** and lower groove **48** causes the leg of the follower pin **78** in engagement therewith to be rapidly returned to its forward position after its driving rearward movement over a great length of time, represented by the extended length of the major portion of each such groove, that is, over three quadrants D, C and B. Simultaneously with such return forward movement of each leg, the inverted V-shaped terminal portion **44'** of the upper groove **44** allows the respective bar **50** to pivot upwardly about its mounting pin **52**, thus allowing the respective spring **74** to lift such leg **62** from the ground as it is returned to its forward position and hence relieving such leg from carrying a part of the weight of the main body **22** during such return movement, also in a realistic manner. The lifting of each leg during its return forward movement also enables the animal to "step over" small obstacles lying in its path of movement.

In the present invention, the child sitting upon the main body **22** of the animal simply exerts a back and forth pulling and pushing movement upon the handle **29** of the simulated head **28**, so that the link **36** will rotate the cam drum **42** through the medium of the crank shaft **40**, thus causing the driving and return movement of the legs in the aforementioned manner. In the arrangement shown in FIGURE 8, a spring mechanism **80** is shown to have a winding key **82**, a spring **84**, and a gear train **86** for effecting rotation of the cam drum **42** to replace the manual operation of the device through the handle **29**. This device **80** may be used in the smaller type toys which are not to be mounted by the child, but which are simply to be observed as they are moved along a supporting surface. The winding key **82** may extend downwardly beneath the main body member **22** to facilitate the winding thereof.

In the drawing the bars **50** are shown provided with downwardly extending teeth **56** and the arcuate plates **60** which ride on the bars are shown with upwardly extending teeth **58** meshing with the teeth **56**. Although the plate **60** will properly ride on the bar without the mutually engaging teeth it is advisable that the teeth or an equivalent interengaging means, not shown, be provided to prevent accidental movement of any leg, as by a sharp blow thereagainst tending to swing that leg alone. Such a blow would tend to force the pin **78** of the leg up or down either out of its groove or tending to break the pin off. With the provision of the teeth **56**, **58** such force is taken up by the teeth, which are better able to resist it without breaking.

While this invention has been described with particular reference to the construction shown in the drawing, it is to be understood that such is not to be construed as imparting limitations upon the invention, which is best defined by the claims appended hereto.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A walking four legged toy animal comprising a substantially rigid hollow main body having a vertical longitudinal slot in the forward portion thereof, a pair of fore legs and a pair of hind legs, a simulated animal head having a depending tongue slidably mounted in said slot and pivotally mounted on a transverse horizontal axis in said body, means partly on the upper ends of said legs and partly on said body jointedly securing the legs to the body, said means including depending flat vertical mounting plates extending from the four corners of said body, said means further including a U-shaped upper extremity on each of said legs consisting of a pair of spaced parallel vertical plates defining an upwardly opening socket therebetween slidably receiving one of the mounting plates therein whence one of the last-named plates is positioned inward with respect to said body and the other thereof is positioned on the outside of the body, said one of said last-named plates having an arcuately rounded upper edge, said means further including four substantially horizontal bars secured in the four corners of the body above and in the planes of said last-named plates with said last-named plates in rolling contact with the undersides of said bars, link means carried by each of said legs for imparting jointed oscillating movement to the legs, a motion control device synchronizing the actuation of said link means, motion transmitting means connected between said tongue and said device for imparting motion to said device upon manual rocking of said head, said first-named means further including spring means acting between said legs and said body maintaining said rounded upper edges in constant contact with said bars.

2. A toy animal as set forth in claim 1, said rounded upper edges having spaced gear teeth thereon, said undersides of said bars having complementary spaced teeth thereon in mesh with said gear teeth.

3. A toy animal as set forth in claim 1, wherein said link means comprises an arm connection integral with each said leg having a follower pin in driven engagement with said motion control device, whereby actuation of said motion control device is operative to control movement of each said leg through said respective follower pin and arm connection, one end of each of said bars being pivoted to said body, the opposite end of each of said bars being in engagement with and positioned by said motion control device to control the level of each respective leg above the supporting surface upon which the toy rests.

4. A toy animal as set forth in claim 3, wherein said motion control device comprises a cam drum rotatably supported within the interior central portion of said main body member for ortation about a vertical axis, said cam drum including three vertically spaced cam grooves, said opposite end of each said bars including a follower pin in sliding engagement with the uppermost one of said cam grooves, said follower pins of said fore legs being in slidable engagement with the lowermost one of said cam grooves, and said follower pins of said hind legs being in slidable engagement with the intermediate one of said cam grooves, all of said cam grooves being angularly related with respect to each other to sequentially control the jointed movement of each one of said legs.

5. A toy animal as set forth in claim 4, wherein said motion transmitting means connected between said head and said motion control device comprises a crank shaft carried by said cam drum rotatably supporting said cam drum for rotation about said vertical axis, said crank shaft

having a throw, said tongue having a pivot bearing, and a link pivotally connected between said pivot bearing of said tongue and said throw of said crank shaft for effecting rotation of said drum in response to said rocking of said head about said horizontal axis.

6. A toy animal as set forth in claim 5, further comprising a handle carried by said head for manually effecting said rocking of said head.

References Cited in the file of this patent

UNITED STATES PATENTS

1,311,553	Criest	July 29, 1919
1,512,972	Zsarnay	Oct. 28, 1924
1,538,140	Spelling	May 19, 1925
2,226,893	Bennett	Dec. 31, 1940
2,712,937	Bell	July 12, 1955